

**Coast Guard Report of Investigation:**  
**Grounding of the Tank Vessel SEABULK PRIDE in Cook Inlet**  
**February 2<sup>nd</sup>, 2006**

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## **Summary**

On February 2, 2006 at approximately 0523 (all times are Alaska Standard Time) the tank vessel SEABULK PRIDE's mooring lines parted at the Kenai Pipe Line (KPL) Dock in Nikiski, Alaska. The ship went adrift and grounded approximately one-half mile north of the pier near the East Forelands.

The vessel was pushed parallel to the dock by a sudden force generated by ice and current, this was the initiating event. At 0523 the two after spring wires parted within seconds of each other and the order was given to shutdown the loading operation. The mooring lines continued to part, come free from hooks, and spool off their winch reels setting the ship adrift in the flood tide. The cargo hoses parted as the ship drifted away from the pier, discharging as much as 5 BBLs of product into Cook Inlet. At 0530 the port anchor was let go, with four shots of chain, to check the motion of the vessel.

The vessel grounded near the East Forelands and remained relatively static until it was re-floated following the initial damage surveys. The vessel transited to Homer and anchored in Kachemak Bay pending a more thorough inspection of the damage and completion of the Coast Guard on scene investigation.

At the time of the incident the vessel was not in full compliance with the ice guidelines issued by the Captain of the Port, Western Alaska. The vessel did not meet the recommendation to be in immediate standby, was not moored in preparation for a worst case scenario, and the bridge was not manned with an underway watch. A combination of tidal conditions, poor line handling, and ice flows all contributed to the break away and subsequent grounding. The ice flows and current were the clear initiating factor in this casualty.

The on scene risk assessment conducted was inadequate for the situation faced. The only sure course of action that would have prevented this casualty was to require the ship to depart the terminal during the icing conditions experienced. The forces generated at max flood combined with ice present a substantial risk to a vessel moored at the KPL dock.

## **Jurisdiction & Authority**

The SEABULK PRIDE is a U.S. Flagged vessel, and the casualty occurred on a navigable waterway of the U.S.

33 USC 1227 authorizes the investigation of any incident, accident, or act involving damage to a waterfront facility, or which affects or may affect the safety or environmental quality of the ports, harbors, or navigable waters of the United States.

46 USC 6301 provides the authority to conduct marine casualty investigations, as well as sets forth the scope of the investigation of marine casualties and incidents.

## **Level of Investigation**

The Investigation into the grounding of the T/V SEABULK PRIDE was conducted at the informal level as directed by the Commander of the 17<sup>th</sup> Coast Guard District.

## **1. Findings of Fact**

### **1.1 Vessel Description**

The third of five Double Eagle tank ships built, the SEABULK PRIDE was laid down at Newport News Shipbuilding on October 28, 1996. The vessel was delivered to Seabulk Tankers (then Hvide Marine Inc.) on October 15, 1998. Originally named HMI NANTUCKET SHOALS, the ship was renamed SEABULK PRIDE on November 20, 2001. The SEABULK PRIDE is a double hull petroleum and petroleum product tanker, with a carrying capacity of 342,000 bbls of cargo in 14 tanks.

The SEABULK PRIDE frequently calls on ports in Alaska, Hawaii and the West Coast of the United States. In 2005 the vessel made 25 trips to Nikiski and 17 trips to Valdez.

Seabulk Tankers Inc. is a ship management company based in Fort Lauderdale, Florida. They operate ten U.S. flagged chemical and petroleum product tankers in the Jones Act trade.

### **1.2 Vessel Particulars**

Name: SEABULK PRIDE  
Flag: United States  
Service: Double Hull Oil Tanker  
Gross Tons: 30,415  
Deadweight Tons: 46,069  
Length Overall: 183.0 meters/ 600.39 feet  
Breadth (MLD): 32.2 meters/ 105.64 feet  
Depth (MLD): 19.15 meters/ 62.83 feet  
Homeport: Port Everglades, FL  
Date Keel Laid: 28 October 1996  
Date Delivered: 15 October 1998

IMO Number: 9118630  
Owner: Lightship Tankers III Inc.  
Operator: Seabulk Tankers Inc.  
Classification Society: American Bureau of Shipping  
Capacity: 342,000 bbls @ 98%  
Endurance: Approximate 17,000 NM  
Center of Manifold to Bow: 93.08 meters/ 305.38 feet  
Center of Manifold to Stern: 89.92 meters/ 295.01 feet  
Draft at which propeller is submerged: 6.8 meters/ 22.31 feet

### **1.2.1 Main Engine**

The main engine is a two stroke, single acting, crosshead type direct reversible, turbocharged. MAN B&W 6L60MC Mk V. Maker: Kawasaki, Japan.N.C.R.: 9,180 BHP at 92 rpm  
Fuel Oil Consumption: 30 tons @ 14 knots (sea steaming- no tank cleaning or cargo heating including auxiliaries), Fuel 380 cST- ISO RMG 35

### **1.2.2 Generators**

- Two (2) Daihatsu 6DKB-20 diesel engines 900 bhp x 900 RPM Hyundai (Korea) generators. 600 KW, 450 V, 60Hz, 3 phase.
- One (1) Daihatsu 6DK-20 diesel engine 1250 bhp x 900 RPM with Hyundai (Korea) generator, 850 KW, 450V, 60Hz, 3 phase.
- One (1) MAN diesel emergency generator 160 KW.

