

Regional Citizens' Advisory Council

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New federal rule yields escort changes

Additional escorts, tighter wind restrictions and changes in escort configuration for single-hull laden tankers took effect Nov. 17, under shippers' plans approved by the U.S. Coast Guard. The plans also hinted broadly that new tugs – possibly including tractor tugs, as recommended by RCAC – will eventually be used in the Valdez Narrows.

The changes are the result of a new federal rule and a two-year study of disabled tanker towing conducted jointly by RCAC, industry and regulatory agencies. The new federal rule requires that escorts be able to control a disabled tanker and keep it from grounding.

More conservative closure limits and additional escorts through the Narrows should provide a greater margin of safety, based on the findings of the Disabled Tanker Towing Study, which produced new information about escort capabilities in Prince William Sound.

RCAC President Stan Stephens said the changes are a significant step forward in spill prevention.

"There's no question in my mind that these changes will make oil transportation a great deal safer," he said. "It's no secret that we don't always agree with industry and over the course of the Disabled Tanker Towing Study we've had our share of conflicts. All that aside, this has really worked. Industry and the Coast Guard should be congratulated. The public and Prince William Sound are well-served."

Valdez Narrows

In the Valdez Narrows, all single-hull laden tankers travel at 5 knots and have two

Continued on Page 3

Towing study key to changes

A major factor in the changes in tanker escorts was a two-year study of tanker towing in Prince William Sound initiated by RCAC. The Disabled Tanker Towing Study found that equipment and operating procedures that had been in use could not keep a disabled tanker from grounding in certain extreme situations. The study was conducted as a joint project of RCAC, industry groups and regulatory agencies.

The study revealed ways to improve the effectiveness of towing and assist capabilities through changes in equipment and operating procedures.

Those changes include slower tanker speed, more conservative wind restrictions, using more and different types of tugs – including tractor tugs – in different configurations, and adjusting tanker lanes in some areas to provide more maneuvering room.

The scenarios in which existing escorts could not save a disabled tanker were either

Continued on Page 5

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— Stan Stephens

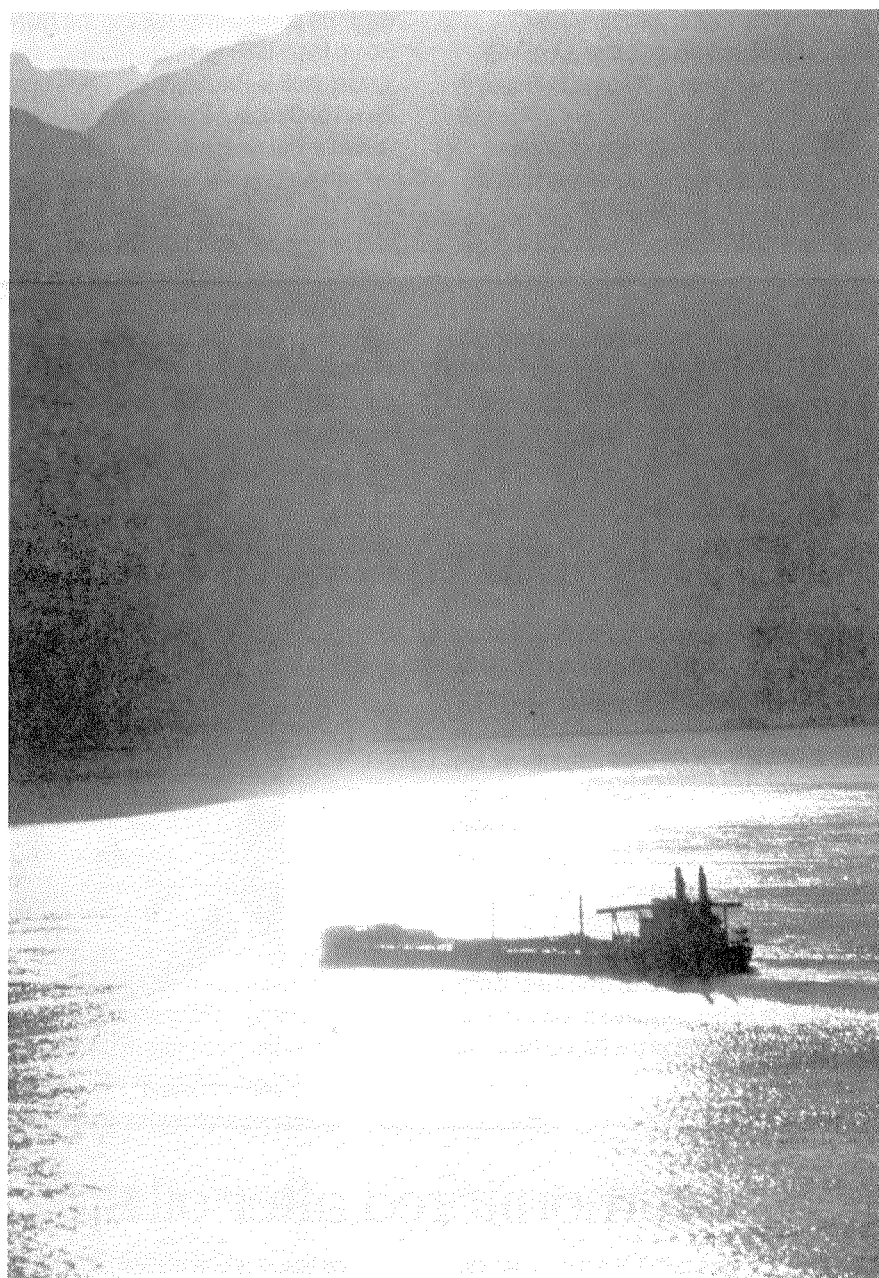
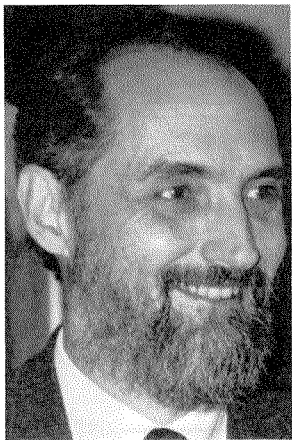


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People



Kelley Weaverling



Jim Cloud



Keith Gordaoff

New directors seated

Two new faces have joined the RCAC Board of Directors and a familiar one has returned. Jim Cloud was appointed by the Alaska Chamber of Commerce to represent Prince William Sound tourism interests on the RCAC Board of Directors.

Cloud is vice president at National Bank of Alaska, where he is responsible for equipment leasing and corporate finance programs. Cloud is also a public-at-large member of the Exxon Valdez Trustee Council Public Advisory Group. Originally from Montana, Cloud first came to Alaska in 1976.

Charles Kelley Weaverling of Cordova was appointed to represent environmental interests through the Oil Spill Region Environmental Coalition. The coalition is composed of six environmental organizations.

Weaverling served one term as Mayor of Cordova, where he owns a bookstore. After the Exxon Valdez oil spill, he organized and operated a wildlife rescue effort.

Weaverling moved to Cordova from Anchorage in 1987. A native of California, he has lived in Alaska since 1976.

Cloud and Weaverling were seated on the board at the quarterly meeting, Sept. 29, in Homer.

Keith Gordaoff returned to the RCAC Board of Directors in July as the representative for Chugach Alaska, the Native regional corporation for the Prince William Sound area. He previously served on the RCAC Board from 1989 to 1992.

Gordaoff is President and Chairman of the Board of Chugach Development Corp., a subsidiary of Chugach Alaska. He was born in Cordova and has lived in Anchorage since 1982.

Through his work with Chugach, Gordaoff has extensive first-hand experience in oil spill prevention and response. In the mid 1970s he was an oil spill response manager in Valdez. In 1989 and 1990 he managed Chugach's work in spill response and support.

