OIL SPILL PREVENTION AND RESPONSE FOR THE TAPS TANKER TRADE IN PRINCE WILLIAM SOUND, ALASKA

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Abstract

Alyeska Pipeline Service Company, Ship Escort Response Vessel System (SERVS) is the primary response action contractor for Trans-Alaska Pipeline System (TAPS) laden tankers within Prince William Sound Alaska and an oil spill removal organization for the Gulf of Alaska. During the past seven years, SERVS has implemented a major spill prevention and response organization for this region.

The activities of the SERVS prevention and response organization include escort prevention service, spill prevention activities, response equipment, contingency planning, nearshore response, community involvement, fishing vessel program, citizen oversight and training. Plans have been made for dispersant use, in-situ burning, waste management, coastal resource and sensitive environment inventory, wildlife protection and rehabilitation and other response strategies. Response equipment and strategy updates are closely coordinated with ship operators/charters (planholders), agencies, and the public, including the Prince William Sound Regional Citizen Advisory Council.

Introduction

State and federal laws require each tanker loading oil at the Valdez Marine Terminal and transiting Prince William Sound to have an approved contingency plan, to contain and clean up an oil spill, to contract for cleanup resources and to post evidence of financial responsibility.

Alaska regulations (18 AAC 75.500-75.570) provide that an "oil spill primary response action contractor" can be obligated under contract to the holder of an approved oil discharge and contingency plan issued under Alaska State law (AS 46.04.030) to provide resources or equipment to contain, control or clean up an oil discharge. Alyeska Pipeline Service Company/Ship Escort Response Vessel System (SERVS) has been certified as an oil spill primary response action contractor by the Alaska Department of Environmental Conservation (ADEC).

SERVS Organization

The Ship Escort Response Vessel System (SERVS) organization is the Valdez-based operational unit within Alyeska Pipeline Service Company that acts as the primary response action contractor (RAC). SERVS provides marine response services on behalf of Prince William Sound tanker operators/shippers/charters who are contingency plan "planholders". The services provided by SERVS generally include escort duties and initial oil spill response. Services that are specifically provided include the duty to implement the latest update of the Prince William Sound Tanker Oil Discharge Prevention and Contingency Plan approved by ADEC in October 1995. The SERVS vision and mission statement reflects these duties and responsibilities:

Vision

To be recognized as a world leader in marine oil spill prevention and response.

Mission

To **PREVENT** oil spills by assisting tankers in sate navigation through Prince William Sound and to **PROTECT** the environment by providing effective **RESPONSE SERVICES** to the Valdez Marine Terminal and Alaska Crude Oil Shippers with oil spill response agreements and plans.

More than 250 people are directly assigned to the organization operating in or out of Valdez. Personnel include staff, managers, response specialists, chartered or contracted vessel crews, response crews, material handlers and mechanics. The organizational structure of SERVS is designed to support day-to-day operations and transition into the incident command system efficiently for effective response to a major spill in Prince William Sound.

Role of Alyeska

Alyeska's services include communication with the tanker when inbound or outbound between the Valdez terminal and the area of Seal Rocks to prevent or minimize a discharge or threatened discharge of oil. On behalf of the planholder Alyeska complies with Alaska regulation 18 AAC 75.475 for maintaining the response equipment listed in its oil spill primary response action contractor application in response-ready conditions and providing the equipment out-of-service notifications to ADEC. When Alyeska discovers, or is advised, that an oil spill has occurred it provides initial oil spill response services and promptly notifies the planholder of the oil spill.

Transfer of the response occurs when the responsible party assumes from Alyeska the management and control of efforts to contain and clean up an oil spill. However, Alyeska/SERVS response equipment and response

personnel are made available for continued use under the management of the responsible party in its oil spill response. Transfer of the response obligations required in Alaska Statute, AS 46.04.020(g) occurs at the time agreed to by the federal on-scene coordinator and the state on-scene coordinator.

