İSTANBUL VE MARMARA, EGE, AKDENİZ, KARADENİZ BÖLGELERİ
DENİZ TİCARET ODASI
ISTANBUL & MARMARA, AEGEAN, MEDITERRANEAN, BLACKSEA REGIONS
CHAMBER OF SHIPPING

İstanbul :

03.08.2015

Sayı
Our Reference : 3215

Konu
Subject : **MAIB Güvenlik Bülteni – MV ZARGA Gemisinde Manevrada Meydana Gelen Ciddi Yaralanma Hk.**

Sirküler No: 592/ 2015

Sayın Üyemiz,

İlgi: Uluslararası Deniz Ticaret Odası'ndan (ICS) alınan 23.07.2015 tarih ve MC(15)39 sayılı yazı.

İlgi yazıda, İngiltere Deniz Kazalarını Araştırma Bürosu'nun (Marine Accident Investigation Branch -MAIB), "M/V Zarga" gemisinin yanaşma manevrası esnasında, baş taraftaki görevli güverte zabitinin, halat kopması sonucu meydana gelen kamçı etkisiyle ciddi bir şekilde başından yaralanmasını konu alan kaza raporu ve olayın meydana gelmemesi için alınması gereken tedbirlere ilişkin bilgilere yer verilmektedir. İlgi yazı Güvenlik Bülteninin Odamızda yapılan özet Türkçe çevirisi (Ek-1) ile ilgi yazı ve Eki MAIB Raporu (Ek-2) ilişikte sunulmaktadır.

Bilgilerinizi arz ve rica ederiz.

Saygılarımızla,

Murat TUNCER
Genel Sekreter

EKLER:
Ek-1: İlgi yazı Ekinin Özet Türkçe çevirisi.
Ek-2: İlgi yazı ve Eki MAIB Güvenlik Bülteni.

DAĞITIM:

Gereği:
- Tüm Üyelerimiz (WEB)
-Türk Armatörler Birliği
-S/S Gemi Armatörleri ve Motorlu Taş. Koop.
- UND
- RODER
- KOSDER
- ROFED
- S.S. Deniz Tankerleri Akaryakıt Taş. Koop.
- Türk Uzakyol Gemi Kaptanları Derneği
- 15,16,17,18,19,20, 21, 22 23, 24, 25, 27,28 29,30 Meslek Komitesi Başkanları
- Tüm Gemi Sahipleri

Bilgi:
- YK Başkan ve Üyeleri
- Piri Reis Üniversitesi

EK -1
MAIB (Deniz Kazalarını Araştırma Bürosu)