Leland takes up deputy duties

Marilyn Leland has returned from a temporary post in Washington, D.C. to take up full-time duties as deputy director of RCAC. Leland was hired by RCAC in early 1992 to handle special projects. In April 1992 she was sent to Washington under an exchange program to work in the Coast Guard's OPA 90 office. Leland was appointed deputy director in absentia in September 1993.

She returned to Alaska in September.

A former executive director of Cordova District Fishermen United, Leland was a charter member of the RCAC Board of Directors.



Marilyn Leland

Mussels monitored after oil spill

Mussel samples taken five days after the May 21 Eastern Lion oil spill showed levels of polycyclic aromatic hydrocarbons that were 50 times higher than samples taken from the same site two months before the oil spill. The mussels were collected from Saw Island, directly adjacent to Berth 5 where the oil spill occurred.

The results of the sampling were not a surprise, but it was the first time that data collected under the program have been used as a benchmark for before and after comparisons.

Saw Island is one of nine sites where mussels and sediments are collected twice a year under RCAC's Long Term Environmental Monitoring Program. The purpose of the monitoring is to provide baseline measurements of hydrocarbons present in sediments and inter-tidal mussels in Prince William Sound and the Gulf of Alaska.

The program also identifies the source of any hydrocarbons found in the samples. The nine sampling sites include both areas that were impacted and areas not touched by the 1989 Exxon Valdez oil spill.

Volunteer Profile: Dr. A.J. Paul

RCAC relies heavily on the energy, expertise and resources of volunteers. Those volunteers share some core values, such as the importance of citizen involvement and concern for environmental protection. But their interests, politics and perspectives are wide-ranging and diverse.

A.J. Paul is a patient man.

As an old-timer on RCAC's Scientific Advisory Committee (SAC), he understands first hand the value of taking whatever time it takes for volunteers to reach consensus. The slow pace of committee work can be frustrating to some, but not to Paul, a marine biologist from Seward.

"It can be a slow and painful process but consensus ultimately leads to good communications and a good product," he says. "It is slow. But you're dealing with volunteers and there's no dictator to make things happen immediately. You get a good end product, but the process by its nature must be slow."

A member of the SAC since its inception, Paul has a Ph.D. in fisheries oceanography from Hokkaido University, Japan. He earned his master's degree at the University of Alaska Fairbanks, and has been associated with the university since 1970. Since 1975, Paul has been at the University of Alaska Institute of Marine Science, Seward Marine Center Laboratory, where he works on biological oceanography, especially plankton biology, and bioenergetics of fish and invertebrates.

Paul was encouraged to serve on the SAC by Chris Gates, former port director in Seward and a past member and president of the RCAC Board of Directors.

"We are at ground zero here in Seward. Any future spills will come our way because of the prevailing current. Chris asked me to help make sure it doesn't happen again and urged me to get on SAC. I think RCAC is one of the best things that ever happened. It's so much better to have citizens in an oversight capacity. They care much more than government employees ever can."

Paul sees a vital need for RCAC to have people on the committees with institutional memory. Volunteers turn over and Paul figures he serves as a "walking encyclopedia" of what's happened in SAC. "As long as they want me I'll be there for a long time."

Paul's personal mission on the SAC has been the Long Term Environmental Monitoring Program (LTEMP), an RCAC program



Dr. A.J. Paul

"We are at ground zero here in Seward. Any future spills will come our way" — A.J. Paul

which gathers baseline data on hydrocarbons in mussel tissue and sediments. Samples are taken twice a year from nine sites in Prince William Sound and the Gulf of Alaska, reflecting the broad geographic area impacted by the 1989 Exxon Valdez oil spill.

"Over the history of oil transport through Prince William Sound, there's been no long term cohesive monitoring of the ecosystem to establish baseline data," he said. "In the past it's been stop and go, always depending on staffing levels and their area of interest. With this program we're able to look at hydrocarbon pollution in the ecosystem on a long term basis."

Paul is an unabashed proponent of continuing the LTEMP. The program isn't cheap — about \$220,000 a year — but he thinks it's essential.

"Are tankers causing pollution? There has to be some measure of that. The LTEMP looks at that in Prince William Sound and downstream. There's just no other group doing this on a sustained basis over a wide geographic area."

Project seeks to target mental health

A demonstration project using Cordova as a model for mitigating the mental health impacts of a major oil spill has received conceptual approval from the RCAC Board of Directors.

As proposed by the RCAC's Scientific Advisory Committee (SAC), the project would build on research already compiled by Dr. Steven Picou, professor and chairman of the Sociology and Anthropology Department at the University of South Alabama.

Since 1982, Picou has conducted research on the impacts of technological disasters on small communities. After the Exxon Valdez oil spill, Picou did a study relating stress levels to actual and potential loss of renewable natural resources in

communities economically dependent on those resources. Cordova, Valdez and Petersburg were used in the study, with Petersburg as the control community untouched by the spill.

The committee is recommending a \$107,000 sole source contract with Dr. Picou to develop strategies for reducing spill-related mental health problems in Cordova. If successful, the strategies would be adapted for use in other vulnerable communities.

The RCAC Board of Directors, meeting Sept. 29 in Homer, indicated it will approve the contract in December pending assurances that the project will result in a product of practical value to other communities.

Oil spill prevention

Planning begins for new weather stations in Sound

Federal officials from the National Data Buoy Center were in Valdez in October to begin mapping plans for new weather reporting equipment in Prince William Sound.

The National Data Buoy Center is an agency of the National Oceanic and Atmospheric Administration (NOAA). NOAA received a \$500,000 appropriation to pay for several new weather stations and relocation of some existing equipment. The appropriation was approved by Congress in August and signed by President Clinton in October.

The new equipment is expected to be installed in spring 1995.

The weather stations, essentially monitoring equipment, will make vessel traffic safer by providing the U.S. Coast Guard and mariners with better and more timely information about conditions in Prince William Sound.

Currently, there are no weather stations between Potato Point, in the Valdez Narrows, and Middleton Island, about 100 miles away in the Gulf of Alaska. Weather conditions can vary significantly between Port Valdez and the open waters of the Gulf of Alaska, and those conditions can change quickly. Yet without equipment to provide real-time weather information, tankers frequently sail "blind," in the sense that they have no way of knowing the conditions between Potato Point and Middleton Island.

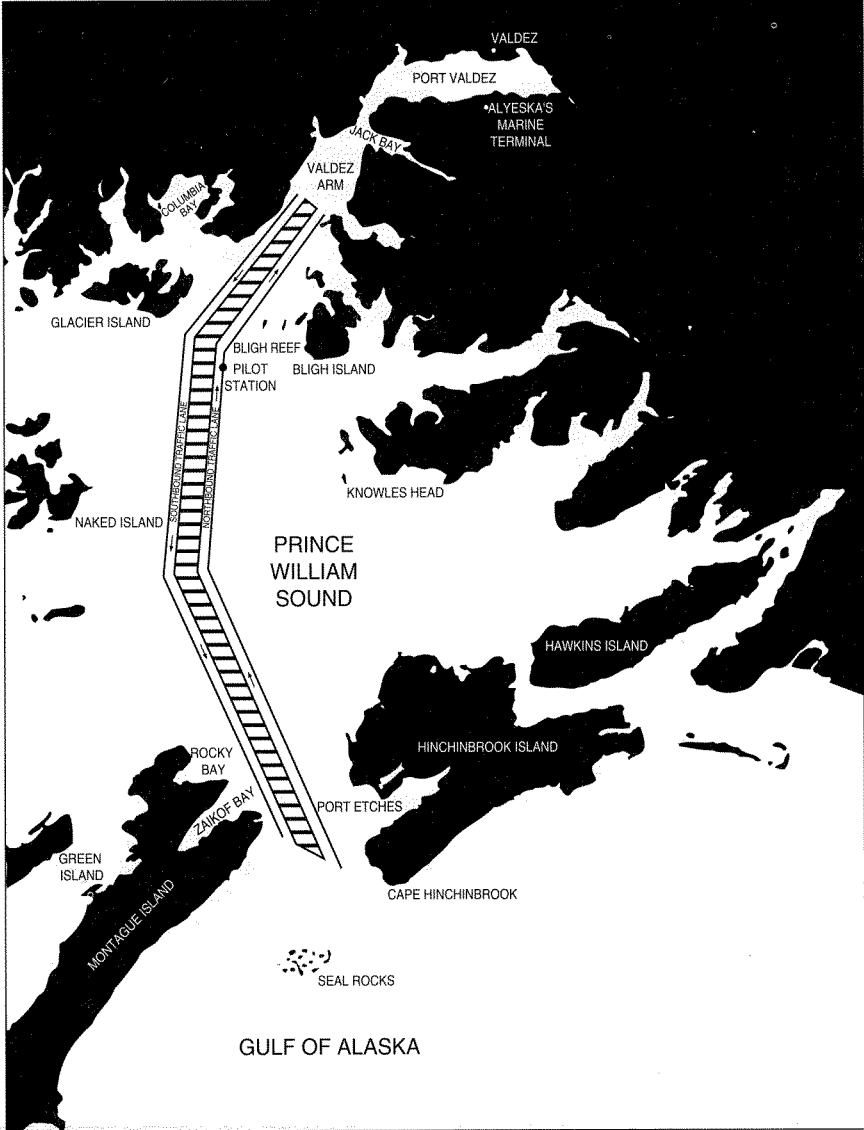
Plans include two weather buoys, one at Hinchinbrook Entrance near Seal Rocks and