Prevention

The real key in the business of oil spills is **prevention**. Prevention of a tanker incident in Prince William Sound (PWS) has been greatly enhanced during the past seven years. Prevention is practiced and emphasized in a number of ways in PWS for Trans-Alaska Pipeline System (TAPS) trade tankers, including, but not limited to:

- drug and alcohol screening and testing;
- 24 hour standby for all SERVS response equipment, including equipment at Cape Hinchinbrook and Naked Island;
- six hour average response time for SERVS equipment;
- response equipment stationed at five communities, five fish hatcheries and sensitive aquatic habitat (duck flats);
- tugs are tethered to tankers through the Valdez Narrows to Buoy #9;
- at least one escort response vessel and one tug escort with the capability to tow or push accompanying each laden tanker through PWS;
- major risk assessment of system conducted;
- USCG automatic dependent surveillance system for tanker position monitoring;
- traffic separation scheme;
- industry ice navigation procedures;
- multiple visual and electronic observations of conditions to observe additional traffic, ice and other phenomena;

- pre-booming of tankers prior to transfer operations, shutdown transfer operations due to splashover of boom
- PWS transit speed limit of 10 knots, with 5 knot limit in the Valdez Narrows and 8 knots in Valdez Arm;
- communications to question or alert tanker of atypical behavior;
- escort tug on standby at Hinchinbrook while tanker moves 17 miles outside PWS;
- independent vessel tracking by radar, electronic navigational aids, and visual observations to insure optimum tracking; and
- outbound laden tankers are not allowed to transit Hinchinbrook Entrance at winds above 45 knots or seas above 15 feet.

Escort Vessel Program

The function of the escort vessels is to be immediately available to assist tankers in case of emergency, to warn of any impending danger and to provide initial spill response. All laden tankers transiting Prince William Sound (including partially laden inbound tankers) are escorted by two escort vessels, at least one of which is an escort response vessel (ERV). Each ERV is designed and equipped for towing and is filled with fenders to come alongside a tanker. An ERV under contract with Alyeska will provide emergency services to a tanker as requested by the tanker master. ERVs carry boom, skimmers and other equipment for immediate response in the event of a spill.

Outbound and inbound laden tankers are escorted between the Valdez Marine Terminal and Seal Rocks via Hinchinbrook Entrance. Escort vessels remain within a quarter mile of the tanker being escorted throughout the passage unless the safety of any vessel is compromised. The escort vessels remain at close quarters when transiting the Valdez Narrows where a maximum speed of 5 knots is mandated by the U. S.Coast Guard.

Escort vessels are positioned to provide the maximum possible assistance if needed. This positioning varies according to weather, ice or operational conditions, depending on the judgment of the tanker master, pilot, or the escort vessel master. Four ERVs and four tugs currently handle the escort schedule in a normal rotation. A substitute vessel may be used, if needed, because of routine maintenance, downtime and other circumstances. The number of ERVs or tugs available will always be a function of tanker traffic. Tanker traffic is suspended by the Coast Guard when reported sustained winds in Port Valdez, Valdez Narrows or PWS reach or exceed 40 knots. Once an escort is underway it will normally proceed to completion. However, during periods of severe weather the masters of the escort vessels may require slower escort speeds or terminate the escort to seek shelter. If the escort is terminated, the USCG Vessel Traffic Center is notified.

Emergency Tow Program

Two emergency tow packages exist for tankers in Prince William Sound. Both are intended for emergencies only and not for long term towing operations.

- Each escort vessel is fitted with rapid deployment emergency towing gear that is made up and ready on the deck.
- Each tanker is fitted with Prince William Sound towing equipment. The operating guidelines for the use of this towing equipment are contained in the Prince William Sound Emergency Towing Plan.

The Gulf Ser4dce rescue vessel is stationed at Hinchinbrook for standby and rescue.

