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Alyeska Pipeline Service Company/Ship Escort Response
Vessel System
“Safe Transportation of TAPS Crude”

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1.0 Background

Oil was first discovered at Prudhoe Bay, Alaska in 1968. Alyeska Pipeline Service Company (Alyeska) was formed to design, construct, operate and maintain the Trans Alaska Pipeline System (TAPS). The major owners of Alyeska are BP Amoco; ARCO; and Exxon. The four others owners are Mobil, Amerada Hess, Phillips and Unocal.

Following the Trans Alaska Pipeline Authorization Act (TAPAA) in 1973, construction of the Trans Alaska Pipeline was initiated. Construction of the pipeline and marine terminal – one of the engineering wonders of the world crossing 3 spectacular mountain ranges -- required 515 federal permits and 832 state permits. In 1997, the oil started flowing.

The Trans Alaska Pipeline System (TAPS) moves approximately 20 % of the United States' domestic oil supply safely and efficiently from it's fragile arctic beginnings through the 800 mile long pipeline to the marine terminal at Valdez. There it is loaded onto tankers that are escorted through Prince William Sound to the Gulf of Alaska - a 70 mile transit.

During its first 22 years of operation, Alyeska safely transported nearly 13 billion barrels of oil and loaded over 16,000 tankers while maintaining a high rate of reliability, environmental integrity and an excellent safety record.

Alyeska operates three primary business assets – the 800 mile pipeline, the Valdez Marine Terminal (VMT) and the Ship Escort Response Vessel System (SERVS), formed after the 1989 oil spill. This paper focuses on the mission, operations and marine environmental protection practices and technologies of Alyeska's Ship Escort Response Vessel System.

2.0 Alyeska's Ship Escort Response Vessel System

The Alyeska/SERVS mission is:

“To PREVENT oil spills by assisting tankers in safe 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 in accordance with oil spill response agreements and plans.”

The SERVS organization maintains a federal Oil Spill Removal Organization (OSRO) Certification (#0077) and a State of Alaska Primary Response Action Contractor (RAC) Registration. Based on a worldwide benchmarking analysis in 1999, the SERVS organization is the largest prevention and response organization in the world.

3.0 Prevention is the Key

The easiest oil spill to clean up is the one that never happens. To that end, Alyeska/SERVS places its primary emphasis on prevention beginning with a comprehensive tanker escort service for all loaded tankers.

Tanker Escorts: All tanker ships loaded at the Valdez Marine Terminal are escorted through Prince William Sound and out Hinchinbrook Entrance - 24 hours per day, 365 days per year – a total transit of approximately 70 miles. Each escort is logged and reviewed. Escorts maintain continuous communications and the system reliability is closely overseen by the US Coast Guard Valdez Marine Safety Office as well as State regulators and members of the PWS Regional Citizens Advisory Council (RCAC). In 1999, 451 tanker escorts were safely completed. A total of 7,765 tanker escorts have been completed since the inception of the program in 1989.

The evolution of the tanker escort system began with the emergency order issued by the state of Alaska in 1989. A fleet of 12 vessels, each singular in purpose, was quickly developed consisting of; three dedicated pairs of escorts (comprised of an Escort Response Vessel (ERV) and tug), Port Etches standby vessel, Naked Island standby vessel and four dedicated docking tugs. The emphasis was more towards oil spill response than prevention and there was little interchangeability between vessels, due in part to three separate marine companies providing vessels. During this period a typical escort might include three tugs undocking a tanker while the two escorts were standing by waiting. During this period, throughput was approximately 2.0 million barrels per day (mbbls/day) and loading occurred over all four berths.

In subsequent years a variety of factors caused various changes to the escort system and vessel mix. These included; the Disabled Tanker Towing Study, Prince William Sound Risk Assessment, promulgation of Federal Escort Requirements, oil spill response responsibility in the Gulf of Alaska, Tanker Vapor recovery and weather restrictions. Additionally, industry instituted voluntary measures such as ice scouts and sentinel standby for inbound tankers in ballast that has impacted the system as well as experience gained in the operation of the escort system. Fleet enhancements including the two enhanced tractor tugs, Nanuq and Tan'erliq and the rescue tug Gulf Service are examples of changes to the system based on the various studies and regulations.

As the escort system matured, there was a marked emphasis and focus on oil spill prevention, fleet modernization and multipurpose vessels to increase capabilities and maximize efficiencies.