one in the center of Prince William Sound. Each buoy will have equipment to measure wind speed and direction, barometric pressure, wave height and period, and air and water temperature. Equipment will also be installed near Bligh Reef to measure wind speed and direction, barometric pressure and air temperature. In addition, existing monitoring equipment will be upgraded at Potato Point.

Data collected by the monitoring equipment will be relayed by satellite to Virginia, where it will be verified, monitored and sent back to Valdez and Anchorage by teletype. The buoy will sample for eight minutes every half hour and transmit after each sampling. Data will arrive in Valdez about 10 minutes after it is collected.

The appropriation caps two years of efforts by RCAC to fill gaping holes in weather information now available in the Sound. RCAC was joined by industry groups, communities, interest groups and regulatory officials in calling for the federal funding. RCAC President Stan Stephens said the unified voice was effective.

"We succeeded because we worked together toward a common goal. It has been a clear demonstration that citizens, industry, and regulators can form effective partnerships," Stephens said. He also praised Alaska Sen. Ted Stevens for helping to shepherd the measure through Congress.



Changes increase margin of safety in tanker transits

Continued from Page 1

escorts, one of which is a tug tethered to the stern to act as an auxiliary rudder.

Larger tankers (150,000 DWT and up) must have a third tug escort when winds exceed 20 knots. In winds of more than 30 knots, the Narrows are closed to larger tankers.

Smaller tankers (less than 150,000 DWT) must have a third tug escort when winds in the Narrows are higher than 30 knots. At 40 knots, the Narrows are closed to all tankers.

RCAC had recommended to the Coast Guard and shippers that 7600 hp tractor tugs be tethered to laden tankers through the Narrows. Tractor tugs are more maneuverable, and at higher speeds more effective, than conventional tugs at controlling a disabled tanker.

The Coast Guard's Marine Safety Office (MSO) in Valdez is responsible for determining whether the shippers' plans comply with the new federal rule. MSO Valdez will not require shippers to use specific types of equipment, i.e. tractor tugs, if other combinations of equipment and operational procedures can meet the rule's performance requirement.

Valdez Arm

In Valdez Arm, tankers will travel with a tethered rudder tug when weather and sea conditions make it safe to do so. When tethering isn't safe, an emergency escort hawser will be deployed from the stern of the tanker to facilitate quick hook up and towing, if needed.

In addition, at all times tankers will slow to 8 knots in the vicinity of Buoy 9, a narrow area of the arm.

As vessel traffic permits, the Coast Guard will manage traffic so that tankers can move into the separation zone when winds are strong from the southeast.

Hinchinbrook Entrance

Closure limits have also been tightened in Hinchinbrook Entrance. Hinchinbrook is now closed to outbound laden tankers when winds exceed 45 knots or seas exceed 15 feet. The prior wind limit was 60 knots.

Tug escorts

The shippers are now matching tug escorts to the tankers, so that larger tankers are escorted by larger tugs. Before, whichever tugs were available were assigned to tankers regardless of size. The major shippers have also committed to providing new tugs for Prince William Sound in the future, and tractor tugs would be an obvious option. More powerful tugs might allow tankers to move in higher wind conditions than the tugs now in service.

The changes do not address all areas included in the Disabled Tanker Towing Study. For example, there still are no wind restrictions in central Prince William Sound. RCAC has recommended the central Sound be closed to laden tankers when winds exceed 40 knots or seas are more than 11 feet.

'Human factors' issues identified

Nine issues have been pinpointed for further study in efforts to tackle the human factors that frequently cause maritime accidents in Alaska. The nine issues were identified through surveys with 40 members of the Alaska maritime community, under a research project conducted for the Cook Inlet and Prince William Sound Regional Citizens' Advisory Councils.

Since 80 percent of transportation accidents are caused by human error, efforts to prevent oil spills must address human factors. The purpose of this project was to narrow down, for further study, specific human factors issues of most significance in Alaska.

The results of this study are expected to be used by a State of Alaska panel, the Hazardous Substance Spill Technology Review Council, in more comprehensive research into human factors issues.

The initial study for the two citizens' councils was conducted by Thomas F. Sanquist, Battelle Seattle Research Center, and Martha R. Grabowski, Rensselaer Polytechnic Institute. They divided the nine issues into two broad categories: those that relate to individual human operators, and those that are a function of an organization or system.

The individual human issues are: personnel skills, resources and certification; fatigue; automation and technology; and training. The organization or system issues are: changes in the maritime industry; individual and organizational behavior; policies and regulations; oil spill response; and facilities and inland marine transport.

The Hazardous Substance Spill Technology Review Council is expected to award contracts for human factors research in December.

Individual human issues

- Personnel skills, resources and certification
- Fatigue
- Automation and technology
- Training

Organization or system issues

- Changes in the maritime industry
- Individual and organizational behavior
- Policies and regulations
- Oil spill response
- Facilities & inland marine transport

Tanker escorts

Why tractor tugs?

RCAC believes tractor tugs tethered to a laden tanker through the Valdez Narrows would provide the greatest margin of safety for keeping a disabled tanker from grounding.

There are several differences between tractor tugs and conventional tugs. The propulsion and steering systems are aft on the conventional tug, but located forward on the tractor tug. The tractor tug also has a large skeg under the centerline of the hull aft. There are two types of propulsion on tractor tugs: cycloidal and rotatable thrusters with screw propellers. RCAC is recommending a 7600 hp cycloidal propulsion tractor tug.

Tractor tugs are more effective than conventional tugs at controlling a tanker at higher speeds. At 6 knots, a tractor tug generates steering forces approximately 50 percent greater, and retarding forces about 43 percent greater than a conventional open-propeller tug of equal brake horsepower (BHP).

Conventional tugs apply maximum force on a centerline forward and aft, but a tractor tug can apply force in any direction ("Thrust Vector Comparisons," lower right.)

Conventional tugs apply only direct force, while tractor tugs can also exert force on the tanker indirectly. In the indirect mode, a tractor tug positions its hull perpendicular to the tow line and uses the waterflow to exert force, much like a water skier veering off to the side or a downhill skier turning and carving to a quick stop.

Tractor tugs are not necessarily the tug of choice for all situations. For example, at very slow speeds – 4 knots or less – conventional tugs actually provide more force.

Rescue Scenarios
The Disabled Tanker Towing Study compared the ability of tractor tugs and

conventional tugs to control the drift of a tanker disabled in Valdez Narrows with propulsion loss and a hardover rudder failure. Several factors affect the ability of the tug to control a disabled tanker before it enters the "red" or danger zone: wind speed, tanker speed, tanker size, tug configuration, time delay (30 or 60 seconds) to recognize the problem, and time delay (30 or 60 seconds) to call for assistance.

