



Kulluk Grounding



Captain Paul Mehler III

Commander, United States Coast Guard Sector Anchorage



“...the inadequate assessment and management of risks by the parties involved was the most significant causal factor of the mishap.”



Commandant
United States Coast Guard

U.S. Coast Guard STOP 1501
2703 Martin Luther King Jr. Ave. SE
Birmingham, AL 35204-1501
Staff Duties: CO-1501
Phone: (205) 375-1000
Fax: (205) 375-1904

16732
April 2, 2014

**REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE
GROUNDING OF THE MOBILE OFFSHORE DRILLING UNIT (MODU) KULLUK ON
THE EASTERN COAST OF SITKALIDAK ISLAND, ALASKA
ON DECEMBER 31, 2012**

ACTION BY THE COMMANDANT

The record and the report of the Formal Investigation convened to investigate the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, conclusions, and recommendations are approved subject to the following comments.

COMMENTS ON THE REPORT

1. While the Investigating Officer correctly identifies a multitude of specific factors that contributed to the casualty in his report, I agree with the District 17 Commander that the inadequate assessment and management of risks by the parties involved was the most significant causal factor of the mishap. Vessels and the operations they conduct are growing more complex, and the risks that accompany these operations increase, whether in Alaskan waters or not. The failure to adequately understand, respect, and not complacently assume past practice will address new risks, is critical both in practice and in company culture. In this case, the risks associated with a single vessel tow by a new purpose-built vessel of a unique conical-shaped hull, with people aboard, in winter Alaskan waters where weather systems and seas are expected to rapidly develop, were extremely high. The consequences of inadequate management of risks impacts all operators, not just the specific company or party involved. Industry, vessel classification societies and regulators have a responsibility to ensure risks are properly addressed, even where the establishment of standards lag industry technological or operational developments.

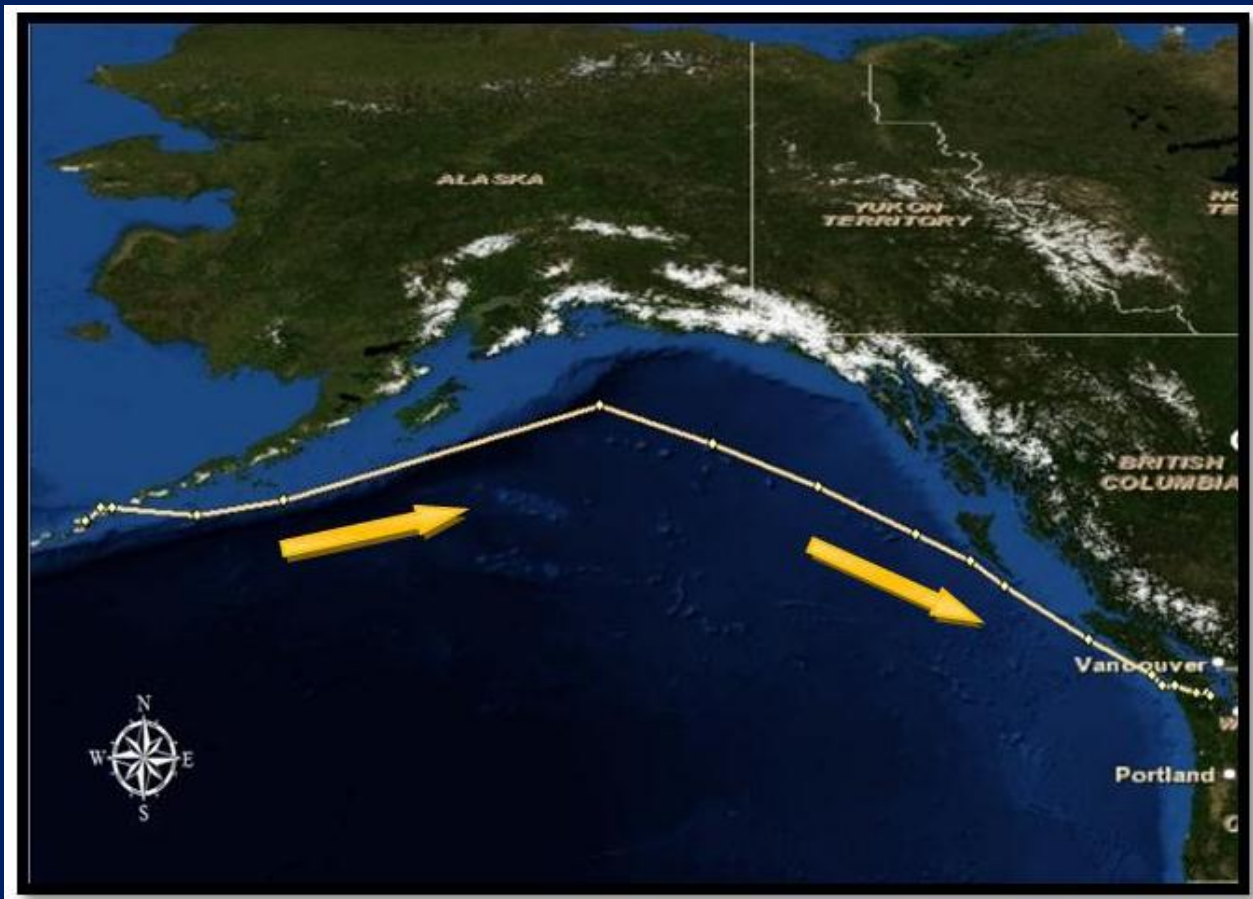
2. I am most troubled by the significant number and nature of the potential violations of law and regulations identified in the Enforcement section of the investigative report, including the failure to report marine casualties, failure to report safety-related vessel issues, and improper/illegal bridge and engineroom watch-keeping systems [Civil Penalty Finding 1, page 116]. I am additionally troubled by the potential evidence of negligent conduct by master, chief engineer, and third mate aboard the anchor-handling Offshore Supply Vessel M/V AIVIQ [Suspension and Revocation Findings 1-4, pages 116-117]. I will ensure that these potential violations are thoroughly investigated by the Officer in Charge, Marine Inspection, Western Alaska, and as applicable, at other Coast Guard Sectors. If an operator fails to notify class, the Coast Guard, and other stakeholders of casualties and/or hazardous conditions as required, there is a high probability appropriate risk mitigation actions will not be taken, and in the case of the KULLUK, with great consequence. If it is found that violations of law and regulations occurred in a company with a valid Safety Management System in place, it is of special concern. A Safety

