

# The NOHO HELE

*This bulletin was prepared to share lessons learned with industry and interested public, and to make recommendations to prevent similar occurrences. The company operating the NOHO HELE at the time of the incident was invited to provide comment on this bulletin. They did not provide comment.*

## OVERVIEW

On Monday January 17, 2005 at 2220 the tug boat NA HOKU approached the ConocoPhillips Refinery pier with the empty tank barge NOHO HELE under tow. The NA HOKU shortened up the tow and then made up to the NOHO HELE's port side and landed the barge starboard side to the pier at 2305. At 0045 on the 18<sup>th</sup>, the barge began loading 54,000 barrels of diesel. At approximately 0630 the cargo loading was stopped when diesel was discovered in the water. The diesel on the barge was pumped back to the facility and inspection of the hull revealed a hole through which the diesel had leaked. The leak was stopped at approximately 0830. An investigation revealed that the tug's fendering system had punched a hole in the barge when the tug came along side it on approach to the pier.

*Figure 1:  
NA HOKU and  
NOHO HELE tied  
up at  
ConocoPhillips  
pier. (Blue hulled  
ship on the other  
side of the pier is  
the Polar  
Endeavor)*



## VESSEL INFORMATION

### NOHO HELE

The NOHO HELE was a 24-year-old United States-flagged tank barge of 4,186 gross tons. The barge was single-hulled and rated for grade A and E cargos. NOHO HELE was used to transport fuels. The dimensions of the barge were 340' x 78' x 19' with a draft when light of 5 feet and 16 feet when loaded. The barge had 15 cargo tanks arranged in five sets of three across (port, center, starboard). The No. 1 tanks were designated as void spaces.

### NA HOKU

NA HOKU was a 24-year-old twin propeller United States-flagged tugboat of 375 gross tons. Its length was about 32 meters. The NA HOKU was serviced in the shipyard in 2004 where changes were made to the fendering system. The fendering system previously consisted of tires hung on chains over the vessel's side. The system was changed in 2004 to accommodate additional tires by bolting them onto the side of the vessel. This system was based on a design used by another U.S.-West Coast tugboat company.

*Figure 2:  
Tug fendering  
arrangement.*



## FACILITY INFORMATION

The ConocoPhillips Refinery pier is located along the Strait of Georgia in Whatcom County, Washington. It is about 2.5 miles southeast of Cherry Point and 10 miles northwest of Bellingham. The dock is accessible by a causeway that extends over 1,000 feet from land. The dock runs roughly south-southwest from the causeway, is 785 feet long, 96 feet wide, and can handle two vessels at the same time. Small vessels or barges may use the east side berth (inside) and larger vessels may use the west side berth (outside).

## ENVIROMENT

The weather at the time of the spill was rainy with visibility of 6 to 8 miles and winds from the east-southeast at 8 knots.

Predicted low tide at 0453 was 5.5 feet above mean lower low. At the approximate time of the spill the tide was rising with the predicted current towards 326° at 0.1 knots.

## CHRONOLOGY

All times are approximate Pacific Standard Time and courses are referenced from true north.

### *Monday, January 17, 2005*

**2220** - The tug boat NA HOKU approached the ConocoPhillips refinery pier with the empty tank barge NOHO HELE under tow. The NA HOKU shortened up the tow and then made up to the NOHO HELE's port side.

**2305** - The first line from the NOHO HELE was on the pier.

**2320** - The NOHO HELE was made fast to the ConocoPhillips pier.

Tuesday, January 18, 2005

**0010** – The Declaration of Inspection (DOI) was completed and signed by the barge's Person in Charge (PIC) and the terminal PIC.

**0045** - ConocoPhillips commenced loading 54,000 barrels of diesel to the barge.

The cargo plan was to load the barge to the load line marks and transport the diesel to Tacoma.

**0045 – 0630** - The cargo transfer procedures were going according to the barge PIC's plan.

~ **0400** – The barge PIC began topping-off tanks according to plan, starting with the No. 2 tanks.

~ **0630** – Loading was stopped when diesel was discovered in the water.