In 1998, SERVS embarked upon a dedicated strategy to upgrade the specialized vessel fleet of 12 vessels to a fleet composed of fewer multipurpose vessels. This strategy included a marine alliance with Crowley Marine Services, and the construction of three multipurpose Prevention/Response Tugs. This strategy was expected to be a significant technological and operational enhancement of the fleet, with the ability of SERVS to reduce the total fleet size to initially ten vessels when the PRTs arrive, with the potential for further reductions dependent upon operational requirements. Stakeholders formally endorsed the strategy in late 1998.

The SERVS Year 2000 Strategy preserved the original theme of a multipurpose core fleet with a slight variation. The original strategy included a special service vessel at Cape Hinchinbrook to perform open ocean rescue duties. The SERVS 2000 strategy involves utilizing a PRT as the Hinchinbrook tug, the enhanced tractor tugs as the close escorts for the entire transit of a general purpose “utility vessel”. This still allowed for an overall reduction in the number of vessels, operational efficiencies and reduced costs. The status of the new PRT’s meeting the state best available technology (BAT) requirements is currently being addressed.

The year 2000 vessel strategy is outlined below:

Vessel Type	Mission	Duties
Hinchinbrook Tug PRT <i>Alert</i>	Escorting/Response	Close Escort at Cape Hinchinbrook.
Enhanced Tractor Tug – <i>Nanuq</i>	Multipurpose*	Tethered Escort to Buoy 9, close escort entire transit
Enhanced Tractor Tug - <i>Tan'erliq</i>	Multipurpose*	Tethered Escort to Buoy 9, close escort entire transit
PRT <i>Attentive</i>	Multipurpose*	Close Escort/Sentinel
PRT <i>Aware</i>	Multipurpose*	Close Escort/ Sentinel
Tractor Tug Guard	Docking/Escorting	Docking/back up tether
Utility Vessel	Inbound Sentinel/Response	Barge Tending Naked Island/Inbound sentinel
Conventional Tug	Docking/Escorting	Docking
Conventional Tug	Docking/Escorting	Docking

* Multipurpose is defined as docking, escorting and oil spill response

PWS Risk Assessment and Increased Prevention for Tanker Traffic:

Alyeska undertook a major new risk assessment in cooperation with the State of Alaska, US Coast Guard, TAPS Marine Shippers and the Prince William Sound Regional Citizens Advisory Council (RCAC). This resulted in enhancing several prevention measures including the addition of a high horsepower vessel staged at

Hinchinbrook Entrance, and most recently the completion of two state-of-the-art Enhanced Tractor Tugs.

Enhanced Tractor Tugs: Two new-generation, state-of-the-art, 10,000-horsepower Enhanced Tractor Tugs (ETTs) equipped with Voith Schneider propulsion were deployed during 1999. It is because of their exceptional maneuverability, that the *Nanuq* and *Tan'erliq*, Alaska Native words for polar and black bear, are the two vessels currently used in the tethered escort mode during escort operations. The vessels enhance the ability to assist a disabled tanker. Trained response personnel and crews are aboard the vessels along with spill response equipment.

Prevention/Response Tugs: Three new Prevention and Response Tugs (PRTs) with z drives specially designed for escorting and response service in PWS were commissioned for year 2000 deliveries. These new PRTs are being built in Dakota Creek Shipyard, Anacortes, Washington and represent new technology for prevention and response missions by powerful ocean-class tugs. Delivery of the first of these three vessels, the *Alert*, has just occurred (mid-February) as this paper is being finalized.

4.0 Ready to Respond

Prince William Sound (PWS) Response System: Alyeska/SERVS manages the response system that is based on a State planning standard for response of 300,000 barrels of recovery within 72 hours, which is higher than the federally mandated OPA requirements. As a part of this program, Alyeska/SERVS maintains 4 major open-water skimming barges with a combined storage capacity of over 800,000 barrels, 14 major skimming systems (TransRec 350's, GrahamRec and the *Valdez Star*). Nearly 100 smaller skimmers are available for recovery operations in open water and near shore. Shoreline response equipment and contractors for 5 beach recovery units are maintained. Alyeska/SERVS contracts with more than 300 local fishing vessels to assist in response and to provide sensitive resource protection and local knowledge. In addition, spill response equipment is maintained in five communities around PWS. Protective booming strategies and equipment are in place at five hatcheries and geographic response strategies for other sensitive resource sites in the Port of Valdez and PWS. Training for response personnel and contractors is an ongoing activity, meeting the National Preparedness for Response Exercise Program (NPREP) guidelines.