### **1.2.3 Cargo System**

Seven grades of cargo can be loaded or discharged simultaneously. The seven independent cargo systems are interconnected via a mixmaster which uses valves and line blinds. The system is capable of a complete vessel discharge in 20 hours including stripping the tanks using:

- 3 pumps each rated at 8,800 bbls/hr located in the pump room
- 4 deepwell pumps each rated at 3,100 bbls/hr

The cargo piping system is capable of seven grade double valve segregation. Remote cargo pump operation can be conducted from the cargo control room.

Gauging: There are remote tank gauging, temperature reading and cargo loading computers fitted in the cargo control room providing one of the ships officers with online trim and stability, strength, as well as cargo & ballast information.

Tank Cleaning: Each cargo tank has three TOFTEJORGE fixed tank cleaning machines.

Cargo Heating: Stainless steel heating coils are fitted in each cargo tank, meeting the shell heating requirements.

SPM: OCIMF single point mooring provided.

Crane: The hose handling crane is rated for 10 tons.

IG/Vapor Recovery: IG and vapor recovery services are provided by three

independent headers. The IG plant, rated at 185,000 ft<sup>3</sup>/hr, can operate on the IG generator.

All cargo tanks are fully coated with a pure epoxy coating, 2-coat system, and a total dried film thickness (DFT) of 300 microns.

Paint supplier: Ameron Coatings

Paint type: Amercoat 90HS

#### **1.2.4 Ballast System**

Tanks: There are five (5) pairs of wing/double bottom ballast tanks. The complete segregation of ballast system from cargo system is provided and allows for simultaneous ballast/cargo operations.

Coatings: All ballast tanks are coated with epoxy, two (2) coats with a total DFT of 300 microns.

Paint Supplier: Ameron Coatings Paint

Type: Amercoat 385

Pumps: 2 x 250,000 gph x 25 (TH) ballast pumps.

#### **1.2.5 Fire Fighting Equipment**

CO<sub>2</sub> Systems: Fixed high-pressure CO<sub>2</sub> systems are installed for fire protection of the engine room, pump room, emergency generator room, paint room, garbage room, and incinerator room.

Maker: UNITOR

Foam System: The deck foam system is installed to provide fire protection over the cargo block.

Maker: UNITOR

Fire Pumps: Sea water system for the cargo tank area, engine room, accommodations, living quarters, and pump room is provided from (1) centrifugal, electric driven fire and foam pump, 305 m<sup>3</sup>/hr. @ 92mLC.

Maker: SHINKO and One (1) vertical centrifugal, self-priming, electric driven emergency fire pump, 105 m<sup>3</sup>/hr, 95mLC.

Maker: SHINKO

#### **1.2.6 Vessel inspection information**

The SEABULK PRIDE is classed as an +A1 Oil carrier with unrestricted service by the American Bureau of Shipping. A review of survey records for the three year period before the February 2, 2006 casualty revealed normal deficiencies for this vessel's age, route and service.

There was one outstanding condition of class on 02 February 2006 that was noted from a 20 October 2005 ABS survey:

On 20 October 2005, two small holes were found to be temporarily patched in the ship's ballast piping. One hole was found on the suction side of the #1 salt water ballast pump and one was found on the discharge of the #2 salt water ballast pump.

Recommendation: It was recommended that temporary patches be removed and piping repaired or replaced to the satisfaction of the attending surveyor prior to the crediting of the dry-docking survey due 29 October 2006.

### 1.2.7 Vessel Certificates

All vessel certificates were valid and properly endorsed.

### 1.2.8 Life Saving Equipment

Lifeboats: The vessel is fitted with two covered motor propelled, reinforced fiberglass lifeboats having a capacity of 34 persons each.

Maker: SCHAT-HARDING

Liferafts: The vessel is fitted with two inflatable life rafts, launching type, (1) 20-person capacity and (1) 16-person.

Maker: Inflatable Survival Systems, Inc.

The vessel is fitted with (1) inflatable life raft forward, launching type, capacity 6 persons.

Maker: Inflatable Survival Systems, Inc.

## 1.3 Environmental Conditions

At the time of the incident winds were out of the west at 7 KTS and the air temperature was 6° F. Ice conditions were observed to be generally moderate, with small to medium pans and slush ice covering 50 to 60% of the water's surface. The combination of the westerly wind and the flood tide worked to move ice into the vicinity of the KPL Dock. Following the breakaway the crew of the vessel reported 100% ice coverage.

Tidal range was 26.3' for the morning of 02 February 06. The calculated current was at a maximum of 5.4 kts at 0527 according to the current tables used by the Southwest Alaska Pilots Association (SWAPA). According to the SWAPA the flood current acts in a parallel direction to the pier in a general direction of 342° T.

