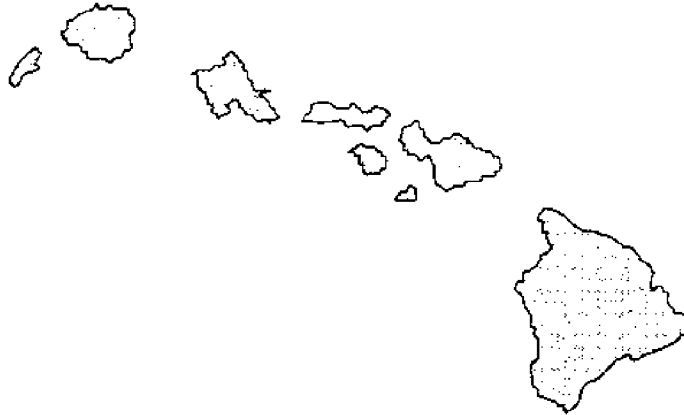




Hawaii's Readiness to Prevent and Respond to Oil Spills



SUMMARY & RECOMMENDATIONS

October 1996

Prepared for
Department of Health
State of Hawaii

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INTRODUCTION

The *Exxon Valdez* oil spill in Prince William Sound, Alaska, like the other disasters that are identified by their name alone, not only impacted the surrounding environment but permanently changed the way oil spills are regulated in the United States. There had been an ongoing debate concerning legislation dealing with oil spills long before the *Exxon Valdez* disaster. Indeed, oil spills began working their way into the public's consciousness and legislative forums shortly after the wreck of the *Torrey Canyon* near the coast of England in 1967 and after the blowout of an offshore oil well near Santa Barbara, California, in 1969. The *Exxon Valdez* oil spill, however, proved to be a seminal event. After the oil spill and the subsequent passage of the Oil Pollution Act of 1990 (OPA 90) a new oil spill management regime was created to prevent oil spills and to respond to those that occur in a timely manner so as to minimize damage.

The University of Hawaii Sea Grant College Program examined the impact of a catastrophic oil spill on Hawaii's economy and estimated that losses would total as much as \$6.8 billion if crude oil reached the beach at Waikiki (Pfund 1992). Among the recommendations made in the 1992 Sea Grant report, *Oil Spills at Sea: Potential Impacts on Hawaii*, were that the state should expend more effort preventing oil spills from occurring and define the roles of state agencies in managing oil spills.

In 1994, the Hazard Evaluation and Emergency Response (HEER) office of the State Department of Health asked the UH Sea Grant Extension Service to conduct a follow-up to the 1992 report that focused on the state's responsibilities for improving its oil spill prevention and response capabilities. Specifically, HEER requested Sea Grant to undertake the following five tasks:

Task 1: Assessment of Responsibilities

Define specific leadership responsibilities in the planning, prevention, preparedness, response and cleanup for state, county, federal and other oil spill related agencies.

Task 2: Assessment of Capabilities

Evaluate the state's capability for carrying out its legal and implied responsibilities for oil release planning, preparation, prevention, response and cleanup.

Task 3: Oil Spill Prevention and Mitigation: Methods, Activities and Safeguards

Define additional activities or safeguards the state may implement to legislate, train, prevent, mitigate, or consolidate leadership responsibilities with other parties in preparation for responding to an oil spill.

Task 4: Program Development

Make recommendations for improvements in the current program, using other state programs as examples.

Task 5: Review Hawaii's Oil and Hazardous Substance Emergency Plan

Identify deficiencies pertaining to oil spills and propose amendments.

Elements of the Sea Grant Study

In response to HEER's request, the Sea Grant Extension Service designed and conducted a year-long study to assist the state in determining how to prevent and respond to oil spills. The study included the following eight elements:

1. **Literature search of existing and emerging technologies and policies for oil spill prevention, mitigation and safeguards**

Since the *Exxon Valdez* incident, a wealth of information has been published concerning oil spill prevention and mitigation. Many publications, however, fall into the area of "gray literature" (report literature) which is characteristically harder to find.

2. **Review of applicable laws, regulations and plans**

Determine the legal responsibility of all parties involved in oil spill planning, prevention, preparedness, response and cleanup. Applicable laws, regulations and plans included, but were not limited to, OPA 90, Coast Guard Regulations, Hawaii Revised Statutes, Administrative Rules of the State Department of Health, State Department of Land and Natural Resources, Civil Defense, and other related state and county

agencies; all federal and state oil spill response plans; and memoranda of agreements on the subject of oil spills.

3. **Evaluation of the capabilities of the above cited agencies to respond to an oil spill emergency**
Sea Grant identified two oil spill response and prevention experts and brought them together in Hawaii. They evaluated current conditions and prepared a draft report of their findings.
4. **Survey of state oil spill prevention and mitigation practices**
Since the *Exxon Valdez* oil spill, many states have created oil spill prevention and response offices within the state and local government. A survey questionnaire was prepared and sent to the officials who staff these offices to determine what policies and practices their states have implemented for spill prevention and mitigation.
5. **Review of information regarding existing interstate compacts related to oil spill management**
Efforts were made to evaluate the potential feasibility and utility of the state to enter into a compact with other states.
6. **Review of non-tank vessels**
Determine their potential for causing a spill or paying for cleanup caused by fuel spillage.
7. **Interviews with oil industry officials, public interest groups, and federal, state and county officials**
Determine perceived responsibilities of the various planning and response agencies.
8. **Review of the existing state Oil and Hazardous Substance Emergency Response Plan**
Experts in oil spill management reviewed the state's present response capabilities.

Structure of the Report

Each of the study elements was investigated by one of five researchers or groups of researchers. Their results are reported in the five appendices listed below:

1. *Review of Current Literature on Oil Spill Prevention, Response and Policy*, by Peter J. Rappa.
2. *The Legal Authorities and Responsibilities*, by David Kimo Frankel.
3. *Analysis of States' Oil Spill Management Programs*, by Jacquelin N. Miller, Andrew S. Tomlinson and Heather D. Keevill.
4. *Evaluation of Spill Prevention and Response Preparedness in Hawaii*, by Rick Steiner and Richard Townsend.
5. *Nontanker Marine Vessels in Hawaii: Considerations Regarding the Oil Pollution Act of 1990*, by Noel A. Ludwig.

Each appendix was prepared and circulated for review prior to publication. However, the responsibility for content and recommendations is solely the authors. The appendices are being published under a separate cover.

In preparing the summary, the authors reviewed, evaluated and synthesized information, recommendations and rationales presented in the appendices. In addition, they also considered comments and suggestions received from reviewers, interviews with state and federal agencies, oil spill response contractors and industry representatives, as well as additional sources of information gathered after the completion of the appendices.

The criteria used to determine which recommendations proposed in the appendices would be included in the summary were: 1) its contribution to better oil spill management, and 2) its potential for implementation. Cost was not a consideration in screening the recommendations since it would have been difficult to determine in many cases and it would not have been meaningful without some estimate of projected benefits. A cost/benefit analysis was beyond the scope of this study.

Interviews of Spill Management Personnel

For the preparation of this summary and the five appendices oil spill management personnel were interviewed. The interviews occurred throughout the preparation of this study, primarily from October to December 1994. Oil spill management personnel and other knowledgeable sources interviewed included:

Name	Organization
Dave Hoffman	BHP, Inc.
Robbie Rath	BHP, Inc.
Randy Pinetti	Chevron Oil Company
Joe Robison	Chevron Oil Company
Gordon Robson	Chevron Oil Company
Kim Beasley	Clean Islands Council
Bruce Anderson	State Department of Health
Keith Ahue	State Department of Land & Natural Resources
Francis Oishi	State Department of Land & Natural Resources
David Parsons	State Department of Land & Natural Resources
Henry Sakuda	State Department of Land & Natural Resources
Barry Kim	State Department of Transportation
Harry Nakaji	State Department of Transportation
August Perry	State Department of Transportation
Steve Baker	Hawaii Pilots Association
Ed Enos	Hawaii Pilots Association
Dave Lyman	Hawaii Pilots Association
Steve Armann	HEER Office
Chris Takeno	HEER Office
Gordon Smith	Marine Logistics
Tim Coonse	Marine Spill Response Corporation
Anita Miller	Marine Spill Response Corporation
Barry Ogilby	Marine Spill Response Corporation
Skip Onstad	Marine Spill Response Corporation
John Naughton	National Marine Fisheries Services
Rusty Nall	PENCO
Rose Pfund	UH Sea Grant College Program
Roy Price	State Civil Defense
Ken Hiraki	Hawaii State Legislature
Jim Shon	Hawaii State Legislature
Capt. Sam Burton	U.S. Coast Guard Marine Safety Office
Commander Brian Conway	U.S. Coast Guard Marine Safety Office
Lt. Commander Kenneth Hertzler	U.S. Coast Guard Marine Safety Office
Lt. Commander Neil Hurley	U.S. Coast Guard Marine Safety Office
Commander Marvin Pontiff	U.S. Coast Guard Marine Safety Office

Acknowledgments

We gratefully acknowledge and appreciate the assistance and contribution of each informant and reviewer. Without their help we would not have completed the study. However, participation in this study and review of this summary and any of the appendices should not imply agreement with the recommendations proposed herein. Many of our reviewers were in agreement with some recommendations. However, some reviewers strongly disagreed with a number of recommendations, especially those concerning the states' involvement in ship and plant inspections, random surveillance of incoming vessels, interpretations of a worst case scenario and others. We respect their right to disagree with the study's findings and conclusions. Any discussion, analysis or recommendation herein are solely the responsibility of the authors.

ROLE OF FEDERAL, STATE AND COUNTY AGENCIES

Federal Authority

The federal government has the ultimate authority in response actions to actual or threatened oil spills into any body of water, adjoining shorelines, and natural resources belonging to, appertaining to, or under the exclusive management of the federal government, including those from underground storage tanks. Congress has exercised its authority by enacting the Federal Water Pollution Control Act, the Oil Pollution Act of 1990, the underground storage tank provisions of the Solid Waste Disposal Act, and the Safe Drinking Water Act. In addition, federal agencies have enacted rules to reduce the risk of oil spills. For example, the Department of Labor promulgated Occupational Safety and Health Standards, and the Department of Transportation promulgated Oil Transportation and Hazardous Material Regulations.

Many of these acts do not preempt the ability of state and local governments from enacting stricter standards. Generally, state and local governments may enact additional requirements so long as they do not conflict with federal requirements (Pacific Gas 1983). The Oil Pollution Act specifically provides that the states retain the authority to impose additional requirements with respect to any removal activities in connection with a discharge (see 33 USC § 2718). Nor does it appear to preempt state and local governments from implementing prevention programs. The Federal Water Pollution Control Act allows states to impose additional requirements in cleaning up oil spills (see 33 USC § 1321 [o]). The underground storage tank provisions of the Solid Waste Disposal Act likewise guarantee the states the ability to enact more stringent requirements (see 42 USC § 6991g).

Federal authority to respond to oil spills is shared by the U.S. Environmental Protection Agency (USEPA or EPA) and the U.S. Coast Guard (USCG). The EPA is delegated the authority over events, facilities and activities for the "inland zone," and the Coast Guard for the "coastal zone" by Presidential Executive Order 12777. The "coastal zone" includes all tidal waters and the "land surface, land substrata, ground waters, and ambient air proximal to those waters." "Inland zone" means the environment inland of the coastal zone. In the State of Hawaii, the Coast Guard has the additional duty to respond to all inland oil spills on behalf of the EPA until such time as the EPA sends personnel from their Region IX headquarters in San Francisco.

Responsibilities of State Agencies

Both the Oceania Regional Contingency Plan (March 30, 1994 Draft, A-8) and the State of Hawaii Oil and Hazardous Substances Emergency Response Plan, a supplement to Volume III of the State of Hawaii Plan for Emergency Preparedness: Disaster Response and Assistance (p. 12) state that the Coast Guard will be the lead agency, incident commander, and first responder to oil spills threatening or occurring in navigable waters. Nevertheless, state agencies continue to play a role (although a subordinate one) in prevention and response to oil spills.