GÜVENLİK BÜLTENİ

DENİZ KAZALARI İNCELEME BÖLÜMÜ

SB1/2015 Temmuz 2015

Gemide Palamar Halatı Kopması Sonucu Güverte Zaibiti'nin Yaralanması

Zarga

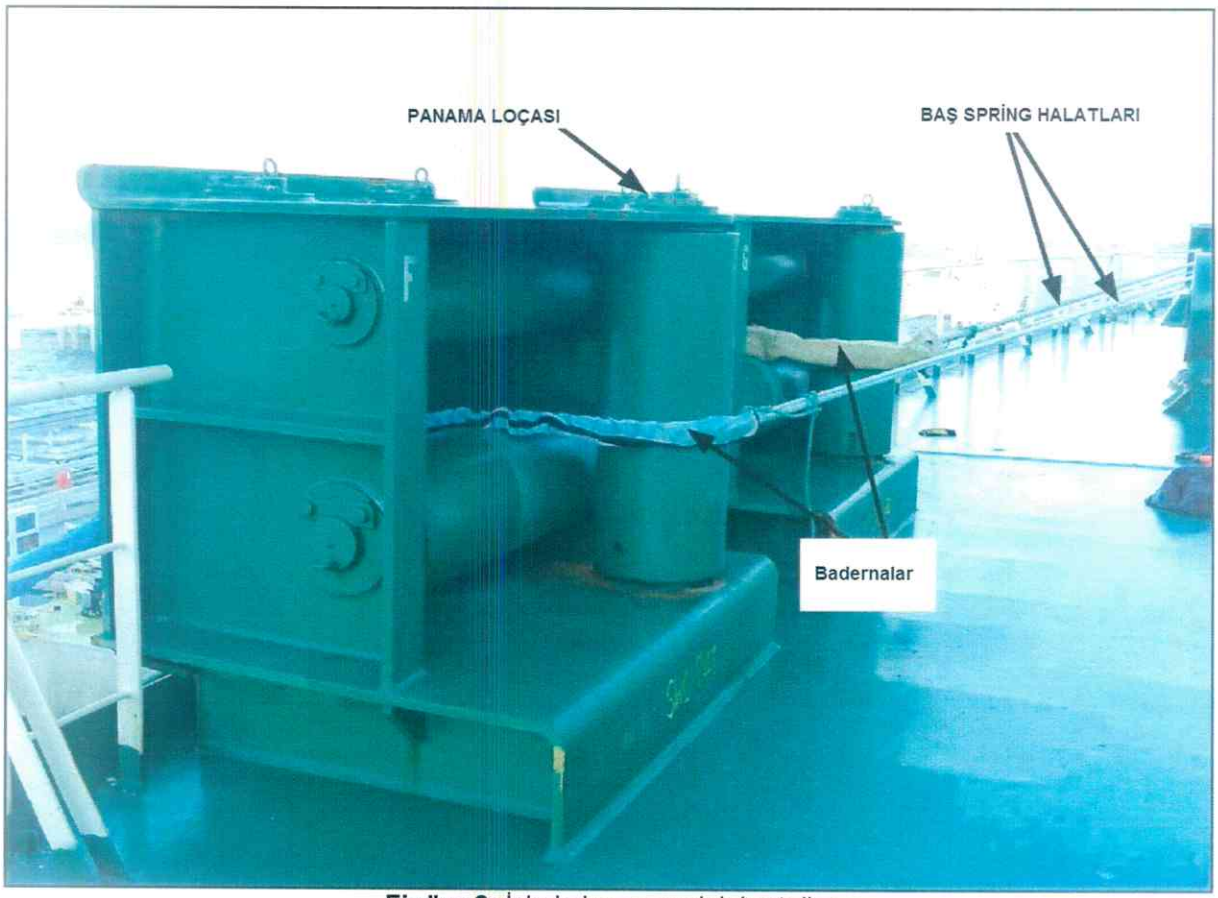
2 Mart 2015 Güney Hook LNG Terminali , Milford Haven

Olayın Arka Planı

Zarga (Figür 1) isimli LNG Tankerinin güverte zabiti, Güney Hook LNG, Milford terminaline yanaşma esnasında, kopan bir halatın başına çarpması sonucu yaralanmıştır Baş tarafta yanaşma manevrasından sorumlu olan zabit, helikopterle gemiden alınarak acil ameliyat için sağlık kuruluşuna nakledilmiştir.

Zarga gemisi kazanın meydana gelmesinden 40 dakika önce, geminin tüm halatlarla rıhtıma bağlandığını rapor ederek bağlı römorkörü mola etmiştir. Sonrasında esen güçlü rüzgar neticesinde gemi rıhtımdan açmaya başlamıştır. Mürettebat bu esnada halatlara [1]badernaları yerleştirmektedir **(Figür 2).** Römorkörler halihazırda mola edilmişken (hemen geri çağırılması gerekirken), rıhtımdan açan Zara gemisini tekrar yanaştırmak için gemi kaptanı, baş taraf manevrasından sorumlu güverte zabitine baş spring halatını vira etmesi direktifini vermiştir.