-- Rear Admiral Servideo
Assistant Commandant for Prevention Policy
United States Coast Guard



21 December 2012

- Aiviq and Kulluk depart Dutch Harbor, Alaska





Kulluk

Flag: Republic of the Marshall Islands

Service: Mobile Offshore Drilling Unit (MODU)

Official Number: 802785

Year Built: 1979

Builder: Mitsui

Gross Tonnage, Inter. Tonnage Certificate: 27,968

Length (ft): 265.7

Breadth: Vessel is conical in shape

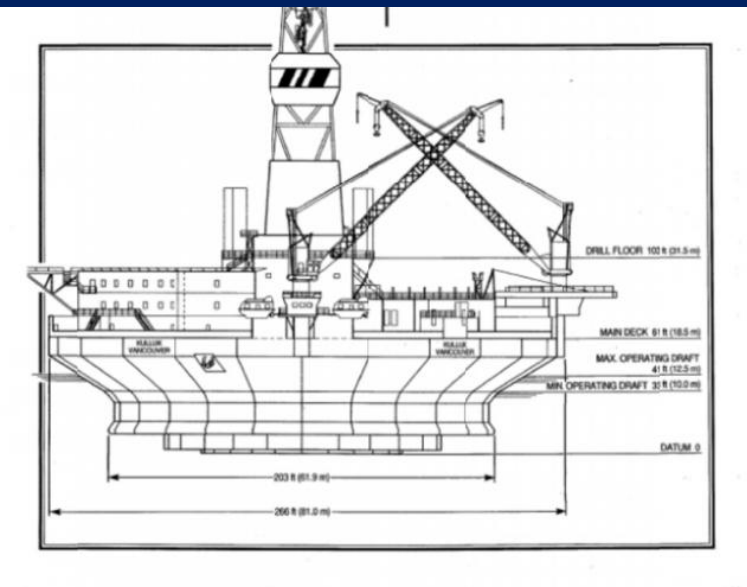
Draft: 10.7 meters at time of sailing

Propulsion: None

Manning Under Tow: 18

Owner: Shell Offshore, Inc.