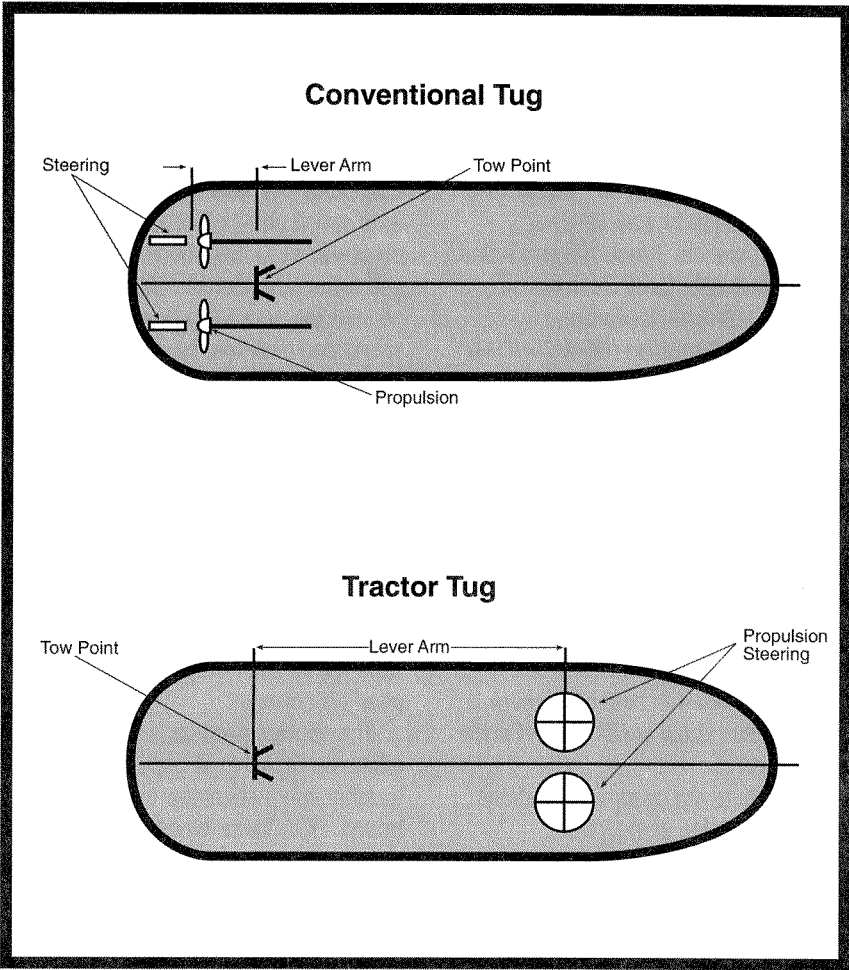
In each of the scenarios pictured below, a laden 265,000 dwt tanker is traveling at 6 knots through the Narrows in 30 knot winds. The goal was to take control of the drifting tanker before it entered the red zone, which in this case is 300 yards off the optimum track line.

In the computer simulations, if the tanker drifted more than 300 yards off the optimum track line before it was brought under control, the rescue was considered a failure.

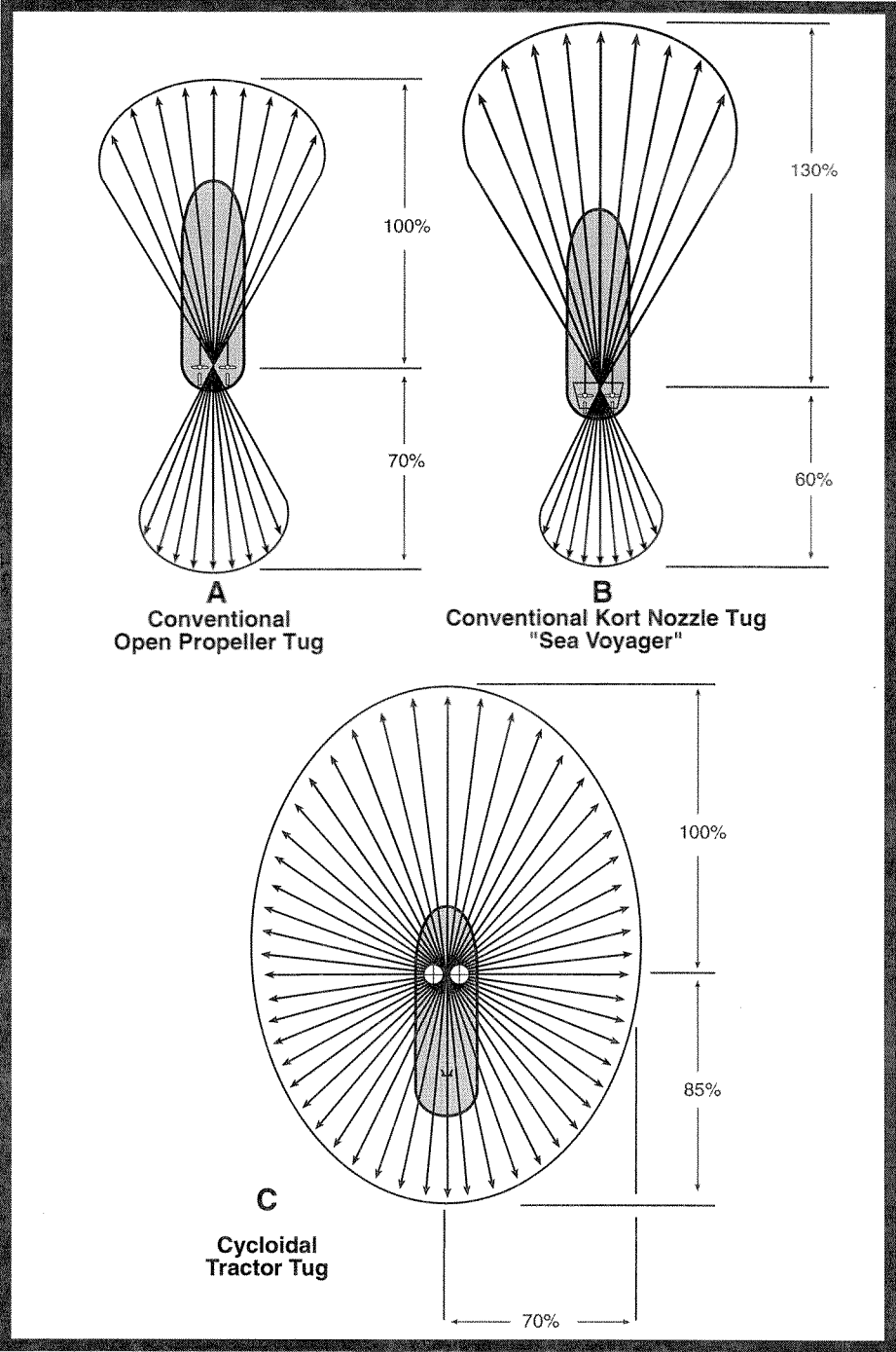
The tractor tug successfully kept the tanker out of the red zone in two of the scenarios depicted here. In all three scenarios, the tractor tug was able to control the tanker in half the distance of the conventional tug.

Major shippers proposed to solve the problem by using conventional tugs and slowing tankers to 5 knots through the Narrows. According to computer simulations, at 5 knots the conventional tug performs almost as well as the tractor tug and both are able to keep the tanker out of the red zone.

Even at 5 knots, RCAC believes the tractor tugs provide a significantly greater margin of safety because there are times when weather conditions will require a tanker to speed up, overriding the 5-knot limit. Another problem is that the 5-knot solution assumes peak human performance all the time; RCAC believes that is unrealistic.



