Coming Down the Pipe

News from the Joint Pipeline Office

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Installation of the pig launcher at Pump Station 8—image taken by JPO/BLM General Engineer John Governale

Alyeska completes second planned summer shutdown of TAPS

At PS08, Alyeska completed the critical parts of the installation of an "inline" pig launcher in the manifold building. Pump Station 8 (PS08) is located approximately 40 miles south of Fairbanks. The pig launcher installed at the station will be used to launch pigs equipped with In-Line Inspection (ILI) devices. By placing this launcher at PS08, Alyeska shortened the maximum run length for the southern section of the TAPS by one-third. After modifications associated with shutting down facilities, Alyeska had to launch ILI devices from PS04 and they had to travel the entire distance to Valdez. The PS08 inline launcher will shorten an approximate 600-mile ILI run to two shorter sections: approximately 200 miles and 400 miles. By shortening the run time for this ILI pig Alyeska hopes to see improved ILI results due to less wax accumulation.

JPO personnel were on hand to monitor load testing of critical battery banks for the Uninterruptible Power Supplies (UPS) in the Control Module and Power Distribution Modules at PS03. PS03 is one of three pump station that has undergone strategic reconfiguration.

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Alyeska's ballast water treatment facility modifications reduce hazardous air pollutants at the Valdez Marine Terminal

Introduction

By the end of 2010 Alyeska Pipeline Service Company is expected to complete comprehensive modifications to its ballast water treatment facility located at the Valdez Marine Terminal that will substantially improve the facility's ability to reduce emissions of hazardous air pollutants (HAPs).

Two major sources of HAPs since the terminal was constructed in 1977 were the tanker berths and the ballast water treatment facility (BWTF). In the late 1990s a vapor control system put in place by Alyeska significantly reduced hazardous emissions at berths four and five. Phasing out single-hull tankers from service to the terminal accounted for a major reduction of oily ballast water at the BWTF and, as a result, a substantial decline in HAPs. In 2000 Alyeska processed 83.7 million bbls of oily ballast. That amount was reduced to 14.3 million in 2008. Estimates for the total amount of BTEX gases (a subset of HAPs emission that is of special concern is BTEX) produced at the BWTF varies, but Alyeska notes that reduction in BTEX gases will drop to 10 tons in 2009 as a result of phasing out single-hull tankers in combination with vapor controls and declining ballast throughput.

(BWT/BTEX con't on pg. 2)

In this issue …

The Joint Pipeline Office (JPO) is an umbrella organization of state and federal agencies responsible for regulation and oversight of the Trans-Alaska Pipeline System (TAPS), and other non-infield oil and gas pipelines in Alaska.

BWT/BTEX (con't. from pg. 1)

Changes at the treatment facility, in addition to efforts to put vapor control at the tanker berths, constitute a significant effort and investment by Alyeska to reduce harmful emissions at the terminal.

Two significant catalysts driving these changes are (1) the Oil Pollution Act of 1990 (OPA90) and (2) the reduction in Trans-Alaska Pipeline System (TAPS) throughput. Part one of this two-part article will address the act and, in particular, its phase-out requirements for single-hull tankers. The transition from single-hull to double-hull tankers significantly impacted the type and quantity of influent processed at the facility. Part one of this article will conclude with a discussion of ballast water from tankers and how wastewater (including ballast water) was processed at the treatment facility prior to the soon-to-be-completed renovations.

Part two of this article, which will appear in the next newsletter, will discuss the regulatory framework governing air quality and hazardous air pollutant emissions and its impact at the Valdez Marine Terminal and the processing plant. The article will briefly discuss the addition of a vapor control system at tanker berths four and five before concluding with a discussion of some of the significant modifications made by Alyeska to adapt to current conditions at the terminal and how these changes address hazardous emissions.

The Oil Pollution Act of 1990 (OPA90)

In the wake of the 1989 Exxon Valdez Oil Spill, Congress passed the Oil Pollution Act of 1990 (33 U.S.C. secs. 2701 *et seq*. (1990) (OPA90). The legislation applies to all U.S. waters. OPA90 set new requirements for vessel construction and crew licensing. It improved the enforcement and response capability of agencies, including the EPA and U.S. Coast Guard. It established mandates for contingency planning. Liability in the event of an oil spill is a significant focus of the act and extends to removal costs and damages to natural resources, real or personal property, subsistence use, revenues, profits and earning capacity, and public services.

Under OPA90 a comprehensive schedule was passed requiring new oil tankers to be double-hull and establishing a phase-out schedule for existing single-hull tankers. Phase-out dates depended on the vessel's date of build, gross tonnage and whether it had been fitted with double sides or double bottoms. The final date for phase-out of all single-hull tankers is 2015.

OPA90's effects have been felt world wide. Spillage volume of crude oil and refined hydrocarbon products has been greatly reduced since it was enacted. Its effects have extended beyond U.S. waters. The International

Image of DAF cell at BWT—photo taken by Mark Morones, SPCO/JPO

Maritime Organization patterned new international standards after OPA90 that will eliminate virtually every single-hull tankers in the near future from international trade and increase the liabilities of tanker operators.

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M/V Polar Discovery loading up at Berth 5 of the Valdez Marine Terminal—file photo by Mark Morones, JPO/SPCO

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Tankers & Ballast Water

For many years the terminal was primarily served by single-hull tankers. OPA90's requirement to phase out single-hull tankers for double-hull tankers conferred a significant environmental benefit to the terminal and surrounding Alaska waters. Double hulls provide an additional layer of protection in the event the outer hull is ruptured. Having a double-hull vessel also provides greater facility for segregating ballast water from crude oil.