Response Organization

The quantity and quality of equipment and personnel that have been assembled and trained for this response are among the best in the world. Shortly after the T/V Exxon Valdez spill in Prince William Sound, the TAPS owners and shippers working with Alyeska Pipeline Service Company, formed SERVS. Over the last seven years, the organization has grown in response to the contingency planning needs and now has one of the largest complements of oil spill recovery equipment and supporting vessel/barge recovery and storage systems in the world (see Appendix A, Reportable Equipment by Responding Unit).

The following scenario excerpt exemplifies the extraordinary quantity of resources which, weather permitting, can be brought to bear within Prince William Sound in the first 12 hours of an incident.

Location: Hinchinbrook Entrance, Prince William Sound, Alaska
Time: Never

The tug Sea Voyager and the Escort Response Vessel Pioneer Service are escorting the tanker .25 miles astern of the vessel. At five minutes after midnight the tanker reports a major spill to the USCG and the escort vessels. The response specialist reports the situation to the SEP VS duty officer. Within minutes, the response is in motion. The ship's master completes the required regulatory and company notifications after reporting the incident.

The SERVS duty officer notifies the operations control center duty officer at the Valdez Marine Terminal and initiates SERVS initial response notification procedures. The SERVS manager directs the SERVS duty officer to have all available off duty-SERVS staff report immediately to the SERVS base and directs the SERVS operations manager to mobilize and dispatch all SERVS vessels to the incident.

Concurrently with the following equipment actions the unified command will be assembling including the incident commander for the responding party (initially Alyeska); the federal on-scene-coordinator (FOSC), USCG Commander of the Port Valdez; and the state on-scene-coordinator(SOSC) and the ADEC representative in Valdez.

The oil spill response equipment and personnel includes:

- Task Force: TransRec barge Z-Big-1 with ERV Gulf Service from Port Etches [ETA 2:30 a.m.].
- Task Force: TransRec barge Tidemar 460 with Gulf Brent tug from Naked Island [ETA 4:30 a.m.].
- ERVs Liberty Service, Heritage Service, and Freedom Service from Valdez [ETA 5:30 a.m.].
- Task Force. TransRec barge Crowley 450-8 with tug from Valdez [ETA 7:30 a.m.].
- Task Force: TransRec barge Crowley 450-3 with tug from Valdez [ETA 7:30 a.m.].
- Task Force. Skimming vessel Valdez Star with barge Allison Creek from Valdez [ETA 07:30 a.m.].
- Task Force: Equipment/lightering barge JI-344 with tug from Valdez [ETA 7:30].
- Nearshore barge Responder 500-2 with tug from Valdez [ETA 8:30 a.m.].
- Fishing Vessel call-out initiated (50 core-fleet vessels called with additional vessels available)

In addition to this equipment, the nearshore and shoreilne equipment complements and crews are also being mobiized, along with the supporting incident command system (ICS) staffing, environmental resources, citizen-advisory' group members and the regulatory' agencies.

(Scenario excerpted from Prince William Sound Tanker Oil Discharge

Prevention and Contingency Plan, 1994 Supplemental information Document No. 22.)

Gulf of Alaska Response Capability

Under OPA 90 the tanker owners and operators for the TAPS trade are responsible for satisfying applicable federal response planning requirements for the Gulf of Alaska. The response requirements include a capability to conduct oil spill recovery up to 200 miles from shore under federally stipulated weather conditions. To meet this requirement SERVS became certified by the USCG as an offshore spill removal organization (OSRO). The tanker owners and operators have contracted with APSC/SERVS to use specified equipment should a Gulf of Alaska response be initiated. The SERVS response and equipment included several equipment and procedural modifications to ensure personnel safety for response in the Gulf of Alaska. Three recovery barges with TransRec skimmer systems have been modified to include on barge accommodations for up to 12 people. Modifications include all sleeping quarters; food preparation galley; sanitation, water and electric facilities; oil spill recovery equipment; wave protection breakwaters; and elevated catwalk. Additional lighting equipment was also installed. Each of the barges would be pulled by an ocean tug and accompanied by a 210 foot escort response vessel (ERV). Crewing includes up to 12 on the barge, 8 on the tug and 10 on the ERV. Up to 11 additional staff could be added aboard the ERV. A fast rescue boat has been installed aboard each of the ERVs and additional safety and offshore survival equipment and training has been included.