Conventional and Tractor Tugs



Thrust Vector Comparisons of Conventional vs. Tractor Tugs

Rescue Scenarios Valdez Narrows

All scenarios: 265,000 DWT tanker traveling at 6 knots in 30 knot winds

Scenario #1 - 60 sec., 60 sec., 35 degree rudder
Scenario #2 - 30 sec., 60 sec., 35 degree rudder
Scenario #3 - 60 sec., 60 sec., 20 degree rudder

X - Tractor Tug **O** - Conventional Tug

Optimum track line	#1	#2	#3
100 yds.			
300 yds. - RED ZONE		X	X
			O
600 yds.	X	O	
900 yds.			O

Tanker escorts

RCAC recommends slew of safety improvements

In addition to recommending use of tethered tractor tugs through the Valdez Narrows, RCAC recommended:

- Use of an ocean-going salvage tug, 22,000 HP or larger, in the approaches to Seal Rocks.
- Continuous escort of tankers through Prince William Sound be maintained.
- Closure conditions in central Prince William Sound of 40 knots of wind or 11 foot seas.
- Closure conditions for outbound laden tankers at Hinchinbrook Entrance be revised to 40 knots of wind or 11 foot seas.
- Expedited use of federal funds appropriated for weather reporting stations in Prince William Sound, including a weather buoy that reports the wind speed and wave height in Hinchinbrook Entrance and Seal Rocks area.
- A licensed engineer be stationed in the steering flat for the duration of the transit through the Valdez Narrows to take immediate action, if necessary, in the case of a steering failure. This individual must be in communication with the bridge and the engineer on watch.
- Tanker pilots, tanker masters, and escort masters be briefed on the capabilities of the braking maneuver, a rudder tug, and a European style tether.
- Removal of the dog leg in the traffic lanes east-northeast of Smith Island.
- The Vessel Traffic System manage traffic so as to allow outbound laden tankers to have maximum sea room at Hinchinbrook Entrance.

Shippers' proposals endorsed

RCAC endorsed several recommendations made by the Prince William Sound Tanker Association:

- Extend the one-way zone in Port Valdez to the 146 - 35 W meridian to prevent close quarters meeting situations at the northern entrance to the Narrows.
- Relocate the pilot station two miles south of the present location and establish a precautionary zone. This will allow the pilot to be on the bridge during the turn at Bligh Reef and during the transit of the potential ice area.

• Put a tug on standby at Cape Hinchinbrook until tankers have proceeded to a position 17 miles past Seal Rocks.

- Extend the Traffic Separation Scheme beyond Hinchinbrook Entrance 17 miles to create an orderly and separated traffic flow.

Transit speed in Narrows

RCAC also raised concerns about transit speeds in the Valdez Narrows. Computer simulations in the Disabled Tanker Towing Study indicated that slowing tankers from 6 knots to 5 knots through the Valdez Narrows would make a significant difference in the ability of a tethered escort tug to effectively control a disabled tanker. In response to that, SeaRiver Maritime (formerly Exxon Shipping) last spring slowed its tankers to 5 knots through the Narrows, and ARCO and BP proposed to do the same.

RCAC raised concerns about the 5 knot solution. In the past, concerns have been expressed in the ship handling community about the maneuverability of tankers traveling at 5 knots. Further, the 5 knot rescue scenario in the study, using tethered existing equipment, succeeds at most wind speeds only when reaction and response times total no more than 90 seconds. At 120 seconds successes are limited. RCAC believes the 5-knot solution relies too heavily on an unrealistic expectation about human performance.

RCAC also pointed out that de facto, the 5-knot solution works at most only so long as the tanker does not exceed 5 knots. In fact, there are situations in which it is safer for the tanker captain to speed up the vessel, such as when wind speeds increase. In those situations, any margin of safety gained is lost.

RCAC's Port Operations and Vessel Traffic Systems (POVTS) Committee, which handled the towing study, will also investigate the cost and feasibility of additional computer simulations modeling two tractor tugs in Valdez Narrows and Hinchinbrook Entrance, a tractor tug towing at the bow in Valdez Arm, and a tractor tug escorting on the starboard bow in Hinchinbrook Entrance.

Coast Guard finalizes rule for tanker escorts in Sound

Escort vessels that accompany laden oil tankers through Prince William Sound will be held to specific performance standards, under a new federal rule effective Nov. 17. The final rule on escort vessels for Prince William Sound and Puget Sound requires two escort vessels accompany each laden single-hull tanker, but a double escort has been standard practice in the Sound since 1989.

The rule stems from the Oil Pollution Act of 1990, which mandated specific escort rules for Prince William Sound and Puget Sound. Escort requirements for other areas will be addressed under a separate rulemaking.

Under the performance standards for Prince William Sound and Puget Sound, the escort vessels must be able to:

- tow the tanker at 4 knots in calm conditions and hold it steady against a 45-knot head wind;
- hold the tanker on a steady course against a 35-degree locked rudder and a speed of 6 knots, in the same distance it could turn itself with a hard-over rudder; and
- turn the tanker 90 degrees, assuming a free-swinging rudder and a speed of 6 knots, within the same distance the tanker could

turn itself with a hard-over rudder.

The final rule had included a requirement that escorts be able to stop the tanker in the same distance it could crash-stop itself from a speed of 6 knots, using its own propulsion system.

The "crash-stop" requirement was suspended because of concerns about whether it could be done safely for diesel-powered tankers. Compared to those tankers powered by steam, the diesel-powered tankers have superior reversing power and thus would have required attaching additional tugs to equal its own propulsion capability. The Coast Guard is reviewing the issue and will decide it separately. Public comment will be taken on the crash-stop issue through January.

The final rule also requires pre-escort conferences between the tanker master, the pilot and the masters of the escort vessels regarding the escort operation.

Pre-escort conferences must include discussion of anticipated conditions, types of equipment available on the tanker and escort vessels, positioning of the vessels, possible pre-tethering of the escorts and methods to be used for emergency towline connection.

Tanker towing study brings changes, increases safety

Continued from Page 1

"worst-case" or a few notches down from "worst case," in that they assumed a combination of factors. The actual risk of those scenarios – the likelihood of them happening – is not known and assessment of that risk was not part of the study. However, worst case is normally considered very unlikely. For example, many of the scenarios assumed a hard-over rudder failure at 35 degrees, but rudders are rarely turned more than 20 degrees.

Part 2 of the study – Part 1 was released last year – ran computer simulations to determine the effectiveness of towing and assist to a tanker disabled under a variety of scenarios, locations and conditions.

The following factors were used: tanker size, wind speed, tanker speed, distance from hazard, time it takes crew to realize the failure, time it takes to notify the tug, failure rudder angle (35 or 20 degrees) and assist vessels (type, number and configuration). The study looked at disabled tanker issues in five locations: the Valdez Narrows, Valdez Arm, center of Prince William Sound, Hinchinbrook Entrance and Gulf of Alaska.

The study was important because it provided information bearing directly on a new federal escort rule effective Nov. 17. Under the new federal rule, single-hull laden tankers in Prince William Sound and Puget Sound must be accompanied by two escort vessels capable of controlling the tanker in the event of steering or propulsion equipment failure. The rule also describes what the escort vessels must be able to do. The

study provides much of the information needed to determine the performance capabilities of different equipment and operating systems in various conditions and geographic areas.

The study is also likely to influence state requirements. State regulations require that the "best available technology" be used in tanker escorts. Until now, the Alaska Department of Environmental Conservation (ADEC) has not tried to define "best available technology." The towing study has provided an impetus to do so because of the information it contains about the effectiveness of different escort vessels and equipment to prevent a disabled tanker from grounding. Information from the study may also result in changes to other response planning standards.

Coincidentally, the ADEC is now reviewing shippers' spill response plans (see story, Page 6) and the new information gained from the towing study will likely be used to judge the adequacy of the tanker plans.