The State Departments of Defense, Health, Transportation and Land and Natural Resources each share some responsibility for preventing and responding to oil spills. Other agencies may be peripherally involved, but these four agencies are the most important.

State Department of Defense

The Department of Defense houses the State Civil Defense Division and the National Guard, both of which may be utilized during an oil spill. Traditionally, the Department of Defense's (DOD) responsibility was to defend the state and its people from "mass violence, originating from either human or natural causes" according to Hawaii Revised Statutes (HRS) section 26-21. The DOD's civil defense responsibilities were limited to responding to enemy attack (see HRS § 128-2) and actions to "minimize and repair injury and damage resulting from disasters caused by fire, flood, tidal wave, volcanic eruption, earthquake, or other natural causes" (see HRS § 127-10).

In 1971 the State Legislature expanded the authority of the director of the Civil Defense Division to include preparation for, and response to, man-made disasters, such as "massive oil spills" (see HRS § 127-10).

The governor is authorized to use the National Guard in the event of an oil spill. All provisions of law relating to disasters from enemy attack are applicable to massive oil spills (see HRS § 127-10). The governor is authorized, in responding to an oil spill, to order the National Guard into disaster relief service (see HRS § 121-30).

State Department of Health

In 1988 the State Legislature gave the Department of Health (DOH) similar authority to respond to oil spills by enacting the Environmental Emergency Response Law – the state counterpart to the federal Comprehensive Environmental Response, Compensation and Liability Act (Hawaii Legislature 1988). This specific authority was made more explicit with the passage of the amended Environmental Response Law in 1991 (Hawaii Legislature 1991). In 1993 the legislature authorized DOH to spend funds on oil spill planning, prevention, and preparedness (Hawaii Legislature 1993). The Environmental Response Law also gives the department the authority to adopt rules to implement the chapter. DOH could use this authority to require that vessels or facilities implement prevention strategies.¹

The Environmental Response Law is not the only statute that gives DOH the authority to address oil spills (see HRS §§ 342D-10 and 342L-9). The state's water pollution chapter authorizes the DOH director to adopt rules to prevent water pollution, including oil spills (see HRS § 342D-4). The state's used oil chapter authorizes the DOH director to take any action to reduce or stop a discharge of new, used, or recycled oil that poses an imminent threat to public health and safety, including ordering any person to stop the discharge (see HRS § 342N-7). Similarly, the director can take such actions necessary to protect public health when an oil spill is likely to contaminate drinking water (HRS § 340E-4).

DOH has been designated the state's natural resources trustee.² The trustee consults with response officials to minimize damage to natural resources during response activities. The trustee also assesses the damages to the state's natural resources, recovers costs, and implements a restoration or replacement program (see 33 USC § 2706 [c]).

DOH will play a major role in regulating the disposal of the cleaned-up oil and used oil spill equipment. Transportation of used oil requires a DOH permit (see HRS § 342N-32). DOH enforces the used oil statute which prohibits disposing used oil onto the ground, including dumping into landfills (see HRS § 342N-30).

The DOH has been assigned by the governor to represent the state in matters dealing with the Regional Response Team (RRT) and the regional and area contingency plans. In addition the deputy director of health chairs the Regional Response Team and co-chairs the Area Planning Committee which are responsible for guiding the development of the regional and area contingency plans.

As the state's representative to the RRT, the Department of Health carries out the tasks assigned by federal regulations which include these provisions:

- Plan for, make available and coordinate state resources
- Serve as a contact point for coordination of response with local government agencies
- Appraise the State Emergency Response Commission of RRT activities
- Involve local government agencies in the response planning when appropriate

¹ The State Department of Transportation and State Department of Land and Natural Resources also have this power in and around harbors and boating facilities.

² The governor designates the state trustee. No such designation is found in any executive order, administrative directive or memorandum. Reference to the designation is found in the Oceania Regional Contingency Plan (March 30, 1994 Draft, A-8) E-10.

Within the DOH, the Hazard Evaluation and Emergency Response (HEER) office has been assigned the task of acting on behalf of the department. The HEER office has the responsibility for responding to releases of hazardous materials as well as oil. Within the HEER office, one staff person and the acting manager are involved with oil spill management on a daily basis.

State Department of Transportation

The State Department of Transportation (DOT) is authorized to prevent oil spills in commercial harbors and during transport. DOT's Harbors Division exercises control over commercial harbors.³ The DOT director is empowered to adopt rules to "prevent the escape of fuel or other oils or substances into the waters in, near, or affecting commercial harbors from any source point, including, but not limited to, any vessel or pipes or storage tanks upon the land (see HRS § 266-3[b] [3]). Pursuant to this authority, DOT has promulgated a number of rules (see Hawaii Administrative Rules [HAR] § 19-42-106).

In order to prevent spills DOT regulates the transport of oil, a "hazardous material" (see 49 CFR Subchapter B). The department is required to annually adopt the hazardous material regulations established by the U.S. Department of Transportation (see HRS § 286-222 [b]).

State Department of Land and Natural Resources

In 1991 the State Legislature charged the Department of Land and Natural Resources (DLNR) with the authority to develop rules "to prevent the escape of fuel or other oils or substances into the waters in, near, or affecting small boat harbors, launching ramps, or other boating facilities and the ocean waters and navigable streams of the state from any source point, including, but not limited to, any vessel or from pipes or storage tanks upon land" (see HRS § 200-4[6]).

In addition, DLNR may become involved in an oil spill response. It manages and administers the state's wildlife and wildlife resources which would be affected by an oil spill (see HRS § 183-2). DLNR also manages, administers, and exercises control over the public lands, water resources, ocean waters, navigable streams, and coastal areas (excluding commercial harbor areas) which may be affected by an oil spill (see HRS § 171-3).

Several of the statutes and rules DLNR enforces could affect oil spill response activities. Cleaning up an oil spill may require the removal of oil-coated sand and coral. DLNR enforces a statute which prohibits removal of sand and coral from the shoreline ("provided that the sand removed [for cleaning purposes] shall be placed on adjacent areas unless such placement would result in significant turbidity" HRS § 171-58.5). Its administrative rules also prohibit the removal of sand, earth, rocks, or coral from public lands (see HAR § 13-221-23). Use of motor vehicles to get to a shoreline spill site not near a road may be constrained by HAR § 13-221-26, which prohibits off-road uses on public land.

County Agencies

Generally, the counties do not maintain an oil spill response posture, but they may be the first responder through the fire department hazardous materials (HAZMAT) teams. The fire department (or other county first responder) may act as the incident commander until either 1) state or federal agencies take control, or 2) upon completion of stabilization and control measures (prior to cleanup and restoration). However, if the county civil defense is coordinating the response, DOH may not be able to take over control of the operation without the approval of the county or authorization of state civil defense or the governor. The counties provide support through the civil defense system as well.

³ In 1991 the State Legislature delegated the responsibility for administering other ocean areas, such as small boat harbors, to the State Department of Land and Natural Resources (see HRS § 266-2).

Other county agencies, including police, public works, and parks departments, have roles to play in oil spill management. Police may be called on to close off contaminated areas or to evacuate impacted areas. The Parks and Recreation department manages the beaches that would have to be evacuated during an oil spill in nearby coastal waters or be used as staging areas during oil spill response. Public works may be called upon to remove and dispose of oily debris gathered during a response to an oil spill. Each of these agencies should be brought into the planning process at the Area Contingency Planning level. These agencies should regularly participate in scheduled drills.

Primary State Responsibility of Oil Spill Management

The State DOD Civil Defense Division and the Department of Health share the primary state responsibility for responding to oil spills, with the Civil Defense Division generally deferring to the Department of Health. Other agencies are charged with helping to prevent spills and may be involved in response activities. The DOD's authority, however, appears to be paramount. The primacy of DOD through its civil defense agency is found in HRS Chapter 128.

Unless otherwise directed by the governor, all of the powers pertaining to civil defense, hereby authorized to be delegated by the governor shall be deemed to have been delegated by the governor to the director of civil defense, with the further authority to subdelegate the powers to any agency or person to whom the governor could delegate these powers (HRS § 128-5).

Thus, should a natural disaster or enemy attack cause an oil spill, or should a massive oil spill occur for other reasons, the Civil Defense Division is authorized to take the lead. Civil Defense appears to have delegated some of its authority to respond to oil spills back to DOH, through the State of Hawaii Plan for Emergency Preparedness, Volume III, Disaster Response and Assistance, which attempts to spell out the role of various government agencies. This plan identifies the roles and responsibilities of government agencies and private organizations responding to disasters and major emergencies, including oil and hazardous materials. It established the emergency response infrastructure and describes the coordination required and emergency communication systems available that may be used in a disaster situation. The organizational responsibilities avoid duplication and assure a prompt and effective response for all hazards, including oil and hazardous material emergencies. The Hawaii civil defense system includes county and state civil defense organizations, federal and other government agencies, and private nonprofit groups who assist in disaster relief. The Department of Health, Department of Defense, and the State Civil Defense Division have coordinated plans to preclude duplication of an emergency response, communications, and data infrastructure beyond that absolutely necessary. The State Civil Defense Division coordinates and schedules all hazardous material training and exercises. Federal agencies may also provide significant assistance in oil spills and hazardous substance releases.

The *Oil and Hazardous Substances Emergency Response Plan* (HSERC 1992) provides an overview which lists the responsibilities of county, state and federal agencies, private industry and volunteer organizations, and a matrix of agency responsibilities for chemical and oil emergency response. More detailed, specific responsibilities are provided in subsequent sections.

In most spills, DOH serves as the on-scene coordinator, supports first responders, performs emergency mitigation, cleanup activities and damage assessment, coordinates resources, provides technical assistance, ensures cleanup is done to specified standards, and enforces the law. Within the DOH, the HEER office has filled the role as the state's first responder to oil spills.

The major part of the collaborative effort in oil spill management appears to be spent on oil spill response. There is some logic to this. Oil spill response, especially to large spills, requires the coordination of many different players who must perform their role in a timely manner. This coordination requires a high degree of planning and drilling which take place under the management regime set out by OPA 90.

The HEER office, as the state's representative to the regional and area planning committees must understand the role that each party plays in the oil spill management regime. Other parties involved, including

the U.S. Coast Guard, the oil industry, spill contractors, and other federal agencies, should feel confident that the state will perform its task well. To that end, HEER should be an active participant in the various management activities that take place. In addition, the HEER office should also encourage participation by other state and county agencies in the response process. County agencies such as Parks and Recreation, Police Department, Fire Department and Public Works, and state agencies such as Harbors, Division of Boating and Ocean Recreation, Parks, and Division of Aquatic Resources should be regular participants in practice exercises. The HEER office should meet with these agencies at least annually to clarify each agency's role.

Maintaining the state's current level of prevention and response capabilities is another important responsibility of the DOH. In the aftermath of the Prince William Sound oil spill, it was discovered that many of the safeguards that Alyeska, the company that managed the oil terminal, were supposed to have in place did not exist or were inoperable at the time of the spill (Keeble 1991). Of more interest is the fact that the state of Alaska had allowed Alyeska's response capability to decline even though the state, through its Department of Environmental Conservation, had the responsibility of monitoring Alyeska's compliance with that company's response plans. The underlying causes for the decline in response capability at the Alyeska terminal were fiscal constraints and complacency (Keeble 1991).

Could a similar scenario happen in Hawaii? Much of Hawaii's prevention and response capabilities rest with organizations that are externally controlled. The Coast Guard, the lead agency for both oil spill prevention, response, and planning, is part of the federal government. Their level of participation, the number of personnel assigned the tasks given them by Congress through OPA 90 can change because of budget considerations or new priorities. The industry co-ops that provide much of the equipment for oil spill response could shrink the size of their participation in protecting the state from the impacts of oil spills.