## 1.4 Crew on board at time of incident

<u>Last Name</u>	<u>First Name</u>	<u>Middle Int.</u>	<u>Gender</u>	<u>Nationality</u>	<u>DOB</u>	<u>Position</u>
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POTTER	STEWART	C	Male	U.S.	10/11/1957	Master
JOHNSON	PAUL	D	Male	U.S.	04/21/1966	Chief Mate
GRIFFITH	KEVIN	W	Male	U.S.	05/17/1963	Second Mate
SCHARRENWEBBER	GEORGE	P	Male	U.S.	06/14/1981	Third Mate
STEWART	ANDREW	C	Male	U.S.	06/21/1982	Third Mate
ADAMSKI	DANIEL	S	Male	U.S.	05/12/1985	Deck Cadet
DAVIS	PETER	J	Male	U.S.	10/30/1958	Chief Engineer
PATTERSON	PAUL	E	Male	U.S.	09/27/1946	First Assistant Engineer
BAKER	DONAVON	B	Male	U.S.	02/25/1969	Second Assistant Engineer
OUK	JACK	K	Male	U.S.	07/27/1980	Third Assistant Engineer
NARRO	PAUL	B	Male	U.S.	09/22/1970	Bosun
AHMAD	MIAN	I	Male	U.S.	01/01/1955	Able Seaman (Dayman)
OSTROWSKI	MICHAEL	W	Male	U.S.	09/08/1953	Able Seaman (Dayman)
JOHNSON	KEVIN	W	Male	U.S.	12/07/1978	Able Seaman
SIMPSON	MARC	A	Male	U.S.	08/12/1970	Able Seaman
VIRAY	LIBERATO	Z	Male	U.S.	12/20/1963	Able Seaman
GANETO	JOAQUIM	J	Male	U.S.	10/02/1971	General Vessel Assistant
CALLEJAS	MARINO	D	Male	U.S.	09/02/1959	QMED
PRATTS	CARY	G	Male	U.S.	02/20/1956	Pumpman
QUARTEY	JOHN	N	Male	U.S.	02/18/1947	Wiper
CURLEY	ELENA	R	Female	U.S.	10/23/1945	Steward
FALLAH	ABDULLAH		Male	U.S.	03/05/1959	Cook

## 1.5 Narrative of Events

Coast Guard ice guidelines for Upper and Lower Cook inlet and the extreme ice guidelines were in effect at the time of the incident. At 1354 on January 30, 2006 the SEABULK PRIDE arrived at the KPL Dock in Nikiski, Alaska to discharge a cargo of crude oil and load a cargo of heavy vacuum gas oil (HVGO), high sulfur fuel oil (HSFO) and regular unleaded gasoline (RUL). After taking on bunkers and washing tanks the vessel began loading cargo. At 0500 on February 2, 2006 the vessel had completed its loading of HSFO and was taking on HVGO and RUL through a total of 2 hoses.

The Master departed the bridge of the vessel at 0300 on the morning of February 2nd. The pilot on duty was Captain Jeffrey Pierce, standing his 1<sup>st</sup> six hour watch from Midnight to 0600. His relief at 0600 was scheduled to be the other pilot on-board, Captain Richard Desautel.

Jeffrey Pierce has been with the South West Alaska Pilots Association for 21 years and had substantial knowledge of the ice guidelines and the danger of the ice and current present in Cook Inlet. Capt. Pierce was watching for ice and noticed it

had diminished around 0300 and at 0500 there was no observed ice in the vicinity of the vessel.

At 0515, according to the pilot, ice began flowing near the vessel again, and quickly rose to approx. 50-60% coverage. Strain gages at the facility suggest that a strain in the mooring lines increased within 6 seconds to an approximate tension of 50 to 100 tons. The exact tension was impossible to determine due to the inexact readings provided by the strain gauges when a line parted. Video footage from the facility shows a significant but not alarming amount of ice moving past the dock following the break away. Medium sized pans were distinguishable.

Prior to the 1<sup>st</sup> line parting, the A/B on deck was in the process of tending lines. He had begun at the bow of the ship and worked his way aft releasing tension on the lines via the hydraulic winch controls. The tension diagrams for the mooring lines provided correspond with this account of events and it is possible to identify each instant when the lines were slacked.

At 0523 the after spring wire (BP2B) parted, followed shortly by the other after spring wire (BP2A). (See mooring wire diagram Enclosure ECN-2578263-CMS #111 ) At this time the order was given to shutdown the loading operation. The two A/B's on watch were conducting their second round of the vessel to slack mooring lines when the first line parted. Line BP2A had just been slacked leaving most of the strain on the aft spring wire BP2B. This was the first line to part.

A/B Leto Viray was standing nearby and saw line BP2B part between the winch and the chock. Mooring lines continued to part or spool off their winch reels over the next three minutes. At one point the ship was being held by the loading arms for approximately 30 seconds before they parted according to one eyewitness account. The ship was then adrift in the flood tide drifting towards the East Forelands.

The pilot went to the Captain's stateroom where he found the Captain on the phone with the chief engineer. Upon confirming the Captain was aware of the situation, the Pilot then returned to the bridge and saw the cargo hoses holding the ship to the pier and watched them part. The Pilot ordered anchors dropped with 2 shots let go. Only the port anchor could be released due to the starboard one being frozen in place by ice. The pilot ordered the scope of the chain increased to 4 shots on the port anchor at 0530.

The pilot, Capt. Pierce, placed the rudder hard right in an effort to stop the ships heading from turning towards shore. The pilot was afraid that a slight shift in heading would place the vessel in an unavoidable grounding situation instead of being pushed by the current into Cook Inlet. This attempt to alter the head of the vessel failed and the current kept the bow pointed slightly into the shoreline.

The 1<sup>st</sup> A/E in the engine room at time of incident was having coffee prior to the start of his work day. He was not standing an engine room watch, instead he was preparing for the routine in port work day. The engines had air secured, oil secured, jacking gear engaged, and air indicating cocks open. The call came from the bridge for engines and the 1<sup>st</sup> A/E started to make the engine ready to start. He disengaged the jacking gear, shut the drains for the turbochargers, opened the start air and the distribution air, and finally shut the 6 air indicator cocks. The engine was then placed in bridge control. According to the engine room automation log, and bridge logs this took approximately 4 min from start to finish.

Once the Engineers notified the bridge that the engines were in bridge control, a start was attempted immediately. According to the engine room automation log, the first bridge start attempt was at 0527. The engines failed to start after at least 12 start attempts. Continued start attempts failed but were continued until at least 0535. The start air receiver gave a low pressure alarm at 0529 for both receivers. It was determined that the vessel grounded at 0.63 NM NNW of the KPL dock at 0536.