The Disabled Tanker Towing Study was begun in September 1992 as a joint project of the Prince William Sound Tanker Association, the Prince William Sound Regional Citizens' Advisory Council (RCAC), the U.S. Coast Guard, Alaska Department of Environmental Conservation and Alyeska Pipeline Service Co. The study cost \$660,800, of which RCAC contributed \$405,000. In-kind contributions, especially of tanker and escort vessels to conduct the sea trials, raised the real cost to more than \$1 million.



The escort response vessel Heritage Service accompanies an outbound laden tanker.
(File photo courtesy Alyeska Pipeline Service Co. copyright 1989 David Predeger.)

Response and planning

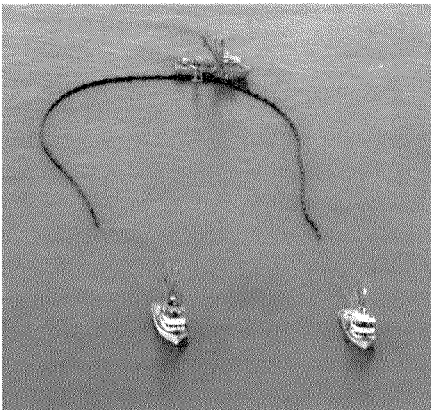
Arco conducts first drill of nearshore response

Arco Transportation Inc. was showered with across-the-board praise for its willingness to take risks by testing several new concepts in a major drill. The three-day drill, Sept. 19-22, was the first to test nearshore response and the first to test just one specific segment of a response.

Other firsts were Arco's departure from the Incident Command System, in favor of a military style management system called command, control and communications. Arco also used a joint information center to gather and disseminate information and tried out a new community response plan.

"Nearshore response" is containment and recovery of oil that has escaped initial containment and threatens sensitive coastal areas. A plan for nearshore response is required as part of shippers' oil spill contingency plans for Prince William Sound. The concept of nearshore response emerged from the Exxon Valdez oil spill and uses local fishing vessels and their crews to deploy boom and contain the oil.

The purpose of drills is to train people and



Fishing vessels deploy boom during the nearshore response drill in September. (Photo by Arco Marine/Kevin O'Shea.)

identify where changes or more work is needed. Although a formal evaluation of the drill has not been completed, RCAC and other observers agree about a few key points.

- The physical demonstration of the Nearshore Response Plan's response strategies and techniques was carried out.

- The fishing vessels and crews performed very well as did the *Responder*, the main barge for nearshore response.
- The Joint Information Center worked very well as a central, integrated source of factual information about the response effort.
- Hatchery protection and the Duck Flats exclusion boom still took much too long – 12.5 and 15 hours respectively – for effective protection of the two sensitive areas.
- While the concept of drilling a portion of the contingency plan was well founded, isolating one element created problems. The drill assumed that the initial response had already occurred, but drill participants did not have specific starting points from which to move forward.
- The management structure of command, control and communications might work well if everybody followed it, but since ICS is used by the federal agencies and Alyeska, Arco should not insist on using a different system.
- Decentralized decision-making, with more latitude and authority within each

command section and on-water, was effective. Distributing unified command personnel from regulatory agencies throughout the command sections also contributed to more efficient and effective operations.

- Arco did not take advantage of Alyeska's SERVS resources and communications between Arco and Alyeska personnel was poor.
- Even though this was only a limited response, VHF radio channels were almost always full during the drill. This type of communications problem occurs at nearly every major drill.
- All participants took the drill debriefing seriously and came up with meaningful, honest, constructive criticisms during the initial debriefing.
- Arco had a positive attitude throughout the exercise, which helped it overcome problems and regain control of its response management.
- Arco was very receptive to independent verification through the entire exercise.

In-situ burning experiment conducted at Prudhoe Bay

by Lisa Tomrdle, Project Assistant
Oil Spill Prevention & Response Committee

The largest experiment to date in burning of emulsified oil was conducted Sept. 8-11, at Prudhoe Bay. The test burn was conducted by Alaska Clean Seas, a non-profit oil spill cooperative, to study the burning characteristics of emulsified oil, which is oil that has aged and absorbed water.

Prince William Sound Regional Citizens' Advisory Council (RCAC) was one of several private and government organizations that participated in and supported the experiment.

Alaska Clean Seas was pleased with the results. "In general we feel that we successfully met all of the goals of the project and have provided a foundation for the acceptance of in-situ burning as a response option equal to mechanical containment and recovery," General Manager Glen Doughty said.

The primary goal of the 1994 Emulsion Burn Experiment was to develop burning of highly weathered and emulsified crude oils as a response tool. The experiment entailed three burns, two of emulsified oil and one of

fresh Alaska North Slope Crude. The burns were conducted in a lined 90-foot square pit at the Fire Training Grounds at Prudhoe Bay. The burn area was confined to a 36-foot diameter area contained by 3-M fire boom. Approximately 80 barrels of emulsified oil or fresh oil was added to fresh water in the pit. For the first burn, Alaska Clean Seas used 50 percent salt water in oil emulsion and for the third burn they used 60 percent salt water in emulsion.

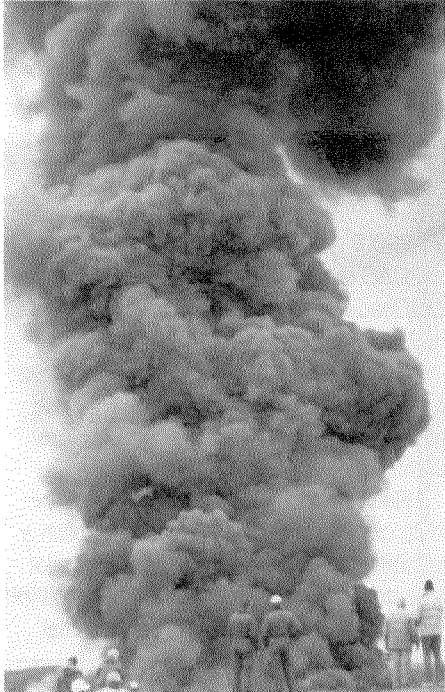
Each burn lasted less than an hour. All three burns showed high oil removal efficiencies of above 95 percent, meaning that less than five percent of the oil remained after burning. The first burn of 50 percent was interesting in that the fire continued to nearly extinguish itself and then flare up again. Scientists observing the burn said this was a characteristic they had witnessed before with emulsion burns but had not concluded why it occurred with this particular burn. The burn of 60 percent salt water in emulsion did not demonstrate this behavior and burned with a steady fire.

The burns left residue ranging from 227 pounds to 467 pounds (1.6 percent to 3.3 percent of the original oil by weight), which

sank almost immediately after the fires burned out. The scientists had not observed the residue sinking in smaller pan tests conducted earlier in the summer. Alaska Clean Seas plans to further analyze the burn residue.

Scientists are continuing to study the air quality data collected from the smoke plume. The Alaska Regional Response Team has set a human health standard of exposure to smoke particulates from an in-situ burn at 150 micrograms/cubic meter averaged over one hour which is considered to be a conservative limit. In-situ burning must be authorized by the Regional Response Team, which includes representatives of the U.S. Coast Guard and the U.S. Environmental Protection Agency.

Alaska Clean Seas plans to develop a public education video about in-situ burning. The video is expected to be ready for distribution in January, 1995. A technical air quality report on the experiment is expected to be completed by April, 1995. All reports and the public education tools will be provided to the RCAC as a sponsor of the burn.



Emulsion composed of 60 percent salt water burns steadily during the experiment conducted by Alaska Clean Seas. (Photo by Lisa Tomrdle.)

State officials buried in new oil spill contingency plans

The Alaska Department of Environmental Conservation (ADEC) is reviewing an estimated 7,000 pages of documents submitted by Alyeska and tanker operators to answer questions and fill in gaps from the original 12,000 pages submitted earlier this year. The massive documents are updated contingency plans for addressing oil spills from tankers in Prince William Sound and the Valdez Marine Terminal.