The state cannot necessarily prevent the Coast Guard from reallocating resources or industry co-ops from downsizing or relocating, but they must be aware if this occurs. The state, by keeping abreast of the situation, may be able to find alternative means of maintaining prevention and response capabilities or may step in to undertake tasks themselves. The only way for the state to monitor the situation is to assign an agency to be involved in all aspects of the prevention and response program. This task should be assigned to the HEER office. They are already involved in the OPA 90 planning process and they should be involved with all aspects of the prevention and response capabilities of the state, including vessel and facilities inspection, bunkering and cargo off-loading, and other related aspects.

Additional Responsibilities for State Agencies

In addition to the tasks assigned to departments by federal and state legislation, there are a number of tasks that state agencies can undertake to improve oil spill management:

- Designate a lead advocate for oil spill prevention
- Set response standards for the state
- Prevent oil spills from recreational and fishing vessels
- Institute a process for the natural resource damage assessment
- Increase the capabilities of county responders
- Protect against oil spills during bunkering
- Inspect of fishing, barge and tow vessels
- Plan for handling wildlife in the event of an oil spill

Designating a Lead Advocate for Oil Spill Prevention

While preparing to respond to oil spills is clearly in the state's interest, prevention is the key to protecting the environment, economy and society from the damage done by spills. However, the majority of oil spill management efforts in this state go into response. Oil spill prevention, as one industry representative explained, is a combination of individual actions taken by people involved in the handling of petroleum

products to assure that they do not get into the environment. It cannot be achieved by a collaborative planning process. While there is some truth in that statement, we believe much can be gained by working through a collaborative planning process for oil spill prevention. The HEER office, as the lead oil spill agency within the DOH, can take the lead in getting the state's oil spill management apparatus more involved in preventing oil spills. They may suggest, for example, that the state DOT examine bunkering procedures inside and outside Hawaii's commercial harbors to determine if there are better ways to dispense fuel.

Outside the state's oil spill management regime, which tends to focus on larger sized spills, there is more opportunity for preventing oil from entering the environment. Many oil spills occur in the state's recreational boat harbors by mishandling fuel and by discarding petroleum products in the water. The HEER office could work together with Division of Boating and Outdoor Recreation (DOBOR) to take steps to educate boaters about releasing petroleum products in the marine environment. Poorly maintained commercial vessels are a potential source of oil spills. The HEER office might work with the state's Division of Aquatic Resources (DAR), the Coast Guard and perhaps the insurance industry to see that vessels carrying a substantial amount of fuel are properly maintained and that the crew know what they are supposed to do in the event of a spill. The HEER office should work to increase the number of sites where waste oil can be dropped off for recycling.

Setting Response Standards for the State

How quickly contractors, cited by vessel and facility owners in their response plan, must respond to an oil spill is a concern for the state. The Coast Guard sets minimum standards for response time to facility and vessel oil spills that oil spill removal organizations (OSRO) must meet. The Coast Guard based their response time requirements on the amount of vessel traffic in the ports and terminals. According to the Coast Guard's *Guidelines for Classifying Oil Spill Removal Organizations*, response capabilities would have to be deployed within 12 hours of a vessel's most probable maximum discharge for higher volume port areas and 24 hours for all other ports. Hawaii is not considered a high volume area and so the response standard is 24 hours for all discharges in Hawaiian waters.

The first 24 to 48 hours after a spill are the most critical in terms of controlling it. The Coast Guard OSRO standard may allow too much time to pass before a response to a large spill is organized. If a large spill were to occur it would make little difference whether the state's harbors are high volume if an economically strategic area was threatened. The state has a vital interest in determining how fast OSRO contractors must respond to oil spills since Hawaii is so far from the mainland and most oil spill contractors. According to one local OSRO, "the only organizations that can respond in a timely manner are the CIC [Clean Islands Council] and the MSRC [Marine Spill Response Cooperation]" (Oil Spill 1995).

Response for neighbor islands is a concern for the state. Each of the harbors in the neighbor islands that regularly handle bulk oil receives shipments of oil in barges ranging in size from 30,000 to 67,000 barrels. Yet each has a very limited stock of oil spill response equipment, none of which is suitable for use in anything but the calmest waters.

While more robust equipment may be transported to the outer islands from Oahu and the mainland, it will take time to mobilize and transport it. It is doubtful that significant equipment, other than the CIC and MSRC vessels, could be transported from Oahu to Kahului or any other neighbor island port within less than 24 hours. However, sufficient resources are presently provided by CIC and MSRC to meet the OPA 90 planning standard for neighbor islands areas.

The state should insure that adequate response planning standards are developed to ensure that a meaningful response can be mounted within the first 24 to 48 hours after a spill at any of its port areas. This would mean that shippers or other responsible personnel would have to show that they have, or have access to, sufficient oil discharge containment, storage, transfer and cleanup equipment, personnel and other resources to begin the effective containment and recovery of a worst-case oil spill.

Preventing Oil Spills from Recreational and Fishing Vessels

The DLNR can play a role in preventing spills from recreational and fishing vessels. State recreational boat harbors are managed by DLNR's Division of Boating and Outdoor Recreation (DOBOR). DLNR has the authority to make regulations to prevent the escape of fuel in small boat harbors and related recreational facilities.

Fishing vessels are berthed in commercial harbors managed by the Department of Transportation. However, commercial fishermen must obtain a license to fish in Hawaii's waters from the DLNR's Division of Aquatic Resources (DAR). Vessel condition is not a criteria for granting or denying a commercial license, nor are commercial fishermen required to have any pollution insurance as a condition for obtaining a fishing license.

DLNR could be instrumental in educating boaters to the seriousness of fuel spill. They can instruct both recreational boaters and commercial fishermen how to prevent accidental fuel spills, and educate the boating public about what to do in the case of an oil spill.

Natural Resources Damage Assessment

Much of the state's natural resources are managed by the DLNR. In the event of a large oil spill, the DLNR would be a key participant in the Natural Resources Damage Assessment (NRDA). The NRDA process involves other state and federal agencies which have jurisdiction or information concerning the state's natural resources. How the NRDA process would be implemented, and who would be in charge of a large oil spill, are two issues that should concern DLNR staffers. DLNR should take on the role of planning the logistics of an assessment after a large spill.

Supporting County Responders

The first responders to oil spills are often the county fire department's HAZMAT teams. These teams sometimes lack the equipment to adequately stabilize the emergency situation (Price 1995 pers comm.). The state could use part of the environmental response fund to make equipment purchases for county responders. Oil spill response training could also be underwritten by the state for all first responders that may not have the appropriate training. First responders from neighbor islands should be brought to Oahu to participate in oil spill drills. Increasing the capabilities of first responders may help to prevent small scale disasters from becoming large scale.

Preventing Spills in Harbors and During Bunkering

The Department of Transportation has personnel at each of the commercial harbors. These people may detect the occurrence of an oil spill. They should be aware of the procedure for reporting oil spills and, with training, may act as a responder. This is especially crucial on the neighbor islands where few response personnel are stationed.

Vessels may bunker outside Honolulu Harbor. However, weather conditions impact bunkering outside the harbor far more than bunkering inside. The DOT can set conditions for safe bunkering on the outside anchorages.

Fishing Vessel and Tow Vessel Inspection

Neither fishing or tow vessels are inspected by the Coast Guard or the state. Oil transport barges and some fishing vessels can cause significant spills (10,000 gallons or more). Inspections of vessels' structural integrity could help prevent spills from fishing vessels and prevent accidents from occurring with barges. The DOT has the authority to require inspection of vessels home ported in the state's commercial harbors.

Planning for Cleaning Wildlife in the Event of an Oil Spill

There is little capacity for cleaning oiled animals in the event of an oil spill. Although the issue has been examined by the area committee, no permanent solution has been determined. The State Department of

Land and Natural Resources is charged with protecting Hawaii's wildlife and should take the lead role in determining the appropriate level of treatment for oiled animals in the event of an oil spill. They should investigate what type of permanent facility, if any, should be established in Hawaii for this purpose.

Recommendations

Implementation of the following recommendations is necessary if the HEER office is to fulfill its role in oil spill management.

1. HEER personnel should become more involved in prevention activities that are already in place.

State DOH personnel in the HEER office should participate in existing facility and vessel inspection programs to become familiar with those procedures. The DOT, in cooperation with the oil industry and the Coast Guard, should develop stop conditions for offloading and bunkering in Hawaii's commercial harbors. The DOT should devise methods for inspecting the structural integrity of fishing vessels and oil transport barges that are berthed in Hawaii's commercial harbors. The DLNR should initiate an education campaign to inform recreational boaters and commercial fishermen of ways to avoid spilling fuel and what to do in the event fuel is spilled.

2. Increase the state's response capabilities.

The state in general should play a greater, cooperative role with the federal agencies in oil spill response. The HEER office should deal with requirements of on-land oil spill response and the regulation of facilities pursuant to OPA 90. The state should also periodically test its notification and response command structure with the federal agencies and other local agencies and departments. Specific personnel and their jobs should be identified in the state response plan and tested to verify that state and local personnel are aware of their responsibilities during an oil spill.

The state HEER office or Civil Defense should review vessel response plans prepared pursuant to OPA 90 and Spill Prevention, Containment and Countermeasures (SPCC) for oil facilities. The state should understand and know what each type of response plan contains to insure the state's interests are protected. Of special concern are arrangements for response contractors in the event of a major spill. The state should know that the contractor(s) named in these plans can meet their obligations to the federal response plan holders that have cited them in their required response plans.

The state HEER office should also work with the HAZMAT teams to upgrade the counties' response equipment and include neighbor island HAZMAT responders in oil spill training, drills, and exercises.

3. Expand the capability of the HEER office as the state's lead agency for oil spill prevention and response.

The DOH should expand the capability and number of people at the HEER office devoted to oil spill management. The state needs to develop a well trained, technically advanced staff of oil spill managers to plan, implement and coordinate oil spill management programs. Training should include regular participation in oil spill management conferences, exercises and training, which is currently being offered by industry, the USCG, and cooperatives, as well as with other state and federal oil spill managers. The DOH should offer competitive salaries to attract well qualified personnel who have dealt with oil transport, oil spill prevention, response and planning. The DOH may wish to hire contractors who could provide specific services to HEER, such as ship inspections and spill response equipment. Funding for the additional staff may come from a small percentage of the Emergency Response Revolving Fund to be used for administering the state's oil spill program.

Strengthening the state's oil spill management stance necessitates clarifying the role of the HEER office and the Civil Defense so as to eliminate any confusion during an oil spill emergency. HEER should be authorized to represent the state in all matters of oil spill management planning. In the event of an oil spill, HEER should function as the SOSC with Civil Defense providing logistical support, including command and communication systems, crowd control and evacuation procedures. In the event of a natural disaster,

which may also cause an oil spill, Civil Defense should be authorized to direct the state's resources to protect public safety.

4. HEER should consolidate recordkeeping within its office.

Knowing when, where, and what types of oil spills occur can be helpful in preventing future spills. Several states consolidate recordkeeping at the state level. Hawaii should do the same. The state should use part of the tax collected on oil to hire additional staff, if needed, to undertake a recordkeeping program.

5. The HEER office should fund the shoreline countermeasures survey and an update of sensitive area mapping.

Prearranged shoreline countermeasures can cut down the time required to respond to an oil spill. The Area Planning Committee (APC) has instituted a program of determining shoreline countermeasures along Oahu's coastline. The HEER office should take the lead on behalf of the APC in conducting shoreline countermeasures review of all important coastal areas throughout the main Hawaiian Islands. The HEER office should arrange for participation by federal, state, county and private agencies and pay any cost incurred as part of the shoreline surveys.

An essential part of determining countermeasures is knowing what areas need special protection. Accurate sensitivity maps are essential for predetermining what areas will need to be protected during an oil spill emergency. Hawaii should review and perhaps update these sensitivity maps utilizing wide community input. The state may consider updating the maps as part of the Coastal Zone Management Program's coral reef initiative ecosystem assessment.