High Volume Skimmers: Alyeska/SERVS uses this technology designed by an Alyeska Contractor for spill response readiness (2 each TransRec 350's and one GrahamRec skimmer per barge). Three large recovery skimmer units capable of recovering over 7,000 barrels per hour (nameplate) are mounted on an oil recovery barge with over 125,000 barrels of recovered oil storage capacity. This unit makes up a single open-water task force system. Four systems are in use. In addition, research and field-testing is underway for the "Current Buster". This containment system has a confined collection area that allows skimming to take place at increased speeds. Alyeska/SERVS has participated in testing at the

OHMSETT test tank (with oil) and in field trials (without oil) in Prince William Sound and in British Columbia.

Fishing Vessel Training and Response Program: A major environmental outreach program that is a vital portion of our spill response is the fishing vessel program. Alyeska/SERVS works closely with the communities of Prince William Sound in mobilizing the resources and preparing to respond to any spill. There are more than 300 fishing vessels currently on contract with Alyeska to provide oil spill response assistance. These vessels are integrated into response plans and trained in the use of equipment. The Core Fleet is made up of 50 of these contracted vessels. This group provides immediate and year-round response support. Fishing vessels receive specialized training and participate in spill response drills and exercises during the year. The fishing vessel program is administered through Fishing Vessel Administrators (FVAs). Fishing vessel support is an integral element for spill response strategies especially in nearshore, wildlife, and in-situ burning response strategies as well as support operations. The fishermen provide invaluable local knowledge that contributes largely to site specific improvements in response plans. Oil spill response equipment has been staged in the communities of Valdez, Chenega Bay, Cordova, Tatitlek and Whittier close to the local fishing vessel centers and sensitive resources.

The fishing vessel program is a major supporting element in the protection of sensitive areas and fish hatcheries. In addition to the hatcheries, the Valdez Duck Flats, a significant and designated migratory waterfowl habitat in Port Valdez has a protection plan. Training and drills with local members of the fishing vessel fleet include a lessons learned session to capture operational items for improvements.

Benefits of the environmental programs and education are seen in a number of ways within the communities and partnerships. Examples of this include cleaner harbors and fewer spills to water due to education and experience gained by fishermen participating in Alyeska/SERVS programs. The fishermen learn skills and tactics for responding safely to large incidents as well as operating in a very clean environment. The participants have applied these lessons in their everyday lives. For instance, in 1999 several community events promoting harbor pollution prevention were held with the support of the Alaska Department of Environmental Conservation and the US Coast Guard.

Incident Command System (ICS): Alyeska/SERVS has been a leader since 1989, in defining, promoting and using the ICS style management on spill and incident responses. In the last two years, Alyeska/SERVS has worked closely with the Alaska Department of Environmental Conservation, United States Coast Guard (USCG) and other responders to improve program definitions, training, forms and application of this system. We have found the system to be invaluable in the early stages of a crisis for organization, it then progresses into a well-developed, effective, right-sized project team to control the situation and effectively mitigate environmental damage.

Specialized Training Programs: Alyeska/SERVS has developed comprehensive training programs in spill response to maintain high levels of

readiness. Operational training is historically based and focuses on basic skills and improvements gathered through previous lessons learned during drills and exercises. The education techniques focus on adult learning methodologies, drawing on the team members as a valuable resource and presenting information relating to real life situations. A major success factor is the training being clearly linked to the contingency plans. This helps the participants learn the technical aspects of the plan, relates the operational tactics and strategies to the plan contents and develops the responders' confidence that they know their plan.

Classes range from basic to specialized courses. The three day *Alyeska Basic Oil Spill Response Training* course and the two day Incident Command System (ICS) training provide fundamentals. Various specialized programs include: trajectory modeling using Alyeska Tactical Oilspill Model (ATOM), wildlife hazing, capture and rehabilitation courses, technical progression programs for technicians, special contingency planning and prevention training, tanker towing exercises, operational exercises involving all of the tactics within the contingency plan, emergency response planning, Crisis Management Team and Incident Management Team (CMT, IMT) training and drills.

Alyeska Drill Program: Alyeska follows the National Preparedness for Response Exercise Program (NPREP) guidelines. The company program includes both Crisis Management and Incident Management Teams and exercises various crisis modes (natural disasters, human disasters and spill responses). About three dozen drills and exercises occur annually in PWS and one is done in conjunction with the crude oil shippers. Alyeska was a major participant in the 1998 BP SONS Drill, providing a significant contribution with the creation of "drill truth"-- preceding days history, timeline, equipment, operational details and environmental information.