The contingency plans must describe in detail how the responsible party will respond in the event of an oil spill. Each plan lays out the equipment, resources, personnel and procedures that would be used in a spill response. Anyone identified as a potential spiller cannot operate without an approved

contingency plan. The plans are revised and reviewed every three years.

The planholders – Alyeska and shippers of North Slope Crude -- have responded to comments and requests for additional information from RCAC and regulatory agencies.

ADEC is reviewing those new submittals (the estimated 7,000 pages), but more questions may arise before the plans are actually approved. ADEC's goal had been to approve the plans by November 15, but staff shortages and the sheer quantity of documents make that goal unlikely to be realized.

Among RCAC's core responsibilities, under both its contract with Alyeska and the Oil Pollution Act of 1990, is to work with

industry and agencies on development of, and revisions to contingency plans, and to review the plans once they've been submitted to the state for approval. By doing so, RCAC seeks to insure that planning and response actions take place as required under law and as needed to protect the waters and livelihoods of citizens in the region impacted by the Exxon Valdez oil spill.

RCAC reviewed 23 contingency plans in all – Alyeska's plan for the Valdez Marine Terminal, the Prince William Sound Tanker Spill Prevention and Response Plan and 21 individual tanker plans. In its reviews, RCAC raised numerous questions and identified

sections of the plans in which information was missing, incomplete or inadequate.

A major issue that has emerged for all the Prince William Sound plans is firefighting and the state requirement that planholders use the best available technology for fire response.

Other issues raised are identification of equipment to be mobilized and deployed; identification of response resources in state waters outside Hinchinbrook Entrance; identification of response equipment outside the Prince William Sound region; how exemptions and credits are applied; and the use of best available technology for response equipment.

Air and water issues

Ballast water monitoring program underway at terminal

After a series of delays, a program is now underway to sample and analyze ballast water off-loaded from tankers calling at the Valdez Marine Terminal. The actual monitoring program began October 13 with an unannounced sampling of the tanker *ARCO Juneau*.

Preliminary samples of ballast water were collected over the summer from the tankers *Arco Anchorage*, *Brooks Range* and *Overseas Alaska*. However, those samples were used to test the quality assurance and quality control elements of the monitoring program.

The monitoring program is a joint project of RCAC and the Alaska Department of Environmental Conservation (ADEC), with funds left over from a 1991 legislative appropriation to RCAC for studies on ballast water treatment. The \$107,000 available is expected to run out by June 1995.

Although ADEC ran similar sampling through most of 1993, the agency has not budgeted to continue monitoring after this funding runs out.

Under the program, samples are taken of ballast water discharged to Alyeska's ballast water treatment facility from tankers calling at the terminal. The samples are analyzed by an independent commercial laboratory on contract to RCAC.

The purpose of the analysis is to detect any incoming materials that might not be treatable by the ballast water treatment plant, materials inappropriate for discharge at the plant, or higher than expected levels of materials approved for discharge. All data are being forwarded to the ADEC and Alyeska.

Fears have been expressed in the past that the ballast water contains unauthorized, and potentially toxic, substances.

Tankers carry ballast water in empty tanks to stabilize the vessel when it is not carrying cargo. In ships where the ballast is carried in the cargo tanks, the ballast water is contaminated by oil and other residue. When a tanker arrives at the Valdez Marine Terminal, the dirty ballast is off-loaded to the ballast water treatment facility, where it is treated

and then released into Port Valdez.

The RCAC/ADEC program tests for volatile organics, semi-volatile organics and metals in the ballast water influent. Alyeska currently conducts parallel sampling with the RCAC/ADEC program, although the company is not required to do so.

Effluent discharged from the ballast water treatment plant into Port Valdez is monitored by Alyeska, as required under its federal discharged permit. The effluent discharge flow and pH are monitored continuously.

The effluent is monitored daily for aromatic hydrocarbons (BETX), total suspended solids and total organic carbon, and quarterly for naphthalene. Alyeska also monitors the effluent twice a week for total hydrocarbons, and quarterly for recoverable zinc and individual aromatic hydrocarbons.

Under the permit Alyeska is also required to perform the following tests on the ballast water discharge:

- toxicity testing, including sublethal and acute survival tests, on organisms specified in the permit;

- biological monitoring to evaluate the effect of the discharge on the marine infauna in Port Valdez;

- sediment monitoring to determine the fate and concentrations of petroleum hydrocarbons in the sediments of Port Valdez and sediment toxicity testing with organisms specified in the permit (regulators ceased sediment toxicity testing for 1994);

- tissue hydrocarbon monitoring to determine if hydrocarbon levels in tissues of organisms specified in the permit are changing over time.

The requirements for monitoring influent are much less. Under the federal permit, Alyeska must only retain and preserve samples of ballast water influent from tankers whose ballast water contains substances other than crude oil.

Samples are analyzed at Alyeska's own initiative or at the request of ADEC or the U.S. Environmental Protection Agency.

In some cases, Alyeska monitors more than its permit requires.

Specifics of vapor control system due out in spring

Alyeska Pipeline Service Company is proceeding with engineering work on a system to control tanker loading vapors at the Valdez Marine Terminal, although important elements of the federal requirements for such systems won't be known until spring 1995.

The U.S. Environmental Protection Agency (EPA) is reviewing comments on the proposed federal requirements and is scheduled to release the final requirements in May.

Under 1990 amendments to the Clean Air Act, marine terminals must reduce air pollutants released when crude oil is loaded into tankers. Draft requirements issued by the EPA last April call for vapor emissions to

be cut 98 percent at the Valdez Marine Terminal, and for the controls to be in place by April 1997. However, these requirements could vary somewhat depending on which part of the Clean Air Act Amendments a facility is regulated under.

Some new uncertainties came into the picture in September, when the EPA reopened the comment period because of questions regarding a separate but related rule for refinery emissions. EPA is considering changes that could result in a different compliance schedule and lower reduction standards for marine loading terminals, including the Valdez terminal.

There is no longer any debate about whether vapor controls will be installed at the

terminal or even what type of system will be used. In July, Alyeska announced it would use some of the vapors to balance displaced crude removed from the tank farm. Ultimately, all of the vapors captured will be incinerated or combusted to generate electricity.

Questions do remain, however, about how many berths will be covered and when vapor controls will be installed.

Alyeska wants to install controls at only two of the three berths that will still be in use at the terminal in 1997. Alyeska maintains that the \$28 million it would cost to install controls on the third berth isn't warranted because that berth will be used only partially

for routine loading between 1997 and 2001. After 2001, Alyeska proposes to be able to use the uncontrolled berth for up to 40 days per year as a maintenance and emergency backup.

Alyeska also recommended a compliance deadline of April 1998, citing in part Alaska's short construction seasons.

In comments to the EPA on Alyeska's proposal, RCAC agreed that the April 1997 deadline would be very difficult and supported a later compliance date. RCAC opposed Alyeska's plan to leave a third berth without vapor controls unless Alyeska could still meet EPA's vapor reduction standard, even with the third berth uncontrolled.



Alyeska implements improvements following oil spill

**by Jim McHale, Business Unit Leader,
Ship Escort/Response Vessel System
(SERVS)**

After examining the *Eastern Lion* oil spill response effort, Alyeska Pipeline Service Company has acquired new equipment and instituted new tactical procedures to improve oil spill prevention and response in Prince William Sound.

There's no question the company gained insight from the *Eastern Lion* response, which began May 21, on how to better implement response strategies. A real event made Alyeska, and SERVS in particular, aware of how tactical adjustments could make our response more flexible and effective.

Rapid response at Solomon Gulch Hatchery will be enhanced by the rearranging of buoys for securing boom and the anchoring systems for the hatchery's pens

that will be completed this month.

SERVS has purchased additional boom that is being stored at the Valdez Container Dock for rapid deployment at the tidal flats.

Shallow-draft work boats to improve boom towing and tending at the hatchery and tidal flats have arrived and are stationed on the *Responder*, our nearshore response barge. This ensures on-water deployment of the work boats, which can be launched to divergent locations, making response faster and more efficient.