6. The State Legislature should designate a lead agency for coordinating prevention activities.

If the state intends to adopt prevention strategies beyond that of the federal government, a lead agency needs to be designated. DOH, DOT, DLNR, SERC and the LEPCs have roles in preventing oil spills. Each agency has the authority to promulgate rules that reduce the possibility of an oil spill, although DOH has potentially the most sweeping authority. Enacting prevention requirements will require the promulgation of rules and close coordination with various agencies. The State Legislature should enact legislation that gives the Department of Health clear authority to prevent oil spills. The legislation should require the DOH to coordinate the efforts of other state and county agencies toward oil spill prevention so as to reduce redundancy and encourage active participation from agencies that may not view themselves as having a role in oil spill prevention.

7. The HEER office and the Coast Guard should develop a notification process to ensure that the state is notified of all oil spills.

The Coast Guard is required to notify the state immediately of all medium and major spills. It need not notify the state of minor spills not considered significant. In some circumstances, the Coast Guard may decide that a spill does not require a response – without consulting the state. It may be appropriate for the Coast Guard to notify the state of all oil spills so that the state can decide for itself whether response is necessary. The state may want to play a role in decision making over the cleanup of minor spills. The state also may wish to track all occurrences of oil spills to assist in the management of high spill areas. The state should consider entering into a new agreement with the Coast Guard to ensure that it is notified of all spills.

8. Clarify the Department of Health and Civil Defense response authorities.

The flexibility that HRS 128 gives Civil Defense may cause DOH some concern. The *Oil and Hazardous Substances Emergency Response Plan*, a supplement to the Plan for Emergency Preparedness, Volume III, clarifies that DOH has the responsibility for coordinating state actions – but that Civil Defense can take over this function. The laws should be amended to clarify exactly when conditions call for the DOH or Civil Defense to be the state responder. Alternatively, the DOH and Civil Defense may enter into a memorandum of agreement to define the circumstances when Civil Defense has authority to act on behalf of the state.

9. Clarify the roles of the state and counties.

Because the potential of conflict between DOH and County Civil Defense agencies exists, their roles should be more clearly defined. The DOH should initiate a memorandum of agreement between their department and the State and County Civil Defense agencies outlining the roles of each in the event of an oil spill. County agencies must be fully integrated into the state oil spill response command structure in the event of an emergency. During oil spill emergencies, that entity is the DOH.

10. The State Department of Transportation should, together with the Coast Guard, implement and enforce general bunkering standards and rules both offshore and within state harbors.

These standards and rules should include weather restrictions for offshore bunkering, pre-bunkering conferences, emergency shutdown plans, watch standards, and overfill alarms. Safety of transfer operations should take precedence over commercial pressures to bunker in marginal weather.

11. The state should insure response planning standards for all port areas.

Honolulu Harbor, Barber's Point, and the marine terminals receive the bulk of petroleum products and have the greatest risk of a large-scale oil spill. Because of its distance from other sources of spill response equipment, the state should petition the Coast Guard to reconsider its OSRO standard for Hawaiian port areas or set planning standards that are more stringent than the Coast Guard's. Each of the neighbor island harbors that regularly handle bulk oil receives shipments of oil in barges ranging in size from 30,000 to 67,000 barrels. Yet each has only a very limited stock of oil spill response equipment, none of which is suitable for use in anything but the calmest waters. The first 24 to 48 hours after a spill are the most critical in terms of controlling it.

12. The State Department of Land and Natural Resources should take the lead in determining how the state will handle oiled animals in the event of an oil spill.

DLNR is charged with protecting the state's wildlife. They should have a lead role in determining the level of preparedness and type of facility needed to clean up oiled wildlife in the event of a spill.

OIL SPILL PRACTICES OF OTHER STATES

The Environmental Center of the University of Hawaii undertook a survey of oil spill management practices of other states and a comparison of those practices with Hawaii. Researchers designed a questionnaire to gather information on a broad assemblage of management programs pertinent to oil production, transport, storage and handling. The states surveyed were chosen by reviewing the various state oil spill programs and legislation as published in the *Environmental Reporter*. Thirty states and the territory of Puerto Rico were selected as having some type of oil spill legislation. These states included all sea coast states as well as states having substantial freshwater shipping/transportation activities. An appropriate contact person within the lead agency responsible for administering the oil spill management programs in each state was contacted by telephone and asked to complete a questionnaire on their state's oil spill prevention and response policies.

A copy of the draft survey was initially circulated to individuals with experience in oil spill management for their critique prior to finalization and out-of-state distribution. The survey was designed to gather information on six key issues:

1. *State Legislation* – How do individual state laws, regulations, and/or ordinances relate to the Oil Pollution Act of 1990? Are they very similar, more stringent, more or less specific?
2. *Prevention* – What oil spill prevention policies or programs exist at the state level?
3. *Response* – What oil spill response policies/mechanisms exist at the state level?
4. *Funding* – What is the source of funds for state programs related to oil spill prevention and response?
5. *Coordination of Efforts* – How do different agencies involved in oil spill prevention and response coordinate efforts and work together?
6. *Policy Review and Citizen Participation* – What methods are used to review policies relating to oil spills, and what mechanisms, if any, are used to encourage citizen participation?

The results of the survey are reported in *Analysis of States' Oil Spill Management Programs* (Miller et al. 1995). Responses were received from 24 of the original 30 states and the territory of Puerto Rico.

Survey Responses Compiled for Coastal States:

Alaska	Massachusetts
Arkansas	New Hampshire
California	New Jersey
Connecticut	North Carolina
Delaware	Oregon
Florida	Rhode Island
Hawaii	South Carolina
Louisiana	Texas
Maine	Washington
Maryland	

Survey Responses Compiled for Great Lakes and Major River States:

Illinois	Wisconsin
Michigan	Wyoming
Missouri	

Analysis of State Programs

Diverse policies and administrative programs have been established by the various states surveyed to address the problem of oil pollution. These policies and programs act to supplement, and in many cases strengthen, the management requirements established by the Federal Oil Pollution Act of 1990.

States with minimal involvement in oil spill management, such as New Hampshire and Illinois, rely on the procedures required in OPA 90 without additional state requirements to manage oil spill pollution, as mandated under federal law. A number of other states, including South Carolina and Missouri, rely primarily on OPA 90 but also have related state policies and programs, especially in the area of funding emergency response to oil spills and hazardous wastes. In Oregon, Massachusetts, Alaska, Texas, Louisiana, California, Maine, and Washington, oil pollution management policies are established in separate legislation with funds being appropriated directly to oil spill management offices. In these states "Oil Spill Management Programs" are designed to supplement the policies and programs established by OPA 90 and facilitate coordination between the state's lead agency and the federal on-scene coordinators.

The development of specific state legislation or regulation has enabled state governments to add safeguards that protect their social, economic and ecological interests. In those areas where states have established separate but similar requirements to those found in OPA 90, states have provided provisions to substitute federally required documentation in place of their own. The State of Hawaii has not developed a comprehensive oil spill management program, but it is in the process of building its expertise in oil spill management so that it can become an equal partner with the federal agencies and oil industry responders.

One problem Hawaii faces, unlike states on the mainland, is the great cost of travel to meetings, conferences and training which might help state personnel increase their expertise in oil spill management. No state representative, for example, attended the 1995 Oil Spill Conference in Long Beach, California, even though it is one of the most important international meetings on oil spill management. Hawaii's year-round good weather, plentiful hotel accommodations, and the construction of a large state convention center may make it possible for the state to attract the biennial Oil Spill Conference every six years. Other regional conferences and training sessions might be persuaded to be held in Hawaii. Having access to the information exchanged at these meetings will help state oil spill managers gain in levels of expertise.

Funding

Funding mechanisms for oil spill management vary among the states surveyed. South Carolina has included the funding for oil spill management with programs related to hazardous materials. Washington, Oregon and Texas allocate funds to oil spill management and its specific programs. In these states a portion of the funding is typically allocated between oil spill response and administration of oil spill management programs. Hawaii's oil spill program is part of a larger hazardous waste response capability which is funded in part by the legislature.

A number of states, Hawaii among them, have established their own oil spill response fund either dedicated to oil spill cleanup or part of a fund dedicated to the clean up of hazardous wastes. The Hawaii Emergency Response Fund can be used for hazardous waste cleanup as well as oil. Mechanisms for providing revenue for these state funds differ but fall into one of these categories: a) fee or tax per barrel on imported refined or unrefined petroleum products, b) fee or tax on hazardous waste generated or transported, c) fee per vessel per trip, d) fines and penalties, e) federal funding, f) cost recovery or, g) some combination of the above.

All fines collected under Hawaii's hazardous waste and oil spill regulations are deposited into the state's Emergency Response Fund. Hawaii also charges a \$.05-per-barrel tax on oil entering the state. As with other states, Hawaii allows a portion of collected fees to carry out the administration of its hazardous waste and oil spill response program. In 1994 the Hawaii State Legislature amended chapter 128D HRS, the statute governing the Emergency Response Revolving Fund, to allow some of the monies to support the state's safe drinking water program. The use of oil spill management funds for the safe drinking water program has reduced the available funds for state oil spill management programs.

Prevention

Prevention has become the focus of oil spill management in most states due to the technical limitations involved with even the most advanced response techniques and equipment. Many states, including New Jersey and Oregon have recently updated, or are in the process of updating, their oil spill management programs to reflect an emphasis on prevention. States such as Washington and Alaska have instituted prevention policies and programs as part of their regulatory efforts. These prevention programs are in addition to those required in OPA 90. Other states, including Hawaii, have developed a small number of prevention programs to supplement the requirements of OPA 90.

Many of the state prevention programs revolve around education and training. Alaska, for example, has required on-scene coordinator courses to train state personnel. Public awareness campaigns are also an integral part of oil spill prevention in many states. This includes campaigns to fight against dumping of used oil on land and at sea by vehicle owners and private boat owners. For example, the Pacific Oil Spill Prevention Education Team, including members of the States/B.C. Task Force, develops and shares prevention strategies, provides public education and fosters public involvement in oil spill prevention. In addition, Washington, California, Oregon and British Columbia implemented the "Spills Aren't Slick" campaign targeted at the commercial fishing industry. This included a brochure with oil spill prevention and cleanup tips, a sign available for use at commercial fuel docks, and a toll free 1-800 number for reporting oil spills.

Oil spill prevention newsletters, oil spill information hotlines, and public review of oil spill policies and programs are also important components in other state prevention programs. Many state agencies have joined with industry to promote public awareness about oil spills and used engine oil recycling. In Washington, advisory committees and working groups, including federal and state government officials, industry representatives, environmental groups, and local indigenous tribes, regularly confer on the development and amendment of oil spill prevention policies, rules, programs and plans.

Other states carry out their own ship and plant inspection programs, have drug and alcohol abuse programs, conduct their own readiness drills, have their own data base of spill incidents, or mandate the preparation of prevention plans. As part of the requirements for prevention plans, facilities and vessels in California are required to include information on risk reduction programs. These include programs intended to reduce factors leading to technical and human error such as employee awards for accident-free periods of time.

Hawaii has statewide oil recycling collection facilities in each of the counties. In addition, the state has an on-going storm drain labeling program to help prevent oil and other pollutants from being inadvertently dumped into storm drains.

Response

The third major component of state oil spill management is response. Many states have developed oil spill or hazardous waste response policies and programs which supplement those of OPA 90. Most states surveyed have various policies which establish administrative programs in the lead agencies for oil spill response and cleanup. These programs cover a broad spectrum of activities ranging from those specifically directed toward oil spill response to those including oil with other hazardous materials.

Some states have minimal involvement in response, while others have established active roles in cooperation with federal agencies. Hawaii participates as a member of the Regional Response Team and the Area Planning Committee in the development of an area contingency plan. The bulk of Hawaii's response capabilities is in dealing with land-based oil or hazardous waste spills. For large marine spills, state representatives are part of the tripartite unified command, along with the Coast Guard and the responsible party.