Alyeska/SERVS has worked with its owner/shipper companies on the implementation of an automated spill response resource tracking/ordering system named RESPONSE_{tm} that supports the management of response resources. During the 1998 BP SONS Drill, it was generally agreed (as reported in the BP SONS Drill Evaluation Report, 1999) by "players and evaluators alike that this program was a valuable response tool. It is likely that a response of this magnitude could only be accomplished effectively utilizing a tool of this type." Alyeska is continuing to implement this system company-wide, expecting significant efficiencies in managing resource assignments and tracking, and information exchange regarding response resources.

Graphical Resource Database(GRD): The company maintains a computerized, graphic database with multiple layers documenting thousands of environmentally sensitive biological, cultural, social and human use sites. The database is maintained in close coordination with trustee agencies. The database included 2,200 records in 1992 and has grown significantly with over 10,000 in the 1998 update, more than 14,400 records in the interim 1999 update and the January 2000 issue nearly fills a compact disk. The database is provided on CD for use by responders, agency personnel and the public involved in the response. The recent update significantly expanded link file information including, for instance, photos of pre-spill shorelines surveys.

Alyeska's Tactical Oilspill Model (ATOM): The trajectory model developed by ASA (and similar to their World Oil Spill Model) is specific to Prince William Sound including both two and three dimensional modeling, resource locations, sensitive resource identification, oil mass balance and dispersant analysis capabilities.

Mobile Wildlife Stabilization and Cleaning Units: Alyeska/SERVS redesigned existing technology to provide mobile stabilization and treatment centers for wildlife that may be oiled should a major spill occur. These mobile units provide primary on-scene care for Prince William Sound, and can be moved to other areas using available transportation (Hercules type aircraft or highway trucks.)

5.0 Communicating with Stakeholders

Alyeska recognizes its responsibility to respond to the needs and concerns of stakeholders regarding the prevention of oil spills in the operations of the TAPS. Planning for and the successful implementation of Alyeska/SERVS prevention and response goals and strategies must include the thoughts, ideas, and concerns of a broad base of industry, government, and public interests. Stakeholders in TAPS operations include the owners of the Trans-Alaska pipeline, the producers of the oil, marine shippers, State of Alaska, U.S. Coast Guard, the Prince William Sound Regional Citizen's Advisory Council, local community representatives, and public interest groups.

Alyeska actively maintains communications with congress and state legislators; national and state regulators including the US Coast Guard at the Valdez Marine Safety Office (MSO), as well as District 17 and Headquarters, the State of Alaska Department of Environmental Conservation (ADEC) and the Joint Pipeline Office. In addition, communications and technical exchanges occur with numerous state and federal trustee representatives throughout the vast areas of our operations as well as local government involvement. Stakeholder interactions occur continuously with the Prince William Sound Regional Citizen Advisory Council, funded by Alyeska as the OPA 90 citizens oversight group for PWS operations. Discussions and communications with local and regional citizens, community representatives and native groups is crucial to communicating with all interested parties about operations that are occurring in their home regions.

6.0 Partnerships/Benefits

USCG : The constant and significant presence of Alyeska's Ship Escort Response Vessel System throughout PWS has proven to be a significant asset to the community and has provided the US Coast Guard MSO Valdez with measurable assistance in many areas. These range from everyday reductions in marine pollution and safety incidents to the substantial savings to life and property through search and rescue support efforts. Several examples of these partnership attributes are discussed below:

Fishing Vessel Safety Program Partnership: Alyeska/SERVS Fishing Vessel Program is closely aligned with the US Coast Guard commercial fishing vessel safety program. The Alyeska contract for fishing vessels includes a requirement

that the fishing vessel completes and displays the USCG fishing vessel safety examination decal. Since that requirement was implemented USCG officials have documented a reduction in the number of fishing vessel crew deaths. USCG officials attributed part of this downturn to the required safety training and equipment that fishing vessel crews acquired to receive or maintain their Alyeska contract. This voluntary USCG program has received much attention, and a portion of this success has been attributed to the partnership with the fishing vessel program supported by Alyeska/SERVS.