It was later determined that the failure of the engines to start was due to multiple synthetic lines (approx 140' total) fouling the propeller. The direct drive engine was able to start once two mooring lines leading from winches on deck down into the vicinity of the prop were parted. These two wire lines parted during the 1<sup>st</sup> mid-morning attempt to free the vessel. The release of tension on these lines allowed the motor to generated enough force to start and continue to run.

An attempt was made between 0830 and 0930 on 02 February 06 to free the vessel. It was during this attempt that the lines leading from the winches to the props parted. A second attempt was made that evening at 1845, which was aborted due to mechanical problems with one of the assist tugs. The final and successful attempt to free the vessel was made at 0730 on 03 February 06.

After the vessel was floated free there was a difference from the ordered and actual RPM's during the transit to Homer indicating a line was still wrapped around the prop. Divers discovered a mooring line wrapped around the prop when they conducted an underwater survey on the vessel in Homer. It was estimated by the divers that approximately 100'-150' of synthetic line was wrapped around the propeller shaft between the aft stern tube seals and the propeller.

### **1.5.1 U.S. Coast Guard Response Timeline**

All times listed in Alaska Standard Time

#### 02 February 06

0523 T/V SEABULK PRIDE broke away from the dock while transferring oil  
0549 CG 6021 (HH-60) was Airborne from AirSta Kodiak to T/V  
0557 MSD Kenai made the initial notification to MSO Anchorage  
0700 ICS Command Center stood-up at CISPRI in Nikiski, AK  
0715 T/V master reported vessel is one half mile from shore with 100% ice coverage  
0745 MSO Anchorage contacted MSD Kenai for updates

0800 Tug's GLACIER WIND and STELLAR WIND were en-route to T/V from Anchorage  
0800 MSO Anchorage updated D17  
0810 COTP Western Alaska arrived in Kenai and informed MSO Anc that the vessel's heading is 135 degrees T, there is no movement in the cargo tanks, there were two wire lines hanging on the port side, and the prop was free and turning.  
0837 MSD Kenai updated MSO Anchorage on the situation  
0845 MSO Anchorage briefed the unit and prepares other personnel to leave  
0857 MSO Anchorage briefed the Pacific Strike Team  
0859 MSO Anchorage briefed the COTP Western Alaska  
0900 COTP Western Alaska briefed D17 Commander  
0903 MSO Anchorage briefed and updated U.S. Department of the Interior  
0913 MSO Anchorage briefed and updated Pacific Strike Team  
0950 CG 1790 (C-130) Diverted to Juneau to transport D17 Commander to Nikiski, AK  
0956 MSO Anchorage received the resource list from D17  
1030 Three MSO Anchorage personnel (ICS) en-route to Nikiski via commercial air  
1040 MSO Anchorage received call that a NTSB investigator is being dispatched  
1051 CG 6021 (HH-60) was on scene with the T/V  
1110 CG 6021 (HH-60) Departed T/V en-route Kenai Airport to conduct maintenance  
1119 CG 6021 (HH-60) Landed at Kenai Airport to conduct maintenance and await further tasking from D17  
1130 Three MSO Anchorage personnel (ICS) arrived at the Nikiski Command Center  
1147 MSO Anchorage received the photos of the over flight  
1155 MSO Anchorage Investigators received confirmation that the drug and alcohol testing was completed for the crewmembers and pilot involved  
1200 Tug's GLACIER WIND and STELLAR WIND arrived at T/V to attach lines to control T/V  
1200 MSD Kenai updated MSO Anc  
1215 Two MSO Anc Investigators depart en-route Nikiski via Government Vehicle  
1220 CG 1790 (C-130) Landed at Kenai Airport and delivered D17 Commander to awaiting transportation  
1221 CG 1790 (C-130) Released and returned to AirSta Kodiak  
1228 CG 6029 (HH-60) was airborne from AirSta Kodiak to conduct over flight of T/V and change pilots on the T/V  
1243 COTP Western Alaska conducted conference call with Commandant, ADM Collins, ADM Johnson, CAPT Glenn W/ CDR Woodring/ CAPT Hudson, ADM Cross, HQ Command Center, and ADM Gilmour  
1245 MSD Kenai updated MSO Anchorage  
1530 CG 6029 (HH-60) Landed at Kenai Airport awaiting two marine pilots  
1546 CG 6029 (HH-60) was airborne from Kenai Airport en-route T/V  
1555 CG 6029 (HH-60) was on scene with the T/V switching marine pilots  
1600 Federal Pollution Case was raised from \$25k to \$100k  
1600 CG 6029 (HH-60) Pilot hoist completed, en-route to Kenai Airport to offload pilots  
1607 CG 1790 (C-130) Landed at home base, AirSta Kodiak  
1620 Two MSO Anchorage Investigators arrived in Nikiski and proceed to KPL dock to begin investigation of the incident  
1625 CG 6029 (HH-60) Landed at Kenai Airport awaiting further tasking  
1921 CG 6029 (HH-60) was airborne from Kenai Airport to stand-by for attempts to refloat T/V  
1930 CG 6029 (HH-60) Notified by T/V that no attempts to refloat will be made due to equipment problems

1931 CG 6029 (HH-60) released by D17 to return to home base, AirSta Kodiak  
2215 CG 6029 (HH-60) Landed at AirSta Kodiak