Recommendations

Despite Hawaii's near total dependence on imported oil and the potential for ecological and economic catastrophe from a large oil spill, the present state of Hawaii's policies and programs for oil spill management

are less comprehensive in comparison to other coastal states. While it could be argued that oil spill management should be the sole responsibility of the federal government under OPA 90, the financial and ecological risks associated with oil spills in Hawaii necessitate state involvement. In addition, the State of Hawaii has a lead role in the federal Area Contingency Plan as an on-scene coordinator, and is responsible for working with the federal agencies and the responsible parties in case of a coastal oil spill.

1. The HEER office should interact with other states' oil spill management programs.

Regional organizations help to facilitate cooperation and stimulate new management ideas. Hawaii should consider joining the States/B.C. Task Force. This group is made up of state and provincial oil spill directors that deal with some of the same problems facing Hawaii. Working together with peers can make finding solutions to problems or introducing new practices much easier.

2. The State Legislature should limit the programs that are funded from the State Emergency Revolving Fund to those dealing with oil spill or hazardous waste management.

Funding other non-oil spill management programs with the Emergency Response Revolving Fund potentially jeopardizes the reliability and sustainability of state oil spill management funding and program development. The state should limit the use of the fund to oil spill management activities including oil spill response, prevention planning and administration of the HEER office. The state should work with the USCG and industry to determine the best use of the monies available from this fund in a coordinated effort to identify which projects and initiatives will best serve the prevention and response community in Hawaii. Chapter 128D, HRS, should also be amended to explicitly establish that a percentage of the Emergency Response Revolving Fund will be set aside for the administration of the state's prevention and response program. This would alleviate any confusion concerning the appropriation of oil spill management funds by the lead agency.

3. The HEER office, with assistance from the Department of Business, Economic Development and Tourism, and the Hawaii Visitors Bureau, should attempt to attract the biennial Oil Spill Conference to be held in Hawaii at regular intervals.

The state is an ideal location to attract the leaders of the world's shipping interests to an international conference on oil spill management. With the completion of the state's conference center in Honolulu, the state would have an appropriate facility. Rotating the conference to Honolulu every sixth year, for example, will allow for more participation by island oil spill planners and will facilitate participation from Pacific island and rim nations.

HAWAII'S OIL SPILL PREVENTION AND RESPONSE PREPAREDNESS SYSTEM

This section will identify, examine, assess and evaluate the capabilities of agencies and organizations in Hawaii to prevent, respond to or mitigate oil spills, and to make recommendations for improvements where needed.

As might be expected, such an in-depth evaluation of capabilities in the state was a sensitive issue. Each of the various entities involved in the management of oil spills, whether engaged in prevention, response or both, is confident that all possible measures are taken to assure that Hawaii is adequately protected. To objectively and authoritatively evaluate the various operations, we engaged the services of "outside" experts with extensive and direct experience with major spills and prevention programs in other states who could also examine oil spill management practices in Hawaii from an unbiased and objective perspective.

Rick Steiner, a University of Alaska Sea Grant Extension Agent and oil spill expert, and Richard Townsend of Townsend Environmental, Inc. a private oil spill consultant from Oregon, were selected to undertake this part of the oil spill study. Both men have extensive experience with the oil industry, state and federal oil spill regulatory agencies, and direct hands-on experience with the implementation of federal and state government operations under both regulatory and emergency conditions.

OPA 90

The Oil Pollution Act of 1990 (OPA 90) set up a planning and command structure to increase emphasis on oil spill prevention and to create a coordinated response structure (Randle 1991). OPA 90 addresses prevention by significantly raising the liability limits on those responsible for spilling oil and by mandating that only double-hulled tankers be used in U.S. ports by the year 2015. OPA 90 completely revised the requirements of the National Contingency Plan (NCP) so that it coordinates the response effort from the national to local level in case of a large oil spill (Randle 1991). It also requires all vessels and facilities to have oil spill response plans in place by 1993 and resubmit them for final approval in August 1995 (Irion 1993).

Hawaii's Current Preparedness

In reviewing Hawaii's general state of preparedness for a major oil spill, substantial progress has been made by industry/government since 1989: safety conditions at the Barbers Point Marine Terminal (BPMT) have been improved; tankers now avoid the Kaiwi Channel; and, there is more spill response equipment available. Both the *Exxon Houston* incident in Hawaii and the *Exxon Valdez* oil spill in Alaska alerted industry, government, and the public to the potential magnitude of ecological, economic, and social upheaval resulting from a major oil spill. Furthermore, OPA 90, particularly its liability provisions, has been an obvious motivation to improve safety.

Despite improvements in Hawaii's preparedness, problems still exist in the spill prevention and response system in Hawaii. The review team reported (Steiner and Townsend 1995) that industry and government seemed far more interested in preserving the status quo than in dedicating the resources and vigilance necessary to continually improve the safety of the oil transport system.

The evaluation team pointed to a number of factors that reduce the risk of a catastrophic marine spill. They include the following:

- The approach to the Barbers Point Marine Terminal (BPMT) is in deep open ocean water
- Weather and sea conditions are generally moderate, and visibility is good
- Shoreline extent and configuration and ocean current dynamics could reduce shoreline oiling
- Tidal variation is relatively small in Hawaii
- Warm air and sea temperatures and high solar insolation climates are much more conducive to oil degradation than colder climates

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- Some harbors (i.e., Barber's Point, Pearl and Honolulu) have relatively narrow entrances that might make it easier to contain spills within them

The evaluation team reported, however, that the risk of a major spill in Hawaii is very real, its probable consequence would be catastrophic, and thus this risk must be treated seriously (Pfund 1992).

Prevention

Once oil spills into the water in large volumes it is difficult, if not impossible, to:

- contain the spill
- recover all the oil
- clean shorelines effectively
- prevent injury to wildlife
- rehabilitate injured wildlife
- restore spill-injured ecosystems
- stabilize spill-injured social and economic systems

In all cases of large-scale oil spills, only a small percentage of the oil was ever recovered. Preventing oil spills from occurring is the only sure way to keep oil out of the marine environment.

Tanker Fleet

An important factor in preventing oil spills in Hawaii is the suitability of vessels that call to port. The evaluation team found that the overall quality of the Hawaii tanker fleet is above the world average. The Hawaii fleet is generally newer than the world fleet average, are classed by one of the four most reputable IACS classification societies, and are operated generally by only two shipping companies — Chevron and Teekay Canada. There is a higher percentage of double hulls in the Hawaii trade than the world average, and the McKenzie Ratings for the Hawaii fleet are substantially higher than the world average.

However, it cannot be concluded that the quality of the Hawaii fleet is as high as it could be. The evaluation results point to several risk factors. Most of the Hawaii fleet bear flags of convenience (open registry nations), most range in size from 700' – 900' (which the Coast Guard's Tanker Safety Study Group found to have more reported structural failures than other sized vessels), most are single hulled, five are rated below average by McKenzie's rating system, 16 are 15 years old or older, and many appear to be owned by single vessel companies and banks.

Crew Competence and Flags of Convenience

Another important factor in the prevention of large oil spills in Hawaii is the competency, vigilance, and alertness of crews operating tankers, tank barges, and other large vessels. The U.S. Coast Guard Tanker Safety Study Group identified the most significant factors adversely affecting the operational safety of oil tankers. Human factors were found to contribute to 90% of all grounding and collisions, and about 75% of all fires and explosions. The study group reaffirmed that primary emphasis in preventing marine casualties should be on improving the ability of human beings to function effectively in the shipboard environment (U.S. Coast Guard 1989).

A problem in the prevention of oil spills is the use of flag vessels and crews of convenience. Most of the oil hauled to Hawaii is on flag of convenience vessels. A 1993 report by NUMAST, the U.K. Seafarer's Union, points out the seriousness of the growing reliance on flag of convenience vessels manned with crews of convenience for hauling oil in global trades.

Their analysis showed that 66% of the 68 largest oil spills between 1967 and 1984 involved flag of convenience or Greek registered tonnage. They reported that flags of convenience were among the fastest growing in the world. For instance, just in the five-year period from 1987–1992, Liberia's fleet grew by 7%,

Panama's by 15% (these two countries already flag about 1/3 of the world's tanker fleet), Cyprus's by 30%, the Bahamas's by 120%, and Malta's by 487% (NUMAST 1993).

Likewise, most flags of convenience vessels employ multinational crews of convenience, which have proven to be a contributory factor in a number of shipping disasters.

NUMAST (1993) goes on to report, "What is certain is that there is now a recognition within the international shipping industry that all is not well on the crewing front." In addition to language problems, the increasing use of mixed nationality crews [as in Hawaii] probably has psychological and social implications for safe vessel operation.

Vessel Inspection

Both refining companies in Hawaii have instituted procedures for vessel screening prior to charter for delivery. In addition, the Coast Guard regularly inspects tank vessels that come to Hawaii. As cited earlier, the tank vessels delivering fuel to the state were rated above average. However, many vessels in the Hawaii trade are flag of convenience vessels, among the most likely to develop problems. Of significance is the Coast Guard's Tanker Safety Study Group (1989) finding that "increased vessel size, sophisticated automation systems, quick in-port turn-around, and limited Coast Guard inspection resources create formidable problems impacting the Coast Guard's ability to reasonably ensure that U.S. ports are not exposed to a high degree of risk from tank vessel operations.

Vessel Traffic

One of the principal tools in minimizing vessel groundings and collisions is the implementation and vigilant operation of various vessel traffic systems. The Port of Honolulu was not included in the Coast Guard Port-Needs Study to determine the benefits of an automated vessel traffic system (VTS) because of the recommendation of the Captain of the Port who felt that the amount of vessel traffic, ease of entry into the Port of Honolulu, and sufficient manual monitoring by Aloha Tower for the port made an automated VTS unnecessary. However, significant risk factors off south Oahu, which are itemized in general as VTS-addressable by the Port-Needs Study, create the potential for open water collisions between vessels caused by simple miscalculations on the bridge, certain overtaking situations, and some casualties involving vessels at anchorage. A thorough vessel traffic pattern analysis should be conducted for Hawaii, including the routes of vessels of innocent passage, and it should recommend whether any upgrade in the vessel traffic system might enhance the safety of oil transport in Hawaii.

Offshore Marine Terminal

Much of Hawaii's petroleum products enter through offshore marine terminals. The volume of crude oil and products transferred at the offshore marine terminals at Barber's Point, the site's exposure to wind, sea and currents, and its close proximity to shore and shallow depth present a significant risk for a major oil spill. Despite the well-intended precautions of vessel operators, tugs and terminal operators, human error or mechanical failure could lead to potentially disastrous consequences at the terminal. Both BHP and Chevron appear to adequately monitor the safety of the offshore terminals. However, this is an area with which the State of Hawaii and the HEER office should be concerned. State oversight of the offshore marine terminal should be increased.

Disabled Vessel Assistance

The potential loss of power or steering on tankers, tugs with fuel barges in tow, or cargo vessels is a serious oil spill risk factor. As these vessels operate close to shore along some routes and in confined waterways on their approach to harbors, either the loss of their main engines or rudder, or both, could easily lead to grounding or collision and oil spill. The ability to render immediate, effective assistance to disabled vessels is an important safeguard against vessel casualty and consequent environmental damage.

There is some question whether the largest tugs in the state are adequate to prevent large crude carriers such as the *Exxon Houston* from grounding due to loss of power during an approach to an offshore terminal. Another concern is grounding by ships of innocent passage due to loss of power. These are ships that may not have been inspected by the Coast Guard or by local petroleum companies and may be substandard or manned by poorly trained crews. If one of these ships were to lose power in one of the channels through the islands there may not be sufficient tug power available to bring the disabled vessel to a halt.

The subject of tug capacity should be carefully considered by the Area Planning Committee. The state may need to hire an independent contractor to consider the question.