Operator: Noble Drilling (US) LLC.





Aiviq



Flag: United States

Service: Offshore Supply Vessel

Official Number: 1237683

Year Built: 2012

Builder: North American Shipbuilding LLC

Gross Tonnage ITC: 12,892

Length (ft): 324.5

Breadth (ft): 80

Draft (ft): 28

Propulsion:

(4) Caterpillar Diesel Engines

(1) 2,800 hp Azimuth Thruster

Tunnel thrusters, (2) fore and (2) aft

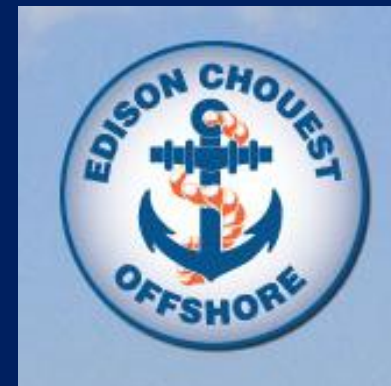
Total Shaft Horsepower: 21,776

Bollard Pull (Tons): 208

Crew: 18 Crew, plus Mooring Crew & Medic

Owner: Offshore Service Vessels, Inc.

Operator: Galliano Marine Services, LLC.





25 December 2012

- Weather deteriorates.

PKZ132-260300-

SHUYAK ISLAND TO SITKINAK

400 AM AKST **TUE DEC 25 2012**

...GALE WARNING TONIGHT AND WEDNESDAY...

.TODAY...W WIND 15 KT BECOMING S IN THE AFTERNOON. SEAS 11 FT.

.TONIGHT...SE WIND 20 KT BECOMING E 35 KT AFTER MIDNIGHT. SEAS
12 FT. RAIN.

.WED...SE WIND 40 KT. SEAS 15 FT. RAIN AND SNOW.

.WED NIGHT...SE WIND 30 KT. SEAS 16 FT.

.THU...S WIND 30 KT. SEAS BUILDING TO 21 FT.

.FRI THROUGH SAT...SE WIND 30 KT. SEAS SUBSIDING TO 14 FT.

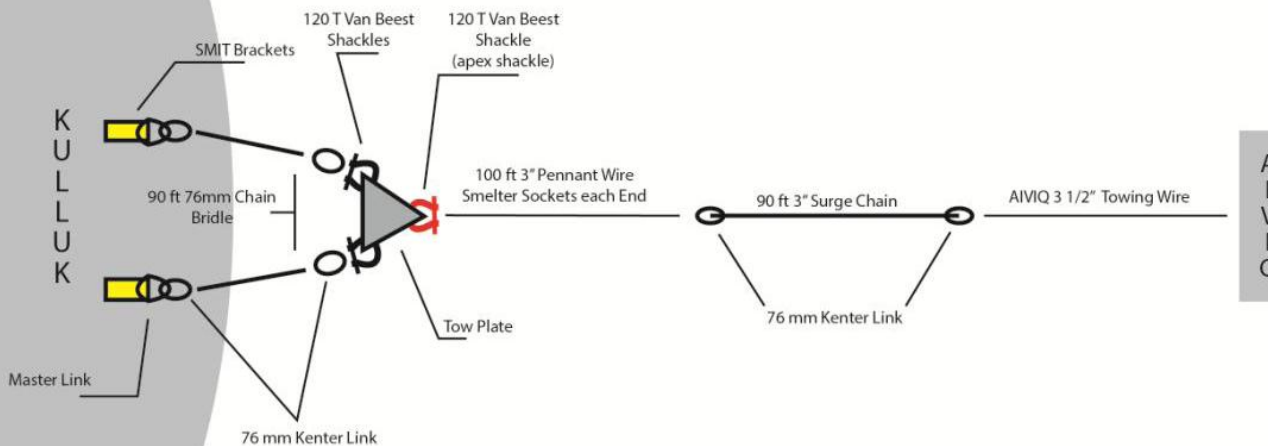


Sequential video captures from the CCTV taken aboard the AIVIQ with the starboard aft CCTV camera showing the fluctuations in the tension on the "Deadman" or "Hogging Chain" which is highlighted by a white oval shape. These captures were taken from AIVIQ CCTV footage after daylight on December 27, 2012. (CCTV Provided by ECO with USCG analysis)