Spill Response Drills/Simulations

An announced or unannounced exercise is conducted at least once a year. These exercises are designed to test or observe the adequacy, in content and execution, of the Prince William Sound Tanker Oil Discharge Prevention and Contingency Plan and all its components. As part of Alyeska's ICS spill training and curriculum, numerous equipment exercises are also conducted each year. At least once every three years an exercise will be a full-scale drill (involving Prince William Sound tanker owners/operators/charterers, government agencies, Regional Citizens Advisory Council (RCAC) members, and deployment of SERVS equipment and fishing vessels). The intent of these simulations will provide various stress levels and test Alyeska's crisis management team in "real time" and "compressed time" crisis operations.

Training Program

The SERVS training program is coordinated within Alyeska and a special joint program with the Prince William Sound Community College. The training program includes mandatory safety, hazwoper and supervisory training, as well as basic and advanced oil spill response techniques, contingency planning, wildlife capture and rehabilitation, fishing vessel and incident command system (ICS) training. Several hundred hours of training are offered. Agencies and members of the PWS Regional Citizens Advisory Council and its committees are invited to participate in the specialized training programs as well. In addition, all contractors are responsible for providing appropriate required training for its employees.

ICS training is provided to all members of Alyeska's crisis management teams. ICS was designed as an all-risk emergency management system; original course instruction manuals and student workbooks were developed for wild land fire fighting. To incorporate oil spill terminology and operational procedures, courses have-been reworked so that trainees can understand specific duties of their oil spill response jobs. ICS training is

sequential and cumulative. Courses vary in length from one to three days. Section specific and advanced courses are provided for the command section and section leaders.

Response Strategies Including Open-Water, Nearshore and Onshore

The open-water strategy relies on on-scene response and deployment of available resources in a rapid and practiced response role. The elements of this strategy include available equipment and regular practice. However, as in all oil spills the actual open-water response will and must be uniquely tailored to the event, environmental conditions and circumstances under which it occurs. The ERV will be immediately available on-scene and in position to commence a response. At least one of the escort vessels is an ERV, and carries aboard it approximately 4,600 feet of boom, two skimmers and a workboat. In addition, as outlined in the scenario, skimmers, booms, vessels and storage capacity is available, and manned in PWS to be dispatched in response to a 300,000 barrel incident. Lightering equipment and storage capacity is also available. If applicable, dispersant and burning equipment is available and ready for response. The primary objectives of the first phase of the open water response are 1) to control the spill at its source in order to concentrate the oil and maximize recovery by mechanical means or burning; and, 2) to minimize contamination of the shoreline. Cascading boom configurations may be utilized to enhance the approximately 800 foot containment boom opening for a TransRec barge recovery system that employs two TransRec 350 skimmers and one GrahamRec skimmer system for a combined adjusted nameplate recovery capacity of more than 7,000 barrels per hour. Four TransRec barge recovery systems are available for deployment.

The nearshore response strategies include free oil recovery, protection strategies such as exclusion and diversion booming, oil entrapment techniques, passive collection, sensitive habitat protection, wildlife support

activities and on-shore cold water deluge protection strategies. The nearshore program involves a large number of fishing vessels; a group of smaller skimmers, specially designed and constructed mini barges and a larger support and oil storage barge. The nearshore response strategy focuses on the collection of oil that has escaped the primary oil spill recovery equipment and may be threatening nearshore or onshore resources. Communities that may be affected by an oil spill in PWS have been organized to assist as part of the plan. Community resources consist largely of fishing vessels under contract to Alyeska as the response action contractor (RAC), and equipment staged at five fish hatcheries, and in five communities in PWS.