Another safeguard would be to have all vessels in the Hawaii oil trade equipped with emergency tow packages. Such systems now exist on Arco and Exxon vessels in the Alaska oil trade.

Interisland Tug and Barge Transport

Another significant risk of major spills in Hawaii is from the interisland barge transport of petroleum products. Interisland product barges range in cargo capacity from 30,000 – 67,000 barrels (1.2 – 2.8 million gallons). Each year they carry approximately 153 million gallons of petroleum products, primarily gasoline, fuel oil, and jet fuel to other island harbors, such as Kaunakakai, Port Allen, Nawiliwili, Kahului, Kawaihae and Hilo (Pfund 1992). The tugboats used to tow fuel barges are uninspected vessels.

The 1994 Coast Guard study, "Review of Marine Safety Issues Related to Uninspected Towing Vessels," reveals that by analyzing towing vessel casualty statistics, the majority of the casualties experienced is directly attributable to human error. The U.S. Coast Guard study made 19 recommendations concerning improvements in licensing and qualifications, training, casualty reporting, obstruction fendering systems and lightering, adequacy of navigation equipment, and adequacy of aids to navigation for towboats. The HEER office should obtain a copy of the study and determine its applicability to the situation in Hawaii.

Response

Clearly, oil spill prevention is the key to protecting Hawaii from the effects of oil spills. One of the best spill responses ever mounted in this country, the *American Trader* cleanup in Huntington Beach, California, in 1990, saw just 25% of the spilled oil recovered. Another 44% is estimated to have evaporated or been naturally dispersed into the water column. In this case the weather cooperated, winds were calm, and extensive inventories of spill response equipment were immediately at hand.

Hawaii can and must be prepared to mount a response to a major oil spill. Effective response can reduce the effects of oil spills since being prepared is the best antidote for failed prevention.

Spill History

The historical record of oil spills in the state was difficult to obtain, but it is clear that although there have been no major oil spills in the Hawaiian Islands since the inception of OPA 90, the state is not immune to large spills. In fact, some of the spills that have occurred in or near the Hawaiian Islands, most not sizable enough to be called catastrophic, could have been much worse. Consider the following:

- The tanker *Austin* spilled only a small amount of oil when it grounded at the entrance to Honolulu Harbor. However, it was carrying over 9.5 million gallons of oil; the *Exxon Valdez* spilled approximately 10.8 million gallons.
- The *Hawaiian Patriot* spill happened when the ship was just one day's sailing from Barber's Point. Had the accident occurred a few hours later, the 30 million gallon spill would have happened off Kauai or Oahu instead of 300 miles from shore.
- The Navy tanker U.S.S. *Roanoke* grounded at the entrance to Pearl Harbor after losing steering while carrying 7 million gallons of oil. Had weather conditions been worse, it could have lost much more than the 107,000 gallons spilled.

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- The *Exxon Houston* grounded near Barber's Point. Through a combination of hard work and luck, the ship did not break up and lose the remainder of the oil it was carrying. The federal on-scene coordinator observed that "we were all fortunate that the T/V *Exxon Houston* did not lose the remaining 90,000 barrels [3.8 million gallons] of crude oil and 2,000 barrels [84,000 gallons] of Bunker C fuel oil."

Thus, it is prudent for Hawaii to be prepared to respond as effectively as possible to major and catastrophic oil spills.

Response Organization

Federal law establishes a rather complex structure for a spill response organization, called the National Response System. At the planning stage, it starts with the National Response Team (NRT), and goes through the Regional Response Team (RRT) to the Area Planning Committee (APC). During a major spill response, the NRT and RRT may provide advice and coordination, and the federal on-scene coordinator, state on-scene coordinator, and responsible party incident manager provide direction for the actual response.

The State of Hawaii has responsibilities during both the planning and response stages. Specifically, because of its responsibilities to its residents and to visitors, and because of its role as trustee for certain natural resources, the State of Hawaii should take an active role in oil spill response planning and operations. Our interviews, document reviews, and observations demonstrate there is a widespread perception that the state has not been able to carry out some of these responsibilities as fully as possible.

In particular, we repeatedly heard that the state could participate more fully in oil spill drills and actual responses to even relatively minor spills. Through the interactions this type of involvement would create, better working relationships with the Coast Guard and industry might be established.

The HEER personnel should actively participate in all oil spill response planning efforts undertaken in the state. The HEER office should be represented on, and take a proactive role in, the area committee established under OPA 90. In addition, the HEER office should be present at all oil spill response drills, either as a participant in appropriate cases or as an observer. The HEER office, as the responsible state agency, should be integrated into any unified command structure established during drills and, of course, during actual oil spill response. Finally, the HEER office should promulgate any needed regulations regarding oil spill response.

State of Hawaii Oil and Hazardous Substances Emergency Response Plan

The State of Hawaii currently operates under the *Oil and Hazardous Substances Emergency Response Plan* (HSERC 1992), which is a supplement to the state's overall emergency preparedness plan. The contingency plan, prepared in March 1992, is a good basic plan but it could be improved in certain ways.

For example, the state has oil spill response resources within its control that should be expressly acknowledged and listed within the context of the state's contingency plan. Moreover, the state has responsibility for natural and economic resources within its jurisdiction. These important state interests may or may not be adequately represented by the Coast Guard, responsible parties and other spill responders. The state is the trustee for certain ecologically sensitive areas. Ensuring their protection is the responsibility of the state. Additionally, the state's relationship with local governments make it the natural focus of local spill response efforts. All these areas should be fully addressed in the state's plan.

Oil Exclusion Equipment

The state should identify resources of particular significance and the specific equipment needed to protect them in the event of a spill. This equipment should be maintained on-site in an easily deployable manner. Shoreline boom anchors should be in place at channels so that, if possible, booms merely have to be strung. As time permits during the course of the response, additional anchoring, including the use of in-water boom anchors, could be accomplished.

Lightering Standard for Laden Tank Vessels and Tank Barges

Vessel casualties resulting in oil spills seldom damage all the tanks on the vessel. Similarly, damaged tanks sometimes do not spill their entire contents. To prevent greater loss of oil, enhance ship stability, or enable salvage of a grounded tanker, responders may have to remove the remaining oil in the damaged tanks and some of the oil in undamaged tanks to other vessels. However, there is little commonality in manifold fittings in tank vessels. The state should require tank vessels and barges to carry equipment (i.e., reducers, hoses and adapters) that allow them to use a standard package of oil transfer equipment and to demonstrate that they carry, or have immediate access to, sufficient oil transfer equipment to lighter to and from other vessels.

Clean Beach Standard

At what point after a spill should beaches be re-opened to the public for all the typical contact that beach use implies? Traditionally, beaches in most of the U.S. have been opened to public use after an oil spill when oil could not be seen, felt, or smelled in the sand. But this approach, as inexact as it is, may leave a potential for significant public exposure to hydrocarbons that may not be detectable with the ordinary senses. The state should work with the Coast Guard and county officials to design a procedure for determining the end to a beach cleanup after an oil spill. Tebeau (1995) examined several potential procedures for determining when a cleanup effort was complete. His recommendation was to use some form of a general consensus approach wherein the responsible party and the representatives of state and federal agencies make a determination that the cleanup is complete based on qualitative criteria. A more quantitative measure was developed after the *American Trader* oil spill off Huntington Beach, California (Fischer & Martinet 1993). In that case, officials deemed the cleanup complete when the average hydrocarbon level of the beach sand samples taken every 500 feet was less than 100 ppm.

Marine Firefighting Capabilities

Fires and explosions account for up to half of all the tankers lost in recent years. Many of the world's largest oil spills have resulted from fires, including the *Castillo de Bellver* (50 to 80 million gallons, 1983, off South Africa), the *Atlantic Empress* (41.5 million gallons, 1979, off Barbados), the *Irene's Serenade* (12 to 36 million gallons, 1980, off Greece) and the *Hawaiian Patriot* (30.4 million gallons, 1977, 120 miles off Necker Island). More recently, the *Puerto Rican* exploded and burned off San Francisco in 1984 (one death, over a million gallons of oil spilled), and in 1990 the *Mega Borg* experienced a fire and major oil spill in the Gulf of Mexico.

Honolulu has a modern harbor fireboat, the *Mokuahi*. The former fireboat, the *Abner T. Longley*, recently used in tours of the harbor, is still equipped with its firefighting pumps and monitors. But neither fireboat is designed for offshore firefighting. Some of the tugs based at Honolulu also have some firefighting capability. The *Nunui* will soon have a remote-controlled monitor, and at least one of the Sause Brothers tugs has a monitor.

Despite the availability of these resources, the state should seek means to enhance the ability to fight offshore fires in all weather conditions. There is a need for firefighting vessels capable of offshore operation and of providing water and foam to the deck of a very large crude oil carrier in accordance with ABS Class I firefighting standards.

Fire safety also should be improved in Honolulu Harbor. Protection is especially important at the berths normally used for shore-to-vessel and vessel-to-shore transfers, specifically Piers 28, 29, 30, 31, 32, 33, 34 and 51A. Fixed shoreside monitors and pumps commonly are used at oil transfer berths in other harbors and should be considered here. The same is true of Piers P-5 and P-6 at Barber's Point Harbor.

At the petroleum berths at harbors on the other islands, there is no fire protection other than the local fire departments. Pumps and monitors also should be considered for these sites. It may also be useful to require that tugs based or used at these harbors be equipped with firefighting capabilities.

Oil Spill Response Drills

The Coast Guard, Clean Islands Council (CIC), Marine Spill Response Corporation (MSRC) and others periodically conduct oil spill response drills. These generally are intended to test specific aspects of the sponsoring entity's response planning or resources. The state should identify specific aspects of spill response planning and operations that it wants to test and conduct drills accordingly. These drills should be part of the drills conducted under the Area Planning Committee or drills designed by the HEER office and should have specific goals and objectives. They also should be based on realistic scenarios. The point of the drill is to gain knowledge and familiarity with spill response.

The state should develop a program of evaluations for its own drills, as well as for drills initiated by others in which it participates. The evaluations must be based on a solid understanding of oil spill contingency planning and the conduct of oil spill drills.

Dispersants and In-Situ Burning

Dispersants and in-situ burning can be valuable tools in some circumstances, and each requires rapid decision making because the window of opportunity for effective use of either technique is quite small. To this end, the Coast Guard, EPA and the State of Hawaii have entered into letters of agreement on the use of dispersants and in-situ burning. The existing letters of agreement specify that dispersants and in-situ burning are to be used only after all available methods of physical or mechanical removal have been found to be infeasible or ineffective.

One problem with the letter of agreement on the use of dispersants is the small maps that accompany it to show the dispersant exclusion zone. As presently drawn they are of little use in identifying areas where dispersants are allowed or prohibited.

There are several problems with the use of in-situ burning as a response technique. Spilled oil is difficult to ignite. Several proprietary igniters are on the market, but none have demonstrated effectiveness in anything but the most benign conditions. Once lit, the oil must reach high enough temperatures to maintain the burn. This is difficult on the ocean because as the slick burns it thins and the cooling effects of the wind and water eventually extinguish the burn. In any event, the oil must be of sufficient thickness to be burned, which on the open sea usually means that it must be artificially concentrated using fire-resistant booms, a process fraught with all the difficulties associated with oil containment at sea. In addition, there are no fireproof booms or igniters available in Hawaii.

In-situ burning is still a relatively new technique which will require more study to determine safety and allowable conditions. The key to in-situ burning as an actual response technology is having a pre-approved agreement outlining conditions of its use. Hawaii has had a pre-approved in-situ burning agreement since 1994. However, the state and the Area Planning Committee should reevaluate the existing agreement in light of pre-approved strategies/protocols worked out for other areas, such as the gulf coast and the northwest regions.