Examples of Marine Safety “Saves”: Since 1994, more than 45 situations have occurred where Alyeska/SERVS provided some level of search and rescue assistance. Examples follow: In the early evening hours of September 15, 1999, the local USCG office requested SERVS help with the F/V *Odyssey*, a 40’ seiner with three people onboard, adrift off Hook Point on Hinchinbrook Island in the Gulf of Alaska with current conditions of “storm warnings.” The fishing vessel had dead batteries, fuel problems and was requesting assistance and a tow. The *Sea Venture* (an ocean going tug on spill prevention and response duty in Port Etches) was dispatched and in less than three hours had arrived on scene and taken the stricken vessel in tow, returning to Port Etches. The crew from a second spill prevention and response vessel (the *Liberty Service*) on duty with the response barge in Port Etches were able to assist the crew to correct the problems, averting any loss of life or property.

Two days prior to the above incident, the NOAA weather buoy, (which records wind and sea state information at Seal Rocks outside Hinchinbrook Entrance) was retrieved by the *Gulf Service* vessel just before beaching on outer Montague Island. The buoy had broken free of its mooring and was adrift with the potential of being lost or severally damaged. Our operation was able to provide assistance to the USCG in finding and salvaging the state-of-the-art buoy.

Other examples in 1999 include saving the lives of two people in a capsized skiff in Port Valdez; and, retrieving several stranded persons (some with hypothermia) from a remote, unpopulated beach whom had been on a recreational outing when their small vessel was damaged.

Prince William Sound Regional Citizens Advisory Council (RCAC): RCAC is certified under the Federal Oil Pollution Act of 1990 as the alternative citizens advisory group for Prince William Sound, and operates under a contract with Alyeska. The contract, which is in affect as long as oil flows through the pipeline, guarantees RCAC's independence, provides annual funding (by Alyeska) of \$2.5 million, and ensures RCAC access to the VMT and SERVS facilities. PWS RCAC is a non-profit corporation guided by its mission: “*Citizens promoting environmentally safe operation of the Alyeska Pipeline Service Company Terminal in Valdez and the oil tankers that use it.*” The council’s 18 member organizations include communities in the region affected by the 1989 spill in Prince William Sound, as well as aqua-culture, commercial fishing, environmental, Native, recreation, and tourism groups. The Council reviews, monitors and advises Alyeska and the public on marine terminal and tanker oil spill prevention and response, environmental protection, community response planning and public education and outreach. RCAC has been an active voice for

citizen concerns. Alyeska maintains an RCAC Liaison to facilitate communications with the Council and the staff of the organization. In addition, many Alyeska personnel participate in the four committees of the organization: Port Operations and Vessel Traffic Systems; Oil Spill Prevention and Response; Scientific Advisory; and Terminal Operations and Environmental Monitoring.

Prince William Sound Community College (PWSCC): The Prince William Sound Community College, University of Alaska, partnership is an innovative partnership that focuses on training and education. The relationship provides administrative, faculty and facility support for major portions of the company's extensive training program. For example, the college partners with the Alyeska/SERVS organization to provide HAZWOPER, regulatory, wildlife capture and rehabilitation and other programs to support the spill prevention and response training needs, especially in communities around Prince William Sound. The partnership allowed the college to further develop during the mid-1990's, the Associate of Applied Science Degree in Oil Spill Response Technology, one of the first in the world. That partnership has continued with the community education sessions and instructor exchanges that address limited spill response teaching resources in the Prince William Sound area. The partnership has also offered excellent opportunities to work with other sponsors to bring significant technical and policy symposiums to the community. Examples of symposiums include: "*Partners in Prevention*", March, 1999 and "*Prevention is the Key*", October, 1996.

7.0 Conclusion

Oil spill prevention and response is both a technical issue and one of communications. On the technical side, Alyeska has worked diligently to provide a major spill prevention program for the transportation of Alaska North Slope Crude through the Trans Alaska Pipeline System – From Pump Station 1 to Hinchinbrook Entrance. Alyeska has worked to implement significant reductions to the potential risks by designing and commissioning new marine equipment for the escorting service and providing well-coordinated procedures to implement the escort system. In addition, the response side continues to be enhanced with improved equipment and technologies and training continues to be a focus.

Keeping stakeholders informed about our company's activities, plans and situations is also critical to our success. Just as critical is listening. Listening with an open mind to the questions, concerns and issues fosters a clear opportunity to exchange information. Working openly with all stakeholders including our regulators and the public does not mean that we always agree. It does, however, allow for each party to understand the situation and to ask questions. Issues can be identified, and if necessary, agreement is made to have different views on a given subject. By sharing as much information as possible, as openly as possible, we are able to keep everyone informed and better able to share our views.

8.0 References

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