#### February 3, 2006

0700 Federal Pollution Case raised from \$100k to \$500k  
0834 T/V was off the beach and in tow  
0840 T/V underway on its own power en-route to Homer, AK anchorage  
1043 T/V southbound in Cook Inlet at 11kts. It was accompanied by M/V's CHAMPION, MONARCH, PACIFIC CHALLENGER, Tug's GLACIER WIND, and STELLAR WIND. Tug SEA VOYAGER from Valdez met the T/V en-route to Homer. Initial damage survey found no compromise to the vessels tanks  
1101 Update to survey: Observed minor inset of bottom plate port side aft of pump room with noted longitudinal and transverse bottom framing deflected. Structural members remain intact with no flooding or compromise of the hull observed at this time.  
1224 Tank readings indicated ballast tanks 2P, 5P, and 4S showing ingress of water. Evaluated further prior to entry into Kachemak Bay  
1500 Two MSO Anchorage Investigators and one MSD Kenai Inspector departed Nikiski en-route Homer to board the T/V at anchor  
1730 MSO Anchorage Senior Investigating Officer en-route Homer via commercial air  
1800 Two MSO Anchorage Investigators and one MSD Kenai Inspector arrived in Homer  
1830 MSO Anchorage Senior Investigating Officer arrived in Homer  
2000 Three MSO Investigators and MSD Kenai Inspector began investigations on the T/V  
2100 Nikiski Command Center demobilized  
2130 Three MSO Anchorage personnel (ICS) departed Kenai en-route Anchorage via commercial air  
2215 Three MSO Anchorage personnel (ICS) arrived in Anchorage, Mission Complete

#### February 4, 2006

All Day: MSO Anchorage Investigators (3) and MSD Kenai Inspectors (2) were on board SEABULK PRIDE

#### February 5, 2006

0900 MSO Anchorage Investigators departed Homer en-route Nikiski (KPL Dock) to continue investigation  
1230 MSO Anchorage Investigators arrived in Nikiski (KPL Dock) and continued investigation  
1500 MSO Anchorage Investigators departed Nikiski en-route Anchorage

### **1.5.2 Pollution & Pollution Response Efforts**

A complete summary of pollution response efforts may be found in the SEABULK PRIDE FOSC after action report. This report can be found in evidence enclosure ECN-2578263-SBG-#109: M/V SEABULK PRIDE FOSC After Action Report

## **1.6 Drug and Alcohol Testing Results**

Drug and alcohol testing was conducted on all parties on watch at the time of the initial break away and who had a direct role in the casualty.

All drug test results were negative. All alcohol test results were negative.

## **2.0 Analysis**

The Coast Guard ice guidelines were in effect and all parties were familiar with the ice guidelines. The ice guidelines were followed with several exceptions. There was not a seagoing watch on the bridge of the vessel as required by the extreme ice guidelines. The engine room was not manned to keep the engines in immediate standby. These deviations contributed to the failure to prevent the vessel from grounding but strict adherence to these guidelines alone may not have prevented the accident.

The main engine had the fuel feed, start air, and other systems secured. It was able to be started soon after the lines had parted but only due to the off duty 1 A/E's presence in the engine room. This coincidence saved the several minutes it would have taken the duty engineer to reach the engine room.

The facility's operations manual called for mooring lines to be doubled or tripled in extreme ice conditions. They also stated that transfer operations should be suspended within two hours of max flood and max ebb currents during ice conditions. For the purpose of suspending transfer operations, it did not distinguish between extreme ice conditions or standard ice conditions. It should be noted this incident occurred within one minute of the calculated max flood. These policies were not followed.

When CG investigators were presented with the operations manual there were pen and ink changes that the facility claimed had been made prior to the incident. No proof of routing or verification of changes could be provided to investigators. The pen and ink amendments submitted to the CG state that a sufficient number of lines shall be used. The ice section of the operations manual was not required by CG regulation.

During the interview the Master seemed to be unaware of the exact status of the engine, but knew there would be a small delay in start time when calling for engines. His initial statements to investigators was that the engine jacking gear was not engaged, indicating some degree of unfamiliarity with the status of the engines. He felt comfortable, as did the pilots, with the response time of the engine room to the request for start attempts.

There was limited communication between the vessel and the facility regarding the status of the mooring lines or the ice conditions. The vessel did not have access to the shore side mooring line tension gage information. The mate on watch in the cargo room had no warning of the increased strain on the mooring lines until they parted.

There was insufficient training for the Able Seamen on the vessel's written ice guidelines or on the specifics of line handling during heavy ice conditions. Specifically: One AB on watch had only 27 days experience on board the vessel and was working for his first time in Cook Inlet during ice guidelines conditions. For a period of time, he was working alone tending lines without the presence and benefit of an experienced AB to provide him guidance on vessel's equipment. This contributed to his releasing too much strain on the mooring lines, which in turn compromised the strength of the mooring system.

There was inadequate record keeping with regards to ground tackle aboard the vessel. After the high wind damage received while the vessel was moored at the KPL Dock one week earlier, there were some substantial repairs and replacement of mooring lines and re-setting of the winch brakes by the Chief Mate. The detailed logging and/or recording of those repairs were inadequate or missing altogether.

### **3.0 Conclusions**

The Coast Guard Marine Safety Center report suggests that mooring lines with a higher breaking strength may have precluded the incident. The mooring system was clearly inadequate for the conditions faced on the day of the incident. At least one line was observed to have been hand spliced. This line should have been evaluated and de-rated due to the decreased strength resulting from the hand splice.