Sorumlu Vardiya Zabiti, iskele baş omuzluktaki (panama halat loçası) kurtağzındaki baş sprink halatının arkasına geçmiş,**(Figür 2 ve 3)** diğer mürettebat ise sorumlu güverte zabitinden aldığı komutları halat vinçi operatörüne iletmek için onun ilerisinde pozisyon almıştır. Vinç operatörü baş spring halatını vira etmek için teşebbüste bulunduğunda aşırı yükten dolayı defalarca halat kaçırmış ve durmuştur. Yaklaşık olarak 10 dakika kadar sonra halatın çatırdamaya başladığı duyulmuş ve akabinde halat aniden kopmuştur. Halatın kopmasıyla, baş omuzluktaki kurtağzından halatın kopan kısmına kadar olan tarafı kırbaç etkisi yaratarak Görevli Güverte Zabitinin başına çarpmış ve kurtağzından geri denize düşmüştür.



Figüre 2: İskele baş omuzluk kurtağzı

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[1]Baderna: Halatın aşınabilecek yerine sarılan bez, halat sargısı

Figür 3: Baş taraf manevra ekibi Sorumlu Güverte Zabiti, iskele baş omuzluk panama loçası yakınında resimdeki gibi pozisyon almıştır.

OLAYDAN ÇIKARILAN DERSLER

- Ultra yüksek moleküler ağırlıklı polietilen halat ve çelik halatlara eklenen sentetik halatların elastiki oluşlarından dolayı halat kırbaç etkisini muazzam bir şekilde arttıracağı bilinmelidir.

- Halatın uzama payı halatın uzunluğu ile bağlantılıdır. Kamçı halatının uzunluğu esneme payını artıracak aynı zamanda ağır yük altındaki bir halatın üzerindeki gerilimi yükseltecektir.

- Armatör / İşletmeci kullanılan halatların amacına uygun yerlerde kullanılacağından emin olmalı, halatın kopma sonucu oluşturacağı kamçı etkisinin tehlikeli olduğu daima dikkate alınmalıdır.

- Manevra gerçekleştiren mürettebat farklı yapı ve çeşitlerdeki halatların kopması sonucu yaratacağı kamçı etkisine karşı tedbirli ve uyanık olmalı, üzerinde yük olan halatların her zaman tehlikeli olduğu akıldan çıkarılmamalıdır.

- İşletmeci ve Gemi Kaptanı, kendi gemilerinde kamçı etkisi yaratacak riskli bölgeleri belirleyerek gerekli tedbirleri almalı ve personelinin bu konuda düzenli aralıklarla bilgilendirilmesini sağlamalıdır.

- Zarga gemisinin baş spring halatının kopması ile ilgili inceleme ve soruşturmanın devam ediyor olmasına bakılmaksızın söz konusu halatın kullanılmasına devam edilmesinden şüphe edildiği takdirde İşletmeci detaylı bir inceleme için halatın üreticisinden bilgi talep etmelidir.

- Rıhtımdan geminin açmasına sebep olabilecek kuvvetli rüzgar estiği durumlarda ekstra halatlar verilmeli, tek bir halata kumanda ederek gemi rıhtıma yanaştırılmaya çalışılmamalı, geminin kendi imkanlarıyla rıhtımdan açması engellenemiyorsa römorkör desteği istenmelidir.

ER-2

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

SAFETY BULLETIN

SB1/2015 July 2015

Extracts from The United Kingdom Merchant Shipping (Accident Reporting and Investigation) Regulations 2012

Regulation 5:
"The sole objective of a safety investigation into an accident under these Regulations shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of such an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame."

Regulation 16(1):
"The Chief Inspector may at any time make recommendations as to how future accidents may be prevented."

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Public Enquiries:
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NOTE

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Email: maib@dft.gsi.gov.uk
Tel: 023 8039 5500
Fax: 023 8023 2459

Mooring line failure resulting in serious injury to a deck officer on board *Zarga* alongside South Hook LNG terminal, Milford Haven on 2 March 2015

Figure 1: *Zarga* alongside South Hook LNG terminal

MAIB SAFETY BULLETIN 1/2015

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The Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 provide for the Chief Inspector of Marine Accidents to make recommendations at any time during the course of an investigation if, in his opinion, it is necessary or desirable to do so.