27 December 2012

- Aiviq's tow connection parts
- The Kulluk drifts before an emergency tow line is established
- Guardsman and Nanuq dispatched toward Kulluk
- Aiviq loses all four main engines





28 December 2012



- USCG Alex Haley arrives on scene; prop fouled while attempting to establish tow.
- Aiviq gets 1 of 4 engines online
- Coast Guard Sector Anchorage, State of Alaska, Royal Dutch Shell and Edison Chouest Offshore establish a unified command in response to the Kulluk Tow Incident; Eventually more than 700 responders participate.
- Guardsman establishes tow with Aiviq (towing Kulluk)
- Kulluk drops anchor without telling Aiviq and Guardsman
- A Coast Guard helicopter attempt to rescue the 18 Kulluk crewmembers is unsuccessful due to exceptionally hazardous conditions



29 December 2012

- Towline between Guardsman and Aiviq parts
- Coast Guard helicopters deliver parts to Aiviq
- Aiviq brings 4 of 4 main engines online
- Nanuq and Aiviq both tow Kulluk; Nanuq uses the rig's mooring wire for a towrope
- Coast Guard Air Station Kodiak crews evacuate 18 Kulluk crewmembers
- Crews face hurricane weather conditions





30 December 2012



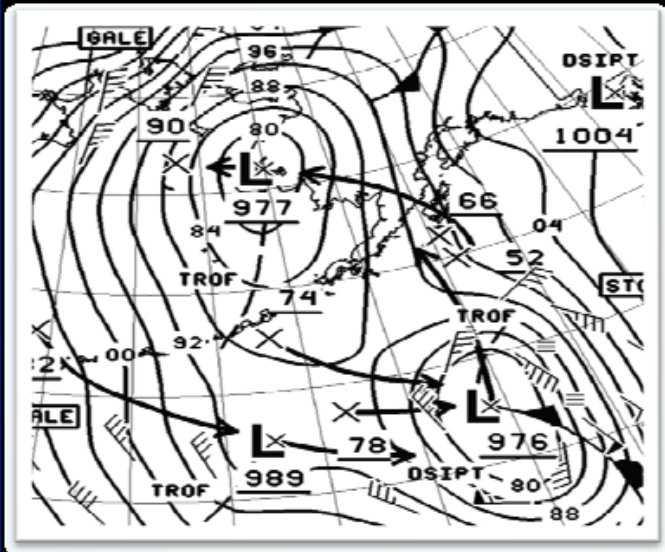
- Nanuq and Aiviq towlines part
- Alert establishes tow with Kulluk
- Aiviq reestablishes tow with Kulluk and tows in tandem with Alert
- USCGC Alex Haley returns to the scene
- Crews continue to battle deteriorating weather conditions





31 December 2012

- D17 Incident Management Team activated to support ICP
- Strong winds and rough seas continue to impact tow efforts
- Aiviq towline parts, leaving Alert alone towing Kulluk
- Alert follows Unified Command direction to release tow line to Kulluk to protect Alert and crew from possible grounding
- Kulluk grounds on the southeast side of Sitkalidak Island, Alaska





1 January 2013

- RADM Ostebo, CG 17th District commander, is the first senior federal official to fly over the grounded Kulluk
- Senator Lisa Murkowski (R-Alaska), visits the ICP to discuss priorities, and witnesses Unified Command response efforts





2 January 2013

- Air Station Kodiak crews transport salvage team to Kulluk
- Emergency towing system is delivered to Kulluk
- UC members fly over grounded Kulluk to better assess situation





3 to 5 January 2013

- Air Station Kodiak crews continue over flights and transfer of salvage team members and equipment to Kulluk
- Kulluk reported to be intact and no reports of oil in the water
- Coast Guard Cutter Alex Haley remains on scene
- Coast Guard, Shell, and state representatives attend Kodiak Borough Assembly meeting to discuss Kulluk response
- U.S. Army CH-47 helicopters assist with equipment deliveries
- Kulluk assessment ongoing and preps for removal continue
- Weather begins to improve