Worst Case Oil Spill in Hawaii

There also exists the possibility of simultaneous loss of two loaded tankers due to a collision near the offshore terminals because of their proximity to one another. Another potential worst case scenario may involve the grounding or breakup of a loaded tanker in the northwestern Hawaiian Islands. Response in this scenario may be hampered by the lack of any facilities in these uninhabited islands and the necessity of transporting for cleanup the many marine mammals and birds which would become oiled. It would be prudent for oil spill planners to consider these scenarios in their planning standards for catastrophic spill response.

Proposed Hawaii Marine Safety Office

A major recommendation made by Steiner and Townsend (1995) was the creation of a state Office of Marine Safety within the Department of Transportation which would have the overall responsibility for

directing Hawaii's participation in the state's oil spill management regime. This recommendation was considered premature by the local response community since there have been few large marine spills and little potential for large land-based spills. Another response to the proposed Hawaii Marine Safety Office was that it would needlessly duplicate the work done by existing agencies. An alternate proposal, upgrading the capabilities of the existing HEER office, follows.

Recommendations

1. The HEER office should commission a thorough risk assessment of the current practices for transporting oil and other hazardous substances through Hawaiian waters.

The assessment should identify potential causes, sources, volumes and types of oil spilled, potential flow rates, spreading characteristics and encounter rates. This could take approximately two years and should be conducted by maritime experts and risk analysts. This assessment should accomplish these tasks:

- Identify vessel traffic patterns — particularly for tankers, tank barges, cargo, and passenger vessels — and identify traffic convergence/restrictions and the locations and situations that could cause collision or grounding.
- Evaluate the potential benefit of various vessel tracking/traffic systems, as was done in other ports in the Coast Guard VTS 2000 project, including automated surveillance systems.
- Evaluate and compare the relative safety risk of the two types of offshore moorings — single point and multipoint — at Barbers Point Marine Terminal (BPMT), and if one proves inherently safer, require the conversion of the other to the safer system.
- Include a rigorous analysis of the spill risk from disabled vessels such as loaded tankers and tank barges, and how best to minimize such risk. The disabled tanker study should include an analysis of the full spectrum of power/rudder failure scenarios — various failure recognition times, sea conditions, wind speeds and directions, size and speed of tank vessels, and proximity to grounding or collision situations. It should also include various tug types, sizes and response times to take disabled tank vessels in tow.

As an interim protective approach, before the vessel traffic pattern analysis is completed and as part of the risk assessment, the following should be implemented:

- An east-west traffic separation scheme (TSS) for large transiting vessels off south Oahu and in the channels to the east and west of the island to reduce the risk of collision.
- A mandatory exclusion in the pilotage area around the Barbers Point Marine Terminal for any vessels other than those directly engaged in commerce at the terminal.
- All large vessels (i.e., oil, cargo, passenger) should be excluded from transiting within 10 miles of any shore or shoal unless they are on approach to, or exiting from, a harbor or anchorage, and then shall transit only in such a way as to leave maximum sea room between the vessel and shoal or shore at all times.

2. The HEER office should establish, administer, and fund a Marine Safety Citizens' Advisory Council.

It seems essential that local citizens — those with the most at stake and often the most knowledge in this area — be given an active voice in the protection of their shores. The council, for instance, could be composed of representatives from tourism, commercial fishing, Native Hawaiians, environmental groups, municipalities and business. The citizens' council would advise government regulators, industry and the area planning committee. Alternately, the HEER office may consider using the State Emergency Response Commission (SERC) and the Local Emergency Planning Committees (LEPC), required under the Superfund Act, to act as an advisory group for oil spills management.

3. All oil shippers — crude oil tankers, product tankers, and interisland tank barges — should be required to demonstrate to the State Department of Transportation that they have in place at all

times adequate salvage and emergency towing capability on standby or in escort sufficient to take control of laden, disabled tank vessels in any and all possible situations along their route.

The loss of propulsion or steerage is a very serious concern. Disabled tanker contingencies could include pre-positioned tugs, escort tugs, or any combination of the two. It could also include a contractual relationship with NavySup/Salv capability. The tugs must demonstrate maneuvering characteristics and horsepower sufficient to accomplish the task of vessel control, even in extreme situations. In addition to laden crude oil tankers transiting to and from Barbers Point Marine Terminal, of particular concern is loss of power or steerage on harbor approaches of interisland barges and product tankers.

4. **The HEER office should request that the U.S. Coast Guard require emergency tow packages on all tank vessels.**

Protocols for the assessment of the urgency of the situation and emergency towing protocols and equipment need to be planned well ahead of time. Every tank vessel should be fitted with adequate towing wire and with pick-up line and buoys that can be easily deployed in emergency situations. For tankers, the Prince William Sound emergency tow package might provide a model: 400 feet of 2 1/4" tow wire, 720 feet of 6" circumference polypropylene floating pick-up line, pick-up buoy, 2 1/4" D-shackle connecting pick-up line to tow wire. It should be stored in a manner, such as on a reel, to allow rapid deployment — within 15 minutes — by a crew of two without power.

5. **The HEER office should request that the Coast Guard conduct a thorough evaluation of crew competence aboard tank vessels involved in Hawaiian waters.**

Crew competence is a critical factor in preventing oil spills. The Coast Guard has the expertise to judge crew competence and has been studying human performance in situations found aboard ocean-going vessels with the aim toward revising crewing standards for U.S.-flagged vessels.

6. **The State Department of Transportation should develop a system for improving the safety of uninspected towing vessels.**

This would include regular inspections, operator/crew standards, radar endorsement requirements, and collision avoidance training, relying on recommendations from the Coast Guard's Uninspected Towing Vessel Safety Study.

7. **The HEER office should establish a confidential reporting system to report problems with vessels or facilities.**

This would allow maritime industry employees — either on vessels or ashore — to report problems without fear of retribution by employers. A 1-800 number should be established and industry should be required to post and/or otherwise notify its employees. The state should also access the Marine Accident Reporting Scheme (MARS) which was recently established by the Nautical Institute of London to allow anonymous whistleblowing by tanker crews concerning safety risks.

8. **The Department of Transportation should require the installation of weather buoys at Barbers Point Marine Terminal (BPMT) and at the bunkering area outside Honolulu Harbor.**

These weather buoys should provide continuous, real-time wind and sea conditions to Aloha Tower, and should be used to enforce stop/go conditions for transfer operations.

9. **The HEER office should request that the Area Planning Committee, Coast Guard, or the State Department of Transportation conduct an assessment of existing tug escort vessels to determine whether sufficient tug capacity exists to act in emergency situations to prevent large tanker grounding.**

The assessment should examine whether existing tugs have sufficient capabilities to maneuver laden vessels in case of loss of power or steerage. It should also examine whether laden tank vessels entering Barber's Point Harbor should be tethered to an assist tug. The assessment might also include the feasibility of requiring tractor tugs (Lindsay Foss class tugs of 7,600 hp or more) on standby near the offshore oil terminal.

10. The State Department of Transportation should establish routing agreements/shipping lanes for interisland tugs/barges, and other waterway users should be notified that these are cautionary areas. Interisland product barges range in cargo capacity from 30,000 – 67,000 barrels (1.2 – 2.8 million gallons). Each year they carry approximately 153 million gallons of petroleum products — primarily gasoline, fuel oil and jet fuel — to neighbor island harbors. Because they have the potential to cause a significant spill, these vessels should be assigned specific shipping lanes so that other interisland vessels can exercise caution when operating in these lanes.

11. The HEER office should commission a thorough assessment of the salvage posture in Hawaii. Large disabled tank, cargo, and passenger vessels could run aground in the Hawaiian Islands and cause a catastrophic oil spill. There is a question whether the state has sufficient salvage capacity to prevent this type of accident from occurring.

12. The Coast Guard should require all tank vessels to have helms fitted with autopilot alarms. These alarms are capable of indicating that if the helm is turned with the autopilot engaged, an alarm will notify the watchstander that the rudder did not respond.

13. State HEER personnel should participate in regular industry inspections of hoses, buoys, anchors, and seabed pipelines at the offshore marine terminals. As part of its oversight functions the HEER office should be involved in the inspection of oil terminal facilities.

14. The HEER and State Civil Defense should improve the Hawaii Oil and Hazardous Substances Emergency Response Plan. The state has oil spill response resources within its control that should be expressly acknowledged and listed within the context of the state's contingency plan. Moreover, the state has responsibilities for natural and economic resources within its jurisdiction. These important state interests may or may not be adequately represented by the Coast Guard, responsible parties, and other spill responders. For example, the state is the trustee for certain ecologically sensitive areas; ensuring their protection is the responsibility of the state. Additionally, the state's relationship with local governments makes it the natural focus of local spill response efforts.

Specific areas that the plan should focus on include the following:

- A description of the state's goals for oil spill response
- Detailed descriptions of specific roles and responsibilities within the state's response for each state agency (and local government agencies)
- Response operations, including containment and control, communications, wildlife relocation and deterrence, disposal of oily debris and waste oil, temporary oil storage, and documentation and cost recovery
- Up-to-date listings of state and local government-owned response equipment, including such information as sizes, quantities, and location
- Resource protection, with mapping of important economic and environmental resources, together with specific descriptions of preferred means of protecting them, access points, staging areas, special characteristics, jurisdictional issues, and other relevant information
- Wildlife rehabilitation, including responsibilities, policies and priorities, equipment, facilities, and disposal of carcasses
- Natural resource damage assessment, so that a data-gathering plan is available at the outset of the spill
- Policies and procedures for dealing with volunteers
- Policies and procedures for dealing with the news media
- Response training and periodic drills

15. The HEER office should require prestaging of appropriate oil exclusion equipment at key points. Time will be of the essence in protecting key economic and environmental resources. The state should

identify resources of particular significance and the specific equipment needed to keep oil out of them. This equipment should be maintained on-site in an easily deployable manner. Shoreline boom anchors should be in place at channels so that booms merely have to be strung. No site should be dependent on single booming for its protection.

16. **The HEER office should request that the Coast Guard or the Area Planning Committee establish lightering standards for laden tank vessels and tank barges.**

Vessel casualties resulting in oil spills seldom damage all the tanks on the vessel. Similarly, damaged tanks sometimes do not spill their entire contents. To prevent greater loss of oil, damaged tanks and the remaining undamaged tanks may have to be emptied. To accomplish this, the state should require that laden tank vessels carry, or have immediate access to, sufficient oil transfer equipment to lighter to and from other vessels. Because there is little commonality in manifold fittings that would have to be used to lighter a stricken vessel, the state should require tank vessels to carry equipment (i.e., reducers, hoses and adapters) which would allow them to use a standard package of oil transfer equipment.

17. **The Department of Health and the Coast Guard should establish a "clean beach standard" to be used in deciding whether to end cleanup efforts and reopen oiled beaches.**

Hawaii's beaches are the core of the tourist economy. Hundreds of thousands of sunbathers, swimmers, surfers and others use the beaches each year. Accordingly, the state has to be especially concerned about the impact that any residual oil on the beaches might have on the public's health and safety. Traditionally, beaches in most areas of the U.S. have been opened to public use after an oil spill when oil could not be seen, felt, or smelled in the sand. This approach may leave a potential for significant public exposure to hydrocarbons. A numerical hydrocarbon concentration standard, based on accepted testing protocols, would reduce the possibility of such exposure and provide a readily measurable, quantifiable standard for decision makers with regard to beach cleanup.

18. **The State Department of Transportation (DOT) should enhance marine firefighting capabilities.**

Honolulu has a modern harbor fireboat and the former fireboat, recently used in tours of the harbor, is still equipped with its firefighting pumps and monitors. But neither the *Mokuahi* nor the *Abner T. Longley* is designed for offshore firefighting. While each of these vessels can respond to offshore fires under certain conditions, under moderate to severe weather conditions, they likely would be unable to function outside the harbor. The DOT should seek means to enhance the ability to fight offshore fires in more severe conditions of winds and waves.