Involved parties failed to conduct an adequate risk assessment of the situation. The conditions in Cook Inlet following a long cold spell were not conducive to vessel operations without additional operational controls. The vessel may not have been pushing ice during the transit as is mentioned in the Coast Guard ice guidelines but this appears to be due to wind which was holding the ice further out of the inlet or offshore. There is no indication that the possibility of a large flow of ice coming back near the dock was discussed. There appeared to be a degree of complacency in regards to the risk ice presented. There was awareness of the risk of being wedged away from the dock by ice, but not being pushed parallel to the pier by it. The on scene risk assessment of ice conditions was unsatisfactory as the ship was quickly placed in a situation that caused it to break away from the dock.

There was improper slacking of the lines during the tending process. At several points during the line tending process strains were noted by tension gages above the SWL of the mooring lines. The failure of the first mooring line was exacerbated by the failure of other lines to arrest the aft motion of the ship or to carry any substantial load. In essence one line was carrying the bulk of the fore-aft loading. Most of the other lines intended to stop the aft motion of the ship were not carrying a load as intended in the mooring arrangement. It is possible that if the lines which were not carrying load had been loaded prior to slacking lines that were exceeding the SWL, the mooring system may not have failed.

The vessel was only able to attempt starts as quickly as it did due to the presence of the off duty 1<sup>st</sup> A/E engineer in the engine room preparing for day work. The engine room

was not properly manned for maneuvering operations at the time of the initial incident and did not meet the requirements to keep the engines in immediate standby. There was a 4 minute delay between the break away and the first attempt at engines being started. The manning of the engine room did not coincide with the Coast Guard ice guidelines expectations.

This incident was caused by a massive force directed on the bow of the ship pushing it parallel to the dock. The logical assumption is that this force was caused by an unseen large flow of ice and the max flood current. This is not the generally expected risk from ice at this location. Ice will normally wedge between the vessel and the shoreline generating a force perpendicular to the dock. Given the magnitude of force placed on the vessel by the ice flow it is unlikely that any action the ship's crew could have taken would have saved it from grounding once it had broken free of the dock.

## 4.0 Recommendations

- A discussion of mooring arrangements and ice conditions between the facility and vessel similar to a Declaration of Inspection required by 33 CFR 156.40 needs to occur and be documented in writing. This discussion should include an understanding of conditions that would require the vessel to depart the terminal and what deviations should be made from the standard mooring arrangement. The development and format of this agreement should be formalized by a working group of the Cook Inlet Navigational Safety Committee.
- The facility and vessel should review the mooring details in relation to the observed weather and ice conditions to ensure the SWL of the mooring lines is not exceeded. The review of the mooring details should include the expected forces on the mooring lines at spring tide and in varying ice conditions.
- Both the vessel and facility need to ensure all personnel working with mooring lines have been adequately trained and briefed on all pertinent information regarding vessel and facility written plans, including recent updates. This should include adequate OJT, instructions on all line-handling equipment with regards to limitations and procedures, and a formalized mishap reporting system on the mooring systems that are shared between the facility and the vessel.
- Mousing hooks should be installed on the facility hooks to preclude lines from coming off of the hooks as the ship surges against the pier. This simple engineering fix would have kept a number of lines attached to the pier delaying the break away process.
- The Coast Guard ice guidelines should be re-written to include a clearer definition of "immediate standby". It should be clarified what the exact standard is for diesel, steam, or gas turbine propulsion plants relative to the term immediate standby. For a direct drive slow speed diesel, what is acceptable immediate standby? This definition should be agreed upon by the Cook Inlet Navigation Safety Committee
- An assessment should be conducted to determine the feasibility of an ice break bulkhead to reduce the forces on the vessel generated by large ice flows. This engineering fix could preclude a situation similar to the grounding in the future and should be explored through further engineering analysis.

- The line tensionometer readings need to be made available to the vessel’s crew in order to facilitate proper line tending. A visual display should be available to the mate on watch to ease supervision of the line tending process and provide an immediate visual alarm of high strain on lines.
- A preseason meeting with waterway users to discuss the current ice guidelines and lessons learned from the previous winter should be held. Additionally a post season hot wash should be conducted to collect information and lessons learned at the end of each winter.
- The USCG should conduct spot checks when extreme ice guidelines are in effect to ensure all procedures are being followed by vessels and facilities.
- The USCG should consider a regulatory project to adopt the ice operating guidelines for Cook Inlet into a Regulated Navigation Area

## 5.0 Enforcement Referrals

### 5.1 Master, T/V SEABULK PRIDE

Charge of Misconduct for Violation of U.S. Law or Regulation for 33CFR156.120(a) for failure to ensure that the vessels moorings were strong enough to hold during all expected conditions. The Coast Guard will be seeking 2 month suspension of License and MMD through a settlement process or through a hearing with an Administrative Law Judge.

## 6.0 Appendix

### 6.1 Abbreviations

AB	Able Bodied Seaman holding a valid Merchant Mariners Document
ABS	American Bureau of Shipping
ADM	Admiral
A/E	Assistant Engineer
AIRSTA	Coast Guard Air Station
BBS	Barrels
BHP	Brake Horse Power
CFR	Code of Federal Regulations
CG	Coast Guard
COTP	Captain of the Port
D17	District Seventeen (USCG)
DFT	Dried Film Thickness
DOB	Date of Birth
FOSCR	Federal On Scene Coordinator Representative
GPH	Gallons Per Hour
Hz	Hertz
HSFO	High Sulfur Fuel Oil