Onshore response involves planning and conducting cleanup operations after the oil has reached the shore. The planning includes a shoreline cleanup assessment technology (SCAT) process, with agency, landowner, and responsible party assessments. Equipment for an initial response, (utilizing primarily cold water deluge, low and high pressure cold water-wash systems) has been purchased and is part of the existing response capability. Training in shoreline response methods as well as the prerequisite SCAT processes is included in the training and exercise program.

Fishing Vessel Program

As the RAC, Alyeska maintains more than 300 contracts with fishing vessel owners throughout PWS to support oil spill response. Fishing Vessel Administrators (FVA) are located in Valdez, Cordova, Whittier, Tatitlek, Chenega Bay, Seldovia, Seward and Kodiak. In the event of a spill the FVAs provide logistical support as requested by SERVS in the dispatching of fishing and other local vessels from their areas as well as boom and supplies. The fishing vessel support is an integral element for open-water, nearshore, wildlife protection, and burning response

strategies. Fishing vessel specifications are maintained in a computerized database to determine response support roles.

Sensitive Areas and Hatchery Protection Program

The protection of sensitive areas and fish hatcheries exposed to the possible threat of a spill in PWS is a priority in the nearshore response strategies. Hatchery protection equipment has been identified, dedicated and staged at five operating hatcheries in PWS:

- Armin F. Koernig Hatchery, Sawmill Bay, Evans Island;
- Cannery Creek Hatchery, Unakwik Inlet;
- Wally Noerenberg Hatchery, (Lake Bay) Esther Island;
- Main Bay Hatchery, Main Bay; and
- Solomon Gulch Hatchery, Port of Valdez.

Additionally, the Valdez Duck Flats aquatic habitat has equipment pre-staged. The equipment is containerized and sized for rapid deployment. Each set of equipment is specific for the individual site character, and the deployment plans have been prepared in detail. Year around maintenance and security is in place. On-site training is conducted with the response personnel from SERVS and nearby fishing vessel crews on a regularly scheduled basis.

Response Centers

Oil spill response equipment has been located in the communities of Valdez, Chenega Bay, Cordova, Tatitlek and Whittier. The response center equipment is multifunctional and includes, booms, sorbents, anchors, personal protective equipment, miscellaneous support equipment used in a spill response (survival and first aid equipment, tools, mechanical, decontamination, and mooring equipment, plastic bags, shovels, rakes, and the like). The equipment is secured in storage vans, and periodically maintained, and inventoried. In case of a response the mobilization and

deployment of the equipment is a local activity utilizing the fishing vessel and area administrator programs. Response Center personnel participate in periodic drills and training activities.

Dispersant and In-situ Burning Strategies

The development of detailed strategies and equipment for dispersant and burning response techniques is an integral part of the response planning for Prince William Sound. Working groups under the regional response team have developed permitting and application guidelines, while Alyeska has developed information documentation in conjunction with agency and regional citizen council participation and support. Major efforts are undertaken to stay abreast of the latest technology advancements and research efforts. In addition, major efforts have been expended to equip SERVS for operational response and provide operating procedures for deployment of the specialized equipment.

Alyeska has committed considerable equipment and stockpiles to the dispersant program. The equipment includes dedicated C-130 aircraft (Lynden), 2 ADDS Pack systems in Anchorage, Alaska; three vessel systems, dispersant and two helicopter bucket systems based in Valdez. Alyeska has coordinated with the 17th USCG District in the development and testing of the USCG dispersant capability. Alyeska and the USCG have executed a memorandum of understanding regarding assistance in case of a major incident requiring dispersant use.

SERVS also participated in the Newfoundland (NOBE) in-situ burning experiments. Operational equipment and procedures for the active use of in-situ burning are in place in the nearshore response group and are practiced in advanced oil spill training exercises.

Technology exchanges with the local communities are conducted to assist in education and understanding of the environmental tradeoffs that are an important part in the decision making process for the use of response tools.