Fire safety also should be improved in Honolulu Harbor. Protection is especially important at the berths normally used for shore-to-vessel and vessel-to-shore transfers, specifically Piers 28, 29, 30, 31, 32, 33, 34 and 51A. Fixed shoreside monitors and pumps commonly are used at oil transfer berths in other harbors and should be considered here. The same is true of Piers P-5, and P-6 at Barber's Point Harbor.

At the petroleum transfer berths at harbors on the other islands, there is no fire protection other than the local fire departments. Pumps and monitors also should be considered for these sites. It may also be useful to require tugs based or used at these harbors to be equipped with firefighting capabilities.

19. **The HEER office should design oil spill response drills as part of the regularly conducted Area Planning Committee drills or develop their own drills that would test aspects of the state's response capabilities.**

The Coast Guard, CIC, MSRC and others periodically conduct oil spill response drills. These generally test specific aspects of the sponsoring entity's response planning or resources. The state should identify specific aspects of spill response planning and operations that it wants to test and conduct drills accordingly. For instance, state-sponsored on-water drills could focus on practicing exclusionary or diversion booming of critical waterways or other resources of importance to the state. Table top drills could focus on mobilization of state resources and personnel from affected agencies. Whatever drills the state conducts it should plan and evaluate carefully.

20. The State Department of Health should rigorously evaluate current policies and practices relating to the use of dispersants and in-situ burning.

The existing protocols on the use of dispersants and in-situ burning are flawed and should be reevaluated. More attention should be given to health effects, effects of currents and winds, and other factors that make the use of these non-mechanical approaches difficult to control and that give them uncertain effects.

To the extent that response is predicated on the use of dispersants or in-situ burning, or any other strategy, responders should be required to show that the equipment and supplies needed are on hand or readily available. Presently there is very little dispersant available and no fire booms are available on the islands. If these are to be the response strategies relied on, the present ability to use them effectively is non-existent.

The key to making dispersants and in-situ burning useful tools for responding to oil spills is pre-approval of their use by federal and state authorities. Without the likelihood that these technologies would be approved during an actual spill response, it is difficult for industry to justify the significant investment necessary to maintain this type of capability.

21. The HEER office should request the APC to reconsider the worst case oil spill scenario to determine the potential of an alternate scenario.

The present Coast Guard Area Contingency Plan defines the worst case spill as the immediate and total loss of the entire cargo of a 150,000 dwt tanker. This would amount to a spill of about 1,000,000 barrels. Another possible worst case would be the loss of two such tankers in a collision in the vicinity of the terminals. Another possibility would be a large oil spill in the northwestern Hawaiian Islands.

POTENTIAL OIL SPILLS FROM NONTANK VESSELS

The majority of Hawaii's prevention and response planning efforts is geared toward large oil spills from tank vessels and barges. Tank vessels and barges have the potential for spilling large amounts of crude and refined product into Hawaii's waterways and deserve a great deal of planning effort to prevent or respond to spills caused by them. Nontank vessels can also cause damaging spills. In October 1994, the fishing vessel *Friendship* was grounded on a reef outside Kewalo Basin with 10,000 gallons of diesel fuel in its hold (*Honolulu Advertiser* 1994). An even larger amount, 100,000 gallons, was on the fishing vessel *Jin Shiang Fa* when it ran aground at Rose Atoll in American Samoa and spilled its entire contents of fuel (Capune 1995). The potential for oil spills by nontank vessels in Hawaii was investigated by Noel Ludwig (1995), a former East-West Center research associate. His report, *Nontanker Marine Vessels in Hawaii: Considerations Regarding the Oil Pollution Act of 1990*, is included here as Appendix 5.

Nontank Vessel Fleet in Hawaii

There are a number of *domestic* commercial fishing, charter-fishing, tour and tug vessels in Hawaii that are capable of medium-sized spills of 10,000 to 100,000 gallons. Most cargo, cruise, and *foreign* commercial fishing vessels, as well as some tugs, are capable of large oil spills of over 100,000 gallons. Some cruise ships are capable of very large oil spills (>1 million gallons). Older vessels are particularly notable in Hawaii's fishing fleet, which often operates on a marginal budget and fails to insure many of its vessels. This situation, combined with the refusal/inability of a large percentage of marine vessels of all classes to take advantage of optional oil pollution coverage, should be of considerable concern to both government officials and citizens in Hawaii.

Hawaii's commercial fishing fleet reportedly consists of approximately 1,500 vessels (Hamm and Quach 1989) of which 525 boats were considered full-time commercial or charter boat fishing operations in 1989. The majority of boats take part in the troll, handline and longline fisheries, working out of Honolulu Harbor and Kewalo Basin. Lack of berth space, wafer thin profit margins and fisheries, with the exception of pelagic tunas, that are currently operating near and in some cases beyond maximum sustainable yields, suggest the fleet will not grow significantly in the near future (LMR Fisheries Research 1992).

A large majority of local commercial fishing vessels are under 100 feet long. Many of these are multipurpose vessels (i.e., those capable of entering more than one fishery) and range in length from medium (40 to 75 feet) to large (longer than 75 feet). Most of these vessels carry between 5,000 to 20,000 gallons of fuel.

In May 1995 at least 55 large commercial fishing vessels were operating out of Hawaii, essentially all of them multipurpose vessels participating in the longline, *aku*, bottomfish and lobster fisheries. These are generally newer, steel-hulled vessels are as long as 110 feet (Pooley 1993 and pers. comm.) and average 80 to 90 feet in length. Fuel capacities range up to 40,000 gallons, averaging between 20,000 and 25,000 gallons (State of Hawaii Department of Land and Natural Resources 1979; Rusty Nall, Pacific Environmental Co. pers. comm.).

Recently, several owners of large foreign longliners inquired into the feasibility of basing their operations out of Hawaii, possibly by buying some of the NWHI longline permits made available in 1994. Lucas and Iversen (1992) speculated that "many more than 30 of these could eventually be homeported in Honolulu." Most of these longliners have capacities of 100,000 gallons or more (Rusty Nall, Pacific Environmental Co., pers. comm.).

Charter fishing vessels are fewer in number and smaller in size and fuel capacity than those in the commercial fleet. There are approximately 175 charter vessels in operation today and they range in length from 20 to 59 feet, with an average length of 36 feet. Fuel capacity averages about 500 gallons, with the largest boat being capable of carrying 1,600 gallons.

Recreational vessels are estimated to number 12,690. About 90% of Hawaii's recreational boats have lengths of 24 feet or less, while the rest range from 25 feet to more than 100 feet in length. The small- to medium-sized boats generally use inboard/outboard motors and 5–20 gallons of fuel. The few larger recreational boats have capacities which range up to about 1,200 gallons and average approximately 500 gallons.

Most commercial tour boats operate out of Keahi Lagoon, Honolulu Harbor, and Kewalo Basin on Oahu, and Lahaina on Maui (Markrich 1990; U.S. Dept. of Transportation 1992). They vary in size, type and composition, and cannot be easily characterized. Fuel capacity in tour boats varies from about 100 gallons for the smaller tour boats to 1,600 gallons for the *Starlet*, 6,000 gallons for the *Navatek* and 25,000 gallons for the *Star of Honolulu*. Glass bottom boats have surprisingly small tanks – the *Holoholokai*, perhaps the largest in Hawaii, has a capacity of only 120 gallons.

Hawaii's fleet has a number of cargo vessels, tugs, and berthing space for three large cruise liners. The largest cruise vessel to call at Honolulu Harbor is the *Queen Elizabeth II* which carries 3.3 million gallons of fuel. Container vessels can carry as much as 882,000 gallons of fuel, while the largest tug in the state, the *Niolo*, carries 120,000 gallons of fuel.

Marine Spills in Hawaiian Waters

The U.S. Coast Guard reported 557 oil spills around the state in 1990, up 200% from 1980. Most of these spills were small, from 10 to 100 gallons, but in some instances, fairly minor spills have generated major problems and cleanup costs: 120 gallons of crude oil from a Barber's Point spill in 1984 was sufficient to close 20 miles of beach on Kauai, requiring six days and \$150,000 to clean up. The Coast Guard is unable to report what percentage of the 557 spills from 1990 involved marine vessels, but it reported 79 spills from fishing vessels in Kewalo Harbor alone in 1990, up from 40 in 1989 (*Honolulu Advertiser*, December 20, 1990:A1). Cleanup of the Kewalo spills, estimated to average between 50 and 100 gallons, cost about \$1,000 apiece. Many more spills occur elsewhere, involve other types of vessels, go unreported, or have uncertain sources.

Oil Pollution and Insurance for Nontank Vessels

OPA 90 requires that responsible parties for any vessel over 300 gross tons must "establish and maintain . . . evidence of financial responsibility sufficient to meet the maximum liability" to which it could be subject in the event of an oil spill. However, OPA 90 places no such requirements on owners of vessels smaller than 300 gross tons, nor does the State of Hawaii.

Hawaii has no limits at present on oil spill liability except for interisland tankers (Rappa and Moravcik 1992). Yet a significant majority of the commercial fishery fleet in Hawaii does not carry pollution insurance, or indeed insurance of any kind. Karl Samples (1982) found in 1982 that nearly 75% of Hawaii's fishing boat owners responding to surveys had no vessel insurance coverage whatsoever. Furthermore, while Samples found that by far the majority of insured respondents had both hull and liability insurance, it is likely that a much smaller percentage would opt for pollution insurance. A majority of uninsured respondents (77%) cited the high cost of insurance as the main factor prohibiting coverage, while 11% did not feel insurance was necessary and 6% had been rejected as bad risks (Samples 1982).

John Grosseto, of John Grosseto Marine Insurance Inc., one of the larger marine insurance agencies in Hawaii, estimates that much more than half of the commercial fishing fleet is totally uninsured, while half or less of those who are insured have also bought pollution insurance, which is optional under OPA 90 for nontanker vessels smaller than 300 gross tons.

There may be a need for Hawaii to address a potential gap in its measures protecting the state from damage due to oil spills by vessels not adequately covered by OPA 90. In the event of an oil spill, if the owner of a nontank vessel with no insurance coverage does not have sufficient cash reserves, the Coast Guard or the state is responsible for the cost of the cleanup.

Recommendations

A large proportion of nontanker vessels in Hawaii — particularly those of the commercial fishing fleet — are without any insurance at all, much less any oil pollution coverage. Damage to such uninsured vessels which results in oil spilled into Hawaiian waters often forces the federal or state governments to foot the bill for cleanup costs, recovery of which can be problematic at best.

1. **The State Department of Transportation should have a requirement for pollution insurance for vessels with over 10,000 gallon fuel capacity.**

Vessels which could potentially cause medium-sized oil spills should be required by the state to carry pollution insurance. Oil spills of this size and larger could cause considerable damage to nearshore environments and high costs of cleanup. Many vessel owners have few assets outside their vessel and gear, and would not be able to pay for oil spill cleanup or restoration of natural resources damaged by a spill.

2. **Reinstate the recently discontinued registration/documentation program for marine vessels or establish a vessel registration for commercial fishing vessels.**

A registration/document program can allow the state to require inspections of the seaworthiness of commercial fishing vessels. Other types of commercial vessels are required to be registered either with federal or state authorities. The state should require insurers of marine vessels to undertake a full survey of a boat's seaworthiness as a prerequisite for insurance, and should set guidelines as to what constitutes a thorough survey.

3. **The State Department of Land and Natural Resources should institute an oil spill educational program for recreational boaters.**

Many of the oil spills reported are from recreational crafts. Most of the 12,690 recreational vessels have very small fuel capacities. Requiring insurance or inspection is simply not cost effective at this size. Many boaters are just not aware of the consequences of spilling oil in the marine environment or are unfamiliar with laws prohibiting spills and the penalties violators face. A broad based educational program aimed at recreational boaters would be more beneficial than insurance or inspections. The Washington State Sea Grant College Program has instituted an educational program for oil spill prevention for recreational boaters. Perhaps a similar program could be instituted here through the Hawaii Sea Grant College Program or the Coast Guard Auxiliary.

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