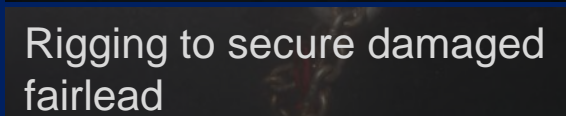
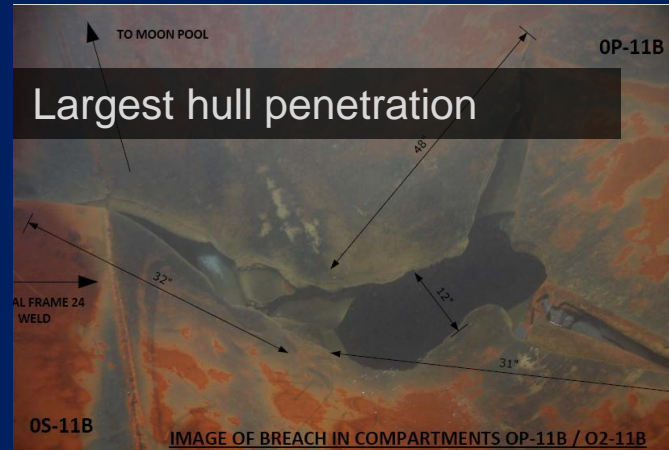
6 to 7 January 2013

- Aiviq reconnects tow with Kulluk, attempt to refloat Kulluk successful
- Aiviq begins towing Kulluk to Kiliuda Bay
- Aiviq crew completes tow of Kulluk to Kiliuda Bay
- Kulluk anchored in safe harbor for assessment and repairs, Coast Guard continues to monitor situation and engage with other Unified Command members





Kulluk's Exterior Damage





Kulluk's Interior Damage

Flooded compartment



Typical interior damage



Stateroom



Mess Deck



Flooded Compartment





Kulluk

- USCG Certificate of Compliance revoked on January 18th
- Handed over to USCG Activities Far East/MIDET for repair oversight
- Has not yet returned to US waters (and is likely destined for scrap)



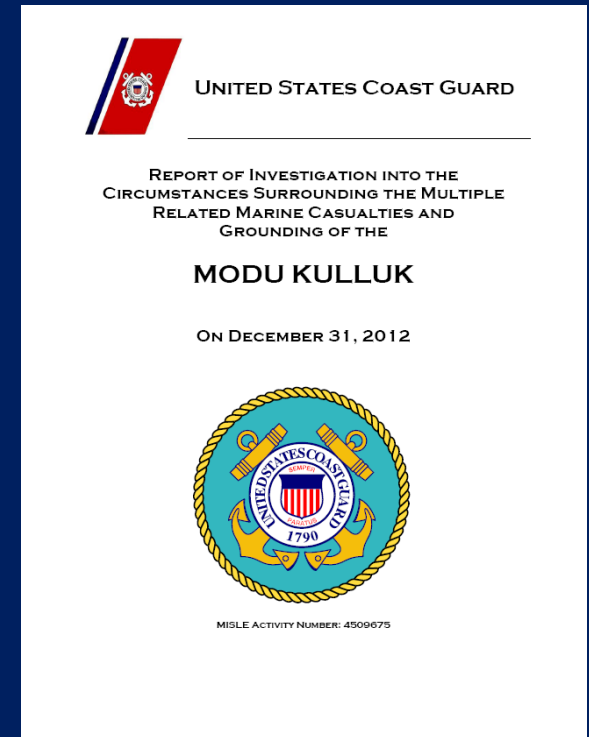


Investigation

D17 RADM Ostebo orders a formal marine casualty investigation



Marine Board Hearings
In Anchorage May 2013



Report of Investigation
Finalized April 2014



ROI Conclusions – Tow

- Shell's tow plan oversight was inadequate and did not include any formal risk assessment
- Reliance on a single towing vessel was a risk
- The close-to-shore route taken was not the most direct route and did not allow much room for error after control was lost
- The Aiviq had known mechanical issues prior to the tow which had not been communicated to the Classification Society or the Coast Guard
- Response vessels were not pre-identified by Shell, and those that did respond were undersized
- Heavy weather complicated connections of emergency tows