In co-operation with the Republic of the Marshall Islands, the Marine Accident Investigation Branch (MAIB) is carrying out an investigation into a mooring line failure, resulting in the serious injury to a deck officer on board the Marshall Islands flagged Liquefied Natural Gas (LNG) carrier *Zarga* at the South Hook LNG terminal, Milford Haven on 2 March 2015.

The MAIB will publish a full report on completion of the investigation.

Steve Clinch.

Steve Clinch

Chief Inspector of Marine Accidents

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BACKGROUND

On 2 March 2015, a deck officer on board the LNG tanker, *Zarga* **(Figure 1)**, suffered severe head injuries when he was struck by a mooring line that parted during a berthing operation at the South Hook LNG terminal, Milford Haven. The officer, who was in charge of the vessel's forward mooring party, was airlifted to a specialist head injuries trauma unit for emergency surgery.

Zarga was declared *all fast* alongside about 40 minutes prior to the accident and the attending tugs were let go. The vessel subsequently moved out of position in the gusty wind conditions during which time the mooring teams were fitting chafing guards to the lines **(Figure 2)**. As the tugs had already been released, the master instructed the officer in charge (OIC) of the forward mooring party to tension the forward spring lines to warp *Zarga* back into the correct position.

The OIC positioned himself aft of the forward springs' port-shoulder roller fairlead **(Figures 2** and **3)**, and positioned a second crewman forward of him in order to relay his orders to the winch operator. As the winch operator attempted to heave in on the springs, the winch repeatedly stalled and rendered[1]. After about 10 minutes, one of the spring lines began to rattle and creak, and then suddenly parted **(Figure 4)**. The section of the line between the break and the port-shoulder roller fairlead struck the OIC on his head as it whipped back before going overboard through the fairlead.