HVGO	Heavy Vacuum Gas Oil
ICS	Incident Command System
IG	Inert Gas
JIC	Joint Information Center
KPL	Kenai Pipeline
KW	Kilowatt
MISLE	Marine Information for Safety & Law Enforcement
mLC	Differential head pressure units
MLD	Molded
MSD	Marine Safety Detachment
MSO	Marine Safety Office
NM	Nautical Mile
OJT	On the Job Training
OCIMF	Oil Companies International Marine Forum
P	Port
RPM	Revolutions Per Minute
S	Starboard
SERT	Salvage Engineering Response Team
SPM	Single Point Mooring
SWAPA	Southwest Alaska Pilots Association
SWL	Safe Working Load
T/V	Tank Vessels
VTBB	Vacuum Tower Bottom Blend

## **6.2 Evidence enclosures listing**

### **M/V SEABULK PRIDE Grounding**

#### **Contents**

ECN-2578263-JCS-#1: SITREPS 1-6(Final)

ECN-2578263-JCS-#2: Initial NRC report

ECN-2578263-JCS-#3: Notice of Arrival

ECN-2578263-JCS-#4: Satellite photo of Nikiski Dock

ECN-2578263-SBG-#5: Certificate of Classification

ECN-2578263-SBG-#6: National Vessel Documentation Center Certificate of Documentation

ECN-2578263-SBG-#7: Certificate of Inspection for M/T SEABULK PRIDE

ECN-2578263-SBG-#8: Cargo Ship Safety Equipment Certificate

ECN-2578263-SBG-#9: International Load Line Certificate, and Survey for Load Lines form

ECN-2578263-SBG-#10: International Tonnage Certificate

ECN-2578263-SBG-#11: United States of America Tonnage Certificate

ECN-2578263-SBG-#12: Deadweight Report

ECN-2578263-SBG-#13: Compass Deviation Tables for the standard reflector compass and the magnetic compass aboard the M/T SEABULK PRIDE.

ECN-2578263-SBG-#14: Record of Equipment of Radio Facilities

ECN-2578263-SBG-#15: Deck Department Cold Weather Precautions

ECN-2578263-SBG-#16: Listing of M/T SEABULK PRIDE's certificates and other documents

ECN-2578263-SBG-#17: Engine room logbook

ECN-2578263-SBG-#18: First Assistant Engineer's Logbook

ECN-2578263-SBG-#19: Navigation Instruments List

ECN-2578263-SBG-#20: Radio Equipment List

ECN-2578263-SBG-#21: GMDSS Communication Equipment List

ECN-2578263-SBG-#22: Inventory of mooring winches, soft mooring lines, spare mooring equipment, and transfer hoses, and there locations onboard.

ECN-2578263-SBG-#23: Certificates of testing of wire ropes onboard.

ECN-2578263-SBG-#24: Document of Compliance

ECN-2578263-SBG-#25: Safety Management Certificate

ECN-2578263-SBG-#26: Work hours for the deck department

ECN-2578263-SBG-#27: Document/Other Document

ECN-2578263-SBG-#28: Vessel Certificate of Financial Responsibility (Water Pollution)

ECN-2578263-SBG-#29: Federal Communications Commission radio license, ship radio station authorization, and list of radio facilities available onboard.

ECN-2578263-SBG-#30: Oil cargo grade summary

ECN-2578263-SBG-#31: Rate Sheets

ECN-2578263-SBG-#32: ECDIS display sheet

ECN-2578263-SBG-#33: Mooring Line Configuration Display

ECN-2578263-SBG-#34: USCG investigator MST3 Ryan Johnson's written statement

ECN-2578263-SBG-#35: Evidence Custody Form

ECN-2578263-SBG-#36: Bridge notes

ECN-2578263-SBG-#37: Facility line strain record for aft lines including trend tables.

ECN-2578263-SBG-#38: Facility line strain record for midship lines including trend tables.

ECN-2578263-SBG-#39: Facility record of strain on forward lines including trend tables.

ECN-2578263-SBG-#40: KPL Company dock log sheet

ECN-2578263-SBG-#41: Kenai dock weather report

ECN-2578263-SBG-#42: Written statement of events from Josh Feltman (KPL Dock PIC)

ECN-2578263-SBG-#43: Statement of events from KPL dock PIC Nick Lee

ECN-2578263-SBG-#44: Statement of events from Mike Booth, the control center operator.

ECN-2578263-SBG-#45: Contingency Plan Verification Log

ECN-2578263-SBG-#46: Crude Oil Washing Checklist

ECN-2578263-SBG-#47: Digital photographs taken of evidence at the KPL Dock after the M/T SEABULK PRIDE broke away from its lines.

ECN-2578263-SBG-#48: PowerPoint of M/V SEABULK PRIDE pictures

ECN-2578263-SBG-#49: Kenai Pipeline Company Declaration of Inspection form

ECN-2578263-SBG-#50: Dock Time Log

ECN-2578263-SBG-#51: KPL operating procedures for heavy ice conditions, including an email from the facility manager to employees.

ECN-2578263-SBG-#52: Facility Training documentation: W.P. # 61-Spill Response and Reporting

ECN-2578263-SBG-#53: Facility Training Documentation: KPL Dock Grade Sampler Operation

ECN-2578263-SBG-#54: Facility Training Documentation: KPL Dock Control System

ECN-2578263-SBG-#55: Facility Training Documentation: KPL Dock Crane Operation

ECN-2578263-SBG-#56: Facility Training Documentation: Dock Mooring Load Monitoring System

ECN-2578263-SBG-#57: Facility Training Documentation: Draining Lines Under KPL Dock

ECN-2578263-SBG-#58: Facility Training Documentation: KPL Dock Vessel Mooring and Let-Go

ECN-2578263-SBG-#59: Facility Training Documentation: Vessel Loading/Unloading

ECN-2578263-SBG-#60: Facility Training Documentation: KPL Dock Gasoline Additive Injection

ECN-2578263-SBG-#61: Facility Training Documentation: Dock Hoses

ECN-2578263-SBG-#62: Facility Training Documentation: P-2437 Isolation

ECN-2578263-SBG-#63: Facility Training Documentation: Cold Mechanical Startup

ECN-2578263-SBG-#64: KPL Dock Operations in Heavy Ice for January 31 of 2006 and February 16 of 2006.