ROI Conclusions - Tow (continued)

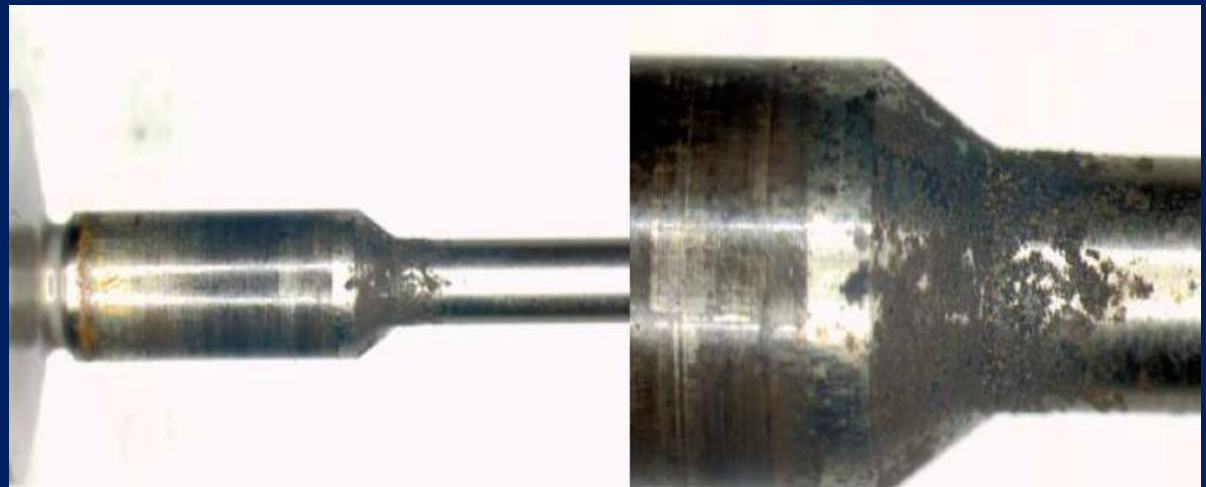


- Bad weather & Kulluk's unique conical hull design made this tow unusually challenging
- Aiviq bridge crew had little experience towing in AK
- Master did not set clear towing parameters for officers to monitor, underutilizing sophisticated tow monitoring equipment
- Company did not provide towing procedures
- Shackle was undersized for the job
- Tow gear was not thoroughly examined prior to voyage
- Length of surge chain was insufficient for shock dampening



Conclusions – Aiviq Propulsion

- Extensive corrosion was found in main engine and generator fuel injectors after the casualty
- Vessel design problems allowed seawater to enter through vents and contaminate the fuel system in heavy weather
- The crew had altered the approved configuration of the fuel system, inadvertently eliminating protective redundancies
- The company did not provide adequate fuel management policies and procedures





Recommendations

- Companies should develop and maintain robust policies addressing all aspects of marine operations, including tow planning, everywhere in the world, but specifically in Alaska and other areas prone to heavy weather. Vessel-specific tow policies and guidance should be integral to Safety Management Systems.
- The Coast Guard should partner with the Towing Safety Advisory Council (TSAC) to establish a working group to draft and accept a Task Statement on towage of MODUs in the arctic marine environment.
- The Coast Guard should reevaluate the adequacy of emergency towing equipment and practices on its cutters.
-
- Edison Chouest Offshore should develop and implement towing and fuel management procedures for Aiviq, formalize training requirements for officers involved in towing, and correct design issues on Aiviq.



Enforcements

Sector Anchorage is considering appropriate enforcement actions:

- Potential civil penalties for Edison Chouest Offshore for failures to report Marine Casualties to the Coast Guard during the 2012 drilling season
- Potential suspension of merchant mariner credentials held by Aiviq's officers for negligence and violations of regulation.



Next



- Sector Anchorage's investigation into Aiviq casualties before & after Kulluk grounding continues
- The Coast Guard continues to closely scrutinize Aiviq's fuel systems & safety management practices through intensified inspections oversight
- Lessons learned & recommendations will impact current & future energy industry operations in AK