Wildlife Protection and Rehabilitation

A detailed and noteworthy wildlife protection and rehabilitation plan, equipment stockpiles and facilities have been prepared. More than four years of analysis, trustee agency coordination, and public reviews have contributed to the program. The wildlife protection and rehabilitation plan addresses primarily birds and otters, and provides for wildlife capture and stabilization facilities within the first day of an incident, if necessary, followed by the setup of the treatment facilities already identified. In late 1995, the construction of a contingency otter treatment center was completed. The 16 conex unit was constructed to fit inside a building at the terminal and use oil terminal utilities, power, water, oil waste water treatment etc. State guidelines call for response treatment to be available within 72 hours. The response size is based on the response planning standards, and based upon all of the program elements is sized at a capacity to treat 500 birds and up to 20 otters a day, with a facility maximum of 200 otters. The plan elements also include an agency-guided euthanasia protocol for animals that cannot be successfully treated.

Coastal Resources and Sensitive Environment Inventories

The contingency plan includes detailed written, graphic and computerized data on the types and locations of sensitive coastal resources. Response priorities are being developed by the area committee that was formed by the USCG in response to OPA 90 requirements. However, the industry and agencies formed a joint Coastal Resources Working Group, co-chaired by the

Alaska Representative of the Department of Interior, and the Alyeska representative, to review, update and concur on one joint data base for coastal resource and sensitive information for the Prince William Sound area. The work group will also be addressing the Copper River Flats, outer Kenai Peninsula, and Kodiak Archipelago areas during the next two years.

Conclusion

Prince William Sound includes 11,000 square miles of shoreline, islands and open water, an area larger than the state of Vermont. The sound supports a wide variety of marine life and is the site of the largest oil terminal in the western hemisphere. Every laden oil tanker is escorted by an ocean going tug and a 210 foot escort response vessel from the terminal to Hinchinbrook Entrance. The ERVs are equipped to tow or assist tankers with power or maneuvering problems. They also carry oil spill response equipment for immediate deployment. Skimming and storage barges are located throughout the sound to provide immediate and timely ocean class spill response. The fishing fleet provides ready and available local assistance and trained expertise. Drills and frequent exercises train responders in advanced spill response techniques. Citizen involvement reviews the organization strengths and identifies areas for improvements.

Alaska/SERVS has assembled a major oil spill response operation in Prince William Sound. Prevention is the primary duty carried out daily with the average twice daily escorts of the Alaskan North Slope crude laden tankers. SERVS stands ready to respond with significant response equipment and trained crews deployed throughout Prince William Sound.

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APPENDIX A

Reportable Equipment by Responding Unit

Escort Response Vessels: Liberty Service, Freedom Service, Heritage Service, and Pioneer Service

- 3,000 ft quick deployment boom
- 1,600 ft Vikoma ocean boom
- (2) Sea Skimmer 50s
- (1) boom towing work boat
- (1) fast rescue craft
- towing winch
- emergency towing package

Escort Tugs: Gulf Brent, Dr. Jack, Sea Voyager, and Sea Swift

- tug fendering system
- towing winch
- emergency towing package

TransRec barges: Z-Big- 1, Tidemar 460, Crowley 450-8, and Crowley 450-3

- (2) TransRec skimmer systems
- 1,320 ft Ro-Boom 2,000
- (1) GrahamRec skimmer system

Lightering Barge JI-344

- (4) TK 150 portable lightering pumps and associated equipment
- (4) lightering ship to ship fenders
- 35 ton crane (in place by Dec. 31, 1994)

Nearshore barge Responder 500-2

(2) barge-mounted 35 ton cranes fixed hydraulic system

(7) DESMI skimmer systems

(4) Rope Mop skimmer systems

(4) mini barges

(4) inflatable barges

Gulf Service 220 ft; 11,200 horse power rescue tug deployed at Hinchinbrook Entrance