The barge PIC recalled that he was filling the #4C tank and checking on the load lines when he noticed the diesel in the water between the tug and the barge and called terminal personnel to shut down the transfer operation.

**0700** – The tug Master contacted the company's Qualified Individual (QI) and informed him of the situation. The QI began notifications to Washington State Maritime Cooperative (WSMC), the U.S. Coast Guard, their oil spill response organization (OSRO), and the Washington State Emergency Management Division.

**0710** – The tug crew began deploying sorbent boom in vicinity of the No.2 port cargo tank where there appeared to be a concentration of oil.

**0712** – The tug/barge crew began deploying the onboard containment boom with the barge's response skiff. The skiff was used to inspect the barge hull to try to discover the source of leak. A 3/4-inch crack was discovered in the hull at the waterline between frame 11 and 12, about 7 1/2 feet below the main deck on the port side in the No. 2 port cargo tank.

**0730** – Additional boom was deployed in the water and absorbent pads used to retrieve spilled diesel.

**0735** – The barge began pumping diesel back to the facility.

~ **0830** – The leak from the NOHO HELE was stopped.

**1900** – Cleanup of all amounts of oil determined recoverable was completed.

**2110** – The barge discharge was complete.

**2250** – The barge departed for Bellingham and repairs.

## ANALYSIS

### BARGE HANDLING

The tug NA HOKU and barge NOHO HELE were in a routine voyage to haul diesel from Ferndale to Tacoma. As the tug and empty barge approached the ConocoPhillips facility, the tug shortened the tow and prepared to take the barge along side for docking. The port side of the tug was going to be on the port bow of the barge. All lines required for making up to the barge were kept on the tug.

The tug captain explained the procedure for taking the barge alongside as follows:

- The whole crew of the tug would be involved.
- First the tug takes in the towing wire.
- Then the tug “flops around” on the barge and takes the barge on the “hip” of the tug.
- The tug mate climbs onto the barge and secures the spring line from the tug to a bit on the barge.
- The tug captain uses the aft control station until the spring line is put up, then he uses the port side wing control until the head line is tight.
- After the spring line is secure, the mate takes the headlines up from the tug and secures them around a bit on the barge.
- After the forward head line is made tight, the tug has the barge under control.
- The mate uses the after winch on the barge to pull the surge chain up on deck.
- One bight of surge chain is hauled up before the stopper wire and pelican hook are put on.
- After the surge gear is up on deck, a stern line is run to the barge and tightened with the towing winch.

The Captain had been running the NA HOKU since April or May of 2004 and had 17 years of experience working on tow boats. The Captain told an Ecology vessel inspector that the maneuver was “no harder than a usual landing, [he] didn’t notice anything unusual or suspect that the barge may have been holed. The [sic] suggested that if he was a little more sharply pointed towards the barge when he landed his flop it might not have punctured the barge.”

The height of the hole is consisted with the barge being light when this maneuver occurred while approaching the ConocoPhillips pier. The placement of the hole is too high to be consistent with the last time the tug performed the “flop around” maneuver because the barge was loaded when the tug last made up to it in Tacoma. The Captain did not report any other hard contact made with the NOHO HELE.

The tug company’s report stated that the “tug made hard contact during make up to barge”. The company’s causal analysis was “rough weather, high winds, maneuvering conditions very difficult.”

The daily log of the tug NA HOKU indicated that the winds at 1600 were south-southeast at 25 to 35 knots, but by 2000 had subsided and become easterly at 10 knots. The log stated the sea state was a swell with wind-wave.

From the Captain’s statement it appeared it was more the angle of contact with the barge rather than the force alone which caused the puncture. The Captain was not aware of the tug having holed the barge and so he took no steps to inform the barge PIC or facility about possible damage to the hull of the barge. The Captain did not make a visual inspection of the area of the barge under the tug fenders.

An examination of the barge revealed a puncture hole in the side of the barge. An estimated 416 gallons of diesel fuel entered the waters of the state.