Several enhancements at the terminal's loading berths have also been developed. Adapter plates that attach to the mouth of a skimming vessel have been installed at Berths 4 and 5. This allows the vessel to recover oil without breaching the primary containment area, thereby preventing oil escapement.

Gates installed at Berths 3 and 4 create boom-pens for skimmers to access the

primary containment area. Skimmers enter the gate, which closes behind, and then enter the primary boom area without allowing oil to escape.

Tactics for skimmer utilization have been reassessed and a new tactical guide has been drafted. Two goals for the new procedures are to enhance skimming capability by using small skimming devices and to prevent boom entrapment.

Concerns regarding a landing craft used by divers that caused the *Eastern Lion's* boom to move too close to the tanker have been reviewed and addressed. New procedures call for the divers to access the area from a smaller vessel or directly from the tanker or berth deck.

To prevent oiling of a berth's pilings, new procedures are being developed and tested, such as pre-positioning containment boom between the pilings and the back fence-boom.

Alyeska has also tested use of a Trans-Rec skimmer barge during two exercises completed since the *Eastern Lion* response. The exercises demonstrated both the effectiveness of the skimmers and the potential danger in using a barge towed by two vessels in close proximity to a laden tanker. SERVS will take the findings of the exercises into account as operational decisions are made during a response effort.

Other improvements at the berths include replacement of back-fence boom with Ro-Boom 1500, which extends further below the waterline and is more stable, and more training for terminal oil spill crews on skimmers and other response equipment at the berths.

More than 20 terminal workers have been cross-trained by SERVS to conduct tanker booming. These personnel would provide back-up for the oil spill crew at the terminal.

RCAC

RCAC advised to improve relations with industry

The RCAC has been recertified as the federally-mandated advisory group for Prince William Sound, but the U.S. Coast Guard has put RCAC on notice that it needs to work harder to improve relations with the oil industry and regulatory agencies.

As part of the annual certification process, the Coast Guard sought comments from industry, agencies, RCAC's member organizations and the public.

In an Aug. 4 letter to RCAC, Rear Adm. J.C. Card said comments received "indicate the RCAC's relationship with industry and government in the past has been tenuous, and the RCAC has only recently begun to seriously work toward establishing the partnership mandated by the Oil Pollution Act of 1990 (OPA 90), Section 5002. We expect you to continue in this vein and to make significant gains in alleviating both real and perceived communication barriers during the coming year. Your efforts in this area will have considerable impact on future recertifications . . ."

The Coast Guard's stern position was triggered by a critical letter from Roger Gale, Vice President of BP Oil Shipping Company. RCAC responded to each of Mr. Gale's criticisms, many of which RCAC felt were the

result of misunderstanding about RCAC's responsibilities. On the other hand, RCAC has long recognized the need to develop more positive working relationships with individual shippers.

"Improving relations with the industry has been part of our long range plan for several years," Board President Stan Stephens said. "In the past 12 to 18 months we've made tremendous progress in improving communications between RCAC and Alyeska. Now that we've ironed out some of the wrinkles in that relationship, we can turn our attention to the shippers."

Stephens said that while some people might criticize the Coast Guard's position, he doesn't.

"First of all, you can't hope to be an effective advisor if the people you're advising won't talk to you and listen. It's very much in the citizens' interests that these relationships be as positive and productive as possible," he said.

"Second, the Coast Guard recognizes that any relationship takes two to make it work. We need to make the effort but so does industry and the agencies. It isn't a one-sided responsibility."

Publications, reports available

Copies of most documents are available to the public free of charge. A handling fee will be charged for unusually large documents and for requests of more than 10 documents.

Publications

- "Prince William Sound Disabled Tanker Towing Study, Part 2". Author: The Glosten Associates. *Charge: \$98.
- 1993 RCAC "Year in Review," an overview of work and activities. (Ref. #5.9.511.93)
- "The Observer," RCAC newsletter, published since 1991.(Specify issue).
- "A Voice for Prince William Sound," 10-minute video on RCAC.

Consultants' Reports (1994)

- "Alaska Maritime Human Factors Needs Assessment." Author: Thomas F. Sanquist, Martha R. Grabowski. Sept. 23, '94. (Ref. #3.9 Human Factors)
- "Saw Island Sampling," supplemental report, Long Term Environmental Monitoring Program. Author: Kinnetic Laboratories, Inc. July 6, '94. (Ref. #4.5.4009F)
- "Alyeska Planholder Responsibilities," review and analysis of Alyeska and the Prince William Sound Tanker Spill Prevention and Response Plan. Author: Richard Townsend. May 94 (Ref. #2.5.2065).
- "Third Survey Report March 6-26, 1994," Long Term Environmental Monitoring Program. Author: Kinnetic Laboratories, Inc. April 28, '94 (Ref. #4.5.4009E)
- "Annual Monitoring Report - 1993," Long Term Environmental Monitoring Program. Author: Kinnetic Laboratories, Inc. Feb. 94. (Ref. #4.5.4009D).
- "Drill Monitoring Annual Report - 1993." Review of consultant's monitoring. Author: Tim Jones. Jan. '94 (Ref. #2.5.2050)
- "Contingency Plan Program Protocols," standardized guidelines for reviewing oil spill contingency plans. Authors: Michelle Straube, Randy Bayliss and Theresa Svancara (Ref. #2.5.2046) * Charge: \$50.

Advice & Comments (1994)

- Comments to Arco Marine on nearshore response drill of Sept. 18-22. Oct. 17, '94. (Ref. #10.2.2537)
- Comments to ADEC on Prince William Sound Tanker Oil Discharge Prevention and Contingency Plans for Baltimore Trader, Chesapeake Trader and Potomac Trader. Aug. 10, '94 (Ref. A/C #2.2.2530)
- Comments to the Alaska Division of Government Coordination, request for additional information on the Alyeska Terminal Plan. Aug. 10, '94 (Ref. A/C #2.2.2531)
- Comments to EPA on proposed federal standards for marine tank vessel loading and unloading operations. July 15, '94 (Ref. A/C #1.2.1528)
- Comments to U.S. Coast Guard on proposed interim rule for financial responsibility for water pollution for vessels and the final regulatory impact analysis. Sept. 28, '94 (Ref. #2.2.2535)
- Comments to U.S. Department of Commerce (NOAA/OCRM) regarding proposed changes to Alaska Coastal Management Program. Sept.15, '94. (Ref. #2.2.2533)
- Comments to ADEC on Prince William Sound Tanker Oil Discharge Prevention and Contingency Plans. June 15, '94 (Ref. #2.2.2529).
- Comments to Alyeska regarding the Eastern Lion Oil Spill. June 3, '94 (Ref. A/C #10.2.1019)
- Comments to ADEC on the Alyeska Prince William Sound Tanker Oil Discharge Prevention and Contingency Plan. June 1, '94 (Ref. A/C #2.2.2528).
- Comments to U.S. Coast Guard on the Prince William Sound Area/Regional Coastal Zone Contingency Plan. April 8, '94. (Ref. A/C #2.2.2525)

Prince William Sound Regional Citizens' Advisory Council

The Prince William Sound Regional Citizens' Advisory Council (RCAC) is an independent, non-profit organization formed after the 1989 Exxon Valdez oil spill to minimize the environmental impacts associated with the terminal and tanker fleet.

The RCAC has 18 member organizations, including communities impacted by the Exxon Valdez oil spill, a Native regional corporation and groups representing fishing, aquaculture, environmental, tourism and recreation interests in the impact area.

RCAC is certified under the federal Oil Pollution Act of 1990 as the citizen advisory group for Prince William Sound, and operates under a contract with Alyeska. The contract, which is in effect as long as oil flows through the pipeline, guarantees RCAC's independence, provides annual funding, and ensures RCAC the same access to terminal facilities as state and federal regulatory agencies.

The mission of RCAC is citizens promoting environmentally safe operation of the Alyeska terminal and associated tankers.

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