ECN-2578263-SBG-#65: Conoco Phillips wind direction and speed log from 2/2/06 400 to 600 hours.

ECN-2578263-SBG-#66: Written statement from Mr. Alan Clark (Ice Watchstander)

ECN-2578263-SBG-#67: National Weather Service Weather Forecast Record

ECN-2578263-SBG-#68: Tide Table Recordings for day of SEABULK PRIDE Incident.

ECN-2578263-SBG-#69: Notes taken from MST3 Ryan Johnson (Duty Officer from MSD Kenai)

ECN-2578263-SBG-#70: Special Operating Procedures for Hazardous Ice Conditions in Cook Inlet, AK (MSO Copy). Special Operating Procedures for Hazardous Ice Conditions in Cook Inlet, AK (M/V SEABULK PRIDE Copies).

ECN-2578263-SBG-#71: SEABULK PRIDE ABS Surveyor notes

ECN-2578263-SBG-#72: Crew List

ECN-2578263-SBG-#73: Kenai Pipeline Dock Company Port Information Guide

ECN-2578263-SBG-#74: Product amount onboard M/V SEABULK PRIDE

ECN-2578263-SBG-#75: M/V SEABULK PRIDE course recorder

ECN-2578263-SBG-#76: Cook Inlet Vessel Contingency Plan

ECN-2578263-SBG-#77: Engine Room Log Book for 1/30/06

ECN-2578263-SBG-#78: Vessel Docking Diagram for the Nikiski KPL Dock

ECN-2578263-SBG-#79: M/V SEABULK PRIDE Port Security Log

ECN-2578263-SBG-#80: Course Reader Tape for M/V SEABULK PRIDE

ECN-2578263-SBG-#81: NORCONTROL Recorder for M/V SEABULK PRIDE

ECN-2578263-SBG-#82: Bridge Logbook for the M/V SEABULK PRIDE

ECN-2578263-SBG-#83: Night Order Book for M/V SEABULK PRIDE

ECN-2578263-SBG-#84: Document/CG-2692 Report of Marine Accident, Injury or Death  
CG-2692

ECN-2578263-SBG-#85: Document/CG-2692B Rpt of Required Chemical Drug/Alcohol Testing  
CG-2692B for M/V SEABULK PRIDE incident

ECN-2578263-SBG-#86: Written statement, concerning M/V SEABULK PRIDE grounding, from Captain Jeffrey Pierce of the Southwest Alaska Pilots Association.

ECN-2578263-SBG-#87: Training Activity and Agenda Report for Tesoro Alaska Company on Spill Prevention and Dock Operations

ECN-2578263-SBG-#88: KPL Dock Mooring System Maintenance Plan Schedule

ECN-2578263-SBG-#89: Photocopy of Cook Inlet chart, including the area of Nikiski and KPL Dock

ECN-2578263-SBG-#90: COTP, Western Alaska Ice Rules and Extreme Ice Rules for Upper and Lower Cook Inlet

ECN-2578263-SBG-#91: Email from LT Jay Jerome of MSO Anchorage, transcribing a voice mail left on his phone from a pilot on the M/V SEABULK PRIDE after it ran aground.

ECN-2578263-SBG-#92: American Bureau of Shipping Statutory Survey Report

ECN-2578263-SBG-#93: Digital Audio Interview Recordings from Chief Mate, Chief Engineer, Facility Manager, and Person in Charge with MSO Anchorage personnel.

ECN-2578263-SBG-#94: Capacity Plan and Deadweight Scale for M/V SEABULK PRIDE

ECN-2578263-SBG-#95: Digital Photographs of M/V SEABULK PRIDE

ECN-2578263-SBG-#96: American Bureau of Shipping Vessel Particulars Document

ECN-2578263-SBG-#97: American Bureau of Shipping Class Survey Reports for years 2003, 2004, 2005

ECN-2578263-SBG-#98: M/V SEABULK PRIDE Deck Logbook

ECN-2578263-SBG-#99: MSTC Reser's handwritten notes

ECN-2578263-SBG-#100: MST1 Christopher Ellison's handwritten notes

ECN-2578263-SBG-#101: ENS Merrill's Digital Photographs from M/V Champion

ECN-2578263-SBG-#102: PAC Strike Team Incident Summary Report

ECN-2578263-SBG-#103: Digital Photographs

ECN-2578/263-SBG-#104: Preliminary Inspection Report from Tesoro KPL Dock

ECN-2578263-SBG-#105: Line Tension Graphs

ECN-2578263-SBG-#106: M/V SEABULK PRIDE Hook Pictures

ECN-2578263-SBG-#107: M/V SEABULK PRIDE Winch Data

ECN-2578263-SBG-#108: THN Recommendations for KPL Dock Inspection

ECN-2578263-SBG-#109: M/V SEABULK PRIDE FOSC After Action Report

ECN-2578263-SBG-#110: Tesoro Mooring Hook Inspection & Dock Survey Results

ECN-2578263-CMS-#111: Mooring Line Diagram