*Figure 3:  
The puncture in  
the side of the  
NOHO HELE.*



*Figure 4:  
The puncture in  
the side of the  
NOHO HELE.  
The small  
fracture is  
within the  
indentation.*



## CAUSAL INFORMATION

Based on the information gathered, the cause of the spill was a  $\frac{3}{4}$ -inch crack in the No. 2 port cargo tank. Factors contributing to the spill included contact between the barge and a bolt in the tug's fendering system, and the design of the fendering system.

*Figure 5:  
Shows the  
damaged bolts  
believed  
responsible for  
piercing the hull  
of the NOHO  
HELE.*



## LESSONS LEARNED

This was the first of two oil spills involving a single-hulled tank barge damaged by its tug during berthing in the first two months of 2005. The second was the tank barge PB-20 which was damaged as a result of hard contact between it and the tug SEASPAN CAVALIER. In both cases, a spill was discovered as the tanks neared planned capacity. In both cases, the barges were not boomed prior to loading. In both cases, the available external hull of the cargo block was not inspected prior to loading the barge—although in the case of the PB-20 there was a company policy that required it. In addition, a small spill was reported in October 2004 from the PB-20 as a result of tug-induced hull damage.

Pre-booming single-hulled tank barges before loading operations should be considered as a precautionary measure under conditions where booming is both safe and effective, if a visual inspection of all available external hull surfaces can not be made.

## PREVENTION RECOMMENDATIONS

Ecology made prevention recommendations to the owners of the tug/barge, to the U.S. Coast Guard and to Ecology for enhancing oil spill prevention for single-hulled tank barges.

To Owners/Operators of tugs and barges:

- Develop a procedure under which your tug crews handling single-hull tank barges and the tankermen-PICs of such barges work together to visually inspect all available external hull areas in the cargo block prior to loading cargo. Require that the result of the inspection be logged.
- Assign two tankermen, or a tankerman and tankerman's assistant, to a tank barge for loading operations at night to assist with topping off operations and inspecting the surrounding water for possible oil spills.

To the U.S. Coast Guard:

- Consider specifically requiring that all single-hulled tank barges be visually inspected over all available external hull areas in the cargo block before loading operations commence.

- Consider prioritizing the pre-booming of single-hulled tank barges prior to loading operations. If pre-booming is not feasible due to safety or environmental conditions, make the completion of a visual inspection of all available external hull areas in the cargo block a condition of the transfer.

To Ecology:

- Consider specifically requiring that all single-hulled tank barges be visually inspected over all available external hull areas in the cargo block before loading operations commence.
- Consider prioritizing the pre-booming of single-hulled tank barges prior to loading operations. If pre-booming is not feasible due to safety or environmental conditions, make the completion of a visual inspection of all available external hull areas in the cargo block a condition of the transfer.

In reviewing the NOHO HELE incident, the vessel operator has:

- Repaired barge under class approval.
- Cut off the attachment bolts and nuts and the fender retainer is secured by welding alone.
- Provided procedures or amplifying guidance to tug Masters to thoroughly inspect the landing area on the barge after hard contact to ensure no damage was done—including action to shift the tug as necessary to look under fendering points.
- Provided procedures or amplifying guidance to tug Masters to communicate information to the attending tankermen about any hard landings so the PIC can accomplish additional inspections, and so the PIC's awareness is heightened during barge loading.

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## More Prevention Bulletins

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- PB 06-01: The PACIFIC EXPLORER (WDOE#06-08-018)
- PB 06-03: The SEA SYNERGY (WDOE#06-08-038)
- PB 05-01: The TAI SHAN HAI (WDOE#05-08-004)
- PB 03-01: The OVERSEAS WASHINGTON (WDOE#03-08-001)
- PB 01-01: The ARCO TEXAS (WDOE#01-08-006)
- PB 01-01: The SUPER RUBIN (WDOE#01-08-002)
- PB 99-02: The MONCHEGORSK (WDOE#99-261)
- PB 99-01: The ANADYR (WDOE#99-250)
- PB 98-01: The ARCADIA (WDOE#98-253)
- PB 96-02: BARGE 101
- PB 96-01: The KEYSTONE CANYON
- PB 95-02: The VERBIER
- PB 95-01: The DONA V

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