When a tanker is loaded with oil, the vessel sits lower in the water and has greater stability. After a tanker off-loads its crude, it takes on ballast water to provide stability to the tanker enroute to take on a new shipment of crude oil. In single-hull tankers, ballast water is often pumped into the vessel's storage tanks and can mix with the residual crude. When a tanker arrives at the terminal, non-segregated ballast water is pumped out of the vessel's hold and pumped to the ballast water treatment tank to remove the oil from the water. In double-hull tankers, the ballast water is segregated from the compartments that carry oil. On occasion, when heavy sea conditions are expected, double-hull tankers might take on additional ballast in the cargo tanks for increased stability.

Over the last 10 years there has been a noticeable reduction in oily ballast water requiring treatment at the terminal as single-hull tankers serving Valdez have nearly been phased out. In 2000 eighty percent of the tanker visits (379 of 453) to the terminal were made by single hull tankers. That year the treatment facility processed 83.7 million bbls of oily ballast water. Through the end of 2008 ninety-four percent of the tanker visits (268 of 284) to the terminal were made by double-hull tankers. The amount of oily ballast water processed at the treatment facility in 2008 declined from 83.7 million to 14.3 million bbls.

This reduction in ballast water is significant because this is the primary wastewater product the ballast water treatment facility was designed to process. Oily ballast water, in turn, is the source of BTEX gases – an especially toxic component of the hazardous air pollutants (HAPs) emitted at the Valdez terminal. (BTEX stands for benzene, toluene, ethyl benzene, and xylene).

(con't.)

Modifications to DAF cell area—photo by Mark Morones JPO/SPCO

Ballast Water Treatment Facility, part 1

The ballast water treatment facility separates oil from dirty ballast water and treats wastewater at the Valdez terminal. On average the facility treats 120,000 bbls of ballast water per day. It has a system capacity of 21,000 bbls/hour. On average, the facility recovered 600 bbls of crude oil/day from the ballast water. Not all ballast water requires treatment at the facility. Alyeska tracks and treats oily ballast water. Clean (segregated) ballast water is discharged into the sea. Segregated ballast discharges are not measured by Alyeska.

Aside from ballast water, wastewater processed at the treatment facility includes snow melt, rain run-off and industrial wastewater. Alyeska estimates that it currently processes 700,000 – 1,000,000 gallons of storm water and industrial wastewater every day.

Crude and ballast water pipes at berth 5 of the Valdez Marine Terminal—photo by Mark Morones JPO/SPCO

When a tanker arrives at the terminal the oily ballast water is pumped to the one of three ballast water storage tanks (called 90s tanks) for

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gravity separation. These tanks have a 430,000 bbl capacity. The separation process typically takes four hours. During this time oil separates from the water and floats to the surface. The surface oil is then skimmed and removed to the recovered crude oil (80s) tanks. There are two 80s tanks, each with a capacity of 36,000 bbls. Recovered crude from the 80s tanks re-enters the crude oil stream to join crude from the tank farm for loading in tankers.

After separation the wastewater remaining in the 90s tanks is piped to the dissolved air flotation (DAF) cells. Recycled water is supersaturated with air in pressure tanks and mixes with the wastewater stream as it enters into the DAF cells. In the DAF cells the dissolved air binds with finer particles of crude suspended in the wastewater. The crude floats to the top of the DAF cell where it is skimmed. This skimmed, recovered oil goes to the 80s tanks for reintroduction into the crude stream.

From the DAF cells, wastewater overflows into the flood weir where it is routed through a splitter into one of two biological treatment tanks (BTTs). (In the past wastewater overflowing the DAF cells into the flood weir created turbulence that resulted in the release of BTEX. This function was modified as part of the upgrades to the treatment facility). The biological treatment tanks (BTTs) have a capacity of 5.5 million gallons (approximately 131,000 bbls). In these tanks bacteria (naturally found in the oil) consume the remaining petroleum. Gas strippers at the end of the BTTS are equipped to remove soluble hydrocarbons, when necessary, during BTT upset conditions (low ballast situations that "starve" oil-consuming bacteria or situations where high quantities of hydrocarbons are too great to process). In accordance with its NPDES (National Pollutant Discharge Elimination System) permit, Alyeska tests the wastewater from the BTTs for BTEX. After treatment, the wastewater (now referred to as "effluent") is discharged into the waters of Port Valdez.

End of Part 1 – The second part will be published in the August 14 JPO Newsletter.

JPO/SPCO Compliance Team Welcomes Benjamin Hagedorn

The Lease Compliance Section of the State Pipeline Coordinator's office welcomes Benjamin Hagedorn as the section's new Natural Resource Specialist III. Benjamin formerly worked at the Alaska Department of Natural Resources in the Realty Section, where for the past four years he has worked on shore fisheries and adjudicating easements for the Iditarod Trail. Benjamin is a graduate of Western Washington University in Bellingham, Washington.

Photo of Benjamin Hagedorn—taken by Tamma Brown

JPO Management Team

STATE TEAM MEMBERS

Mike Thompson (DNR/SPCO)

State Pipeline Coordinator

DNR Liaison

Ron Doyel (ADEC)

DEC Liaison

Ray Elleven (ADOL/WD)

DOL Liaison

Dennis Gnath (ADF&G)

ADF&G Liaison

John Reeves (ADOT&PF)

ADOT&PF Liaison

John Cawthon (ADPS/SFMO)

ADPS/SFMO Liaison

FEDERAL TEAM MEMBERS

Jerry Brossia (DOI/BLM)

Authorized Officer

BLM Liaison

Jeffrey Walker (DOI/MMS)

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USACE Liaison

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