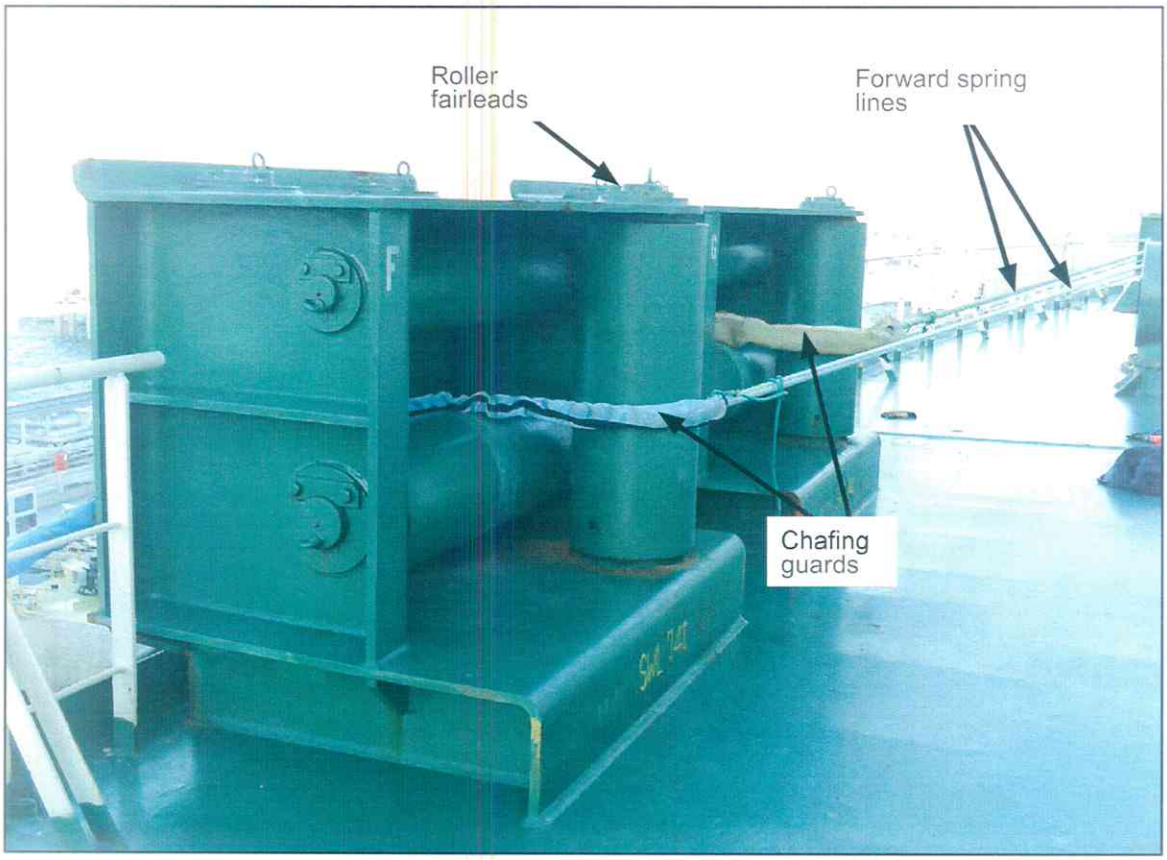

Figure 2: Port-shoulder roller fairlead

[1] Slipping under load

MOORING LINES AND WINCHES

The 5-year old mooring lines fitted to the vessel were 44mm diameter sheathed ultra-high modulus polyethylene (UHMPE) with a length of 275m and a minimum breaking load (MBL) when new of 137t. The outboard ends of the UHMPE spring lines were fitted with 22m long Euroflex (polyester/polyolefin) tails, which had an MBL of 190t. The section of the UHMPE spring line in use between the winch and the connection with the Euroflex tail was about 68m long. The split drum type mooring winch had a 30.6 tonne-force (tf) winding pull, rendered at a load of 34tf and operated at 15m/minute.

INITIAL FINDINGS

Elongation and snap-back

The amount a mooring line stretches depends on the elasticity of the material(s) used in its manufacture and the length under load. Elongation of the line introduces stored energy that, if suddenly released under load when the line parts, can cause the failed ends to recoil back towards their anchor points at high speed; this is referred to as snap-back.

Both wire and high modulus synthetic mooring lines have low elasticity and, consequently, are considered to have very little snap-back when they fail, and this is often considered to be an advantage over other types of synthetic line. However, although capable of handling high dynamic loads, low elasticity can make high modulus synthetic mooring lines prone to failure under peak dynamic loading.

On board *Zarga*, 11m tails were originally fitted to reduce peak dynamic loading, but these were replaced with 22m tails after peak dynamic loads were experienced that had led to a series of line failures. However, the 22m tails had much greater elasticity and this, and the routeing of the line, introduced a significant snap-back hazard to the outer section of the failed UHMPE mooring line. The danger of snap-back was identified in the vessel's risk assessments, but snap-back zones had not been marked on *Zarga*'s mooring decks. Because UHMPE mooring lines were fitted, the perception among members of the crew was that, in the event of a mooring line failure under load, the ends of a parted line would simply fall to the deck. In this case, the inboard section of the failed line recoiled a short distance towards the base of the winch.

Post-accident tests

Following the accident, the MAIB commissioned a series of tests and trials designed to measure the elongation and snap-back characteristics of the mooring lines used on board *Zarga*. When sections of the UHMPE rope were loaded to the point of failure the average maximum elongation was about 2% and minimal snap-back was observed. When the trial was repeated with the Euroflex tail[2] attached the elongation was significantly increased. Similar to the accident, it was the UHMPE section of the line that parted, and the failed end that was attached to the tail snapped back over 15m in less than 1 second. The other end of the UHMPE rope did not snap back.

Short video clips of these trials can be found on the MAIB website at https://www.gov.uk/maib-reports/safety-warning-issued-after-mooring-line-failure-on-board-lng-tanker-zarga-resulted-in-serious-injury-to-a-deck-officer.

The causes and contributing factors of *Zarga*'s mooring line failure are subject to an ongoing investigation and will be discussed in a full investigation report.

[2] The 22m tail was shortened to 15m to allow it to be accommodated within the test machine

Figure 3: Forward mooring party OIC at port-shoulder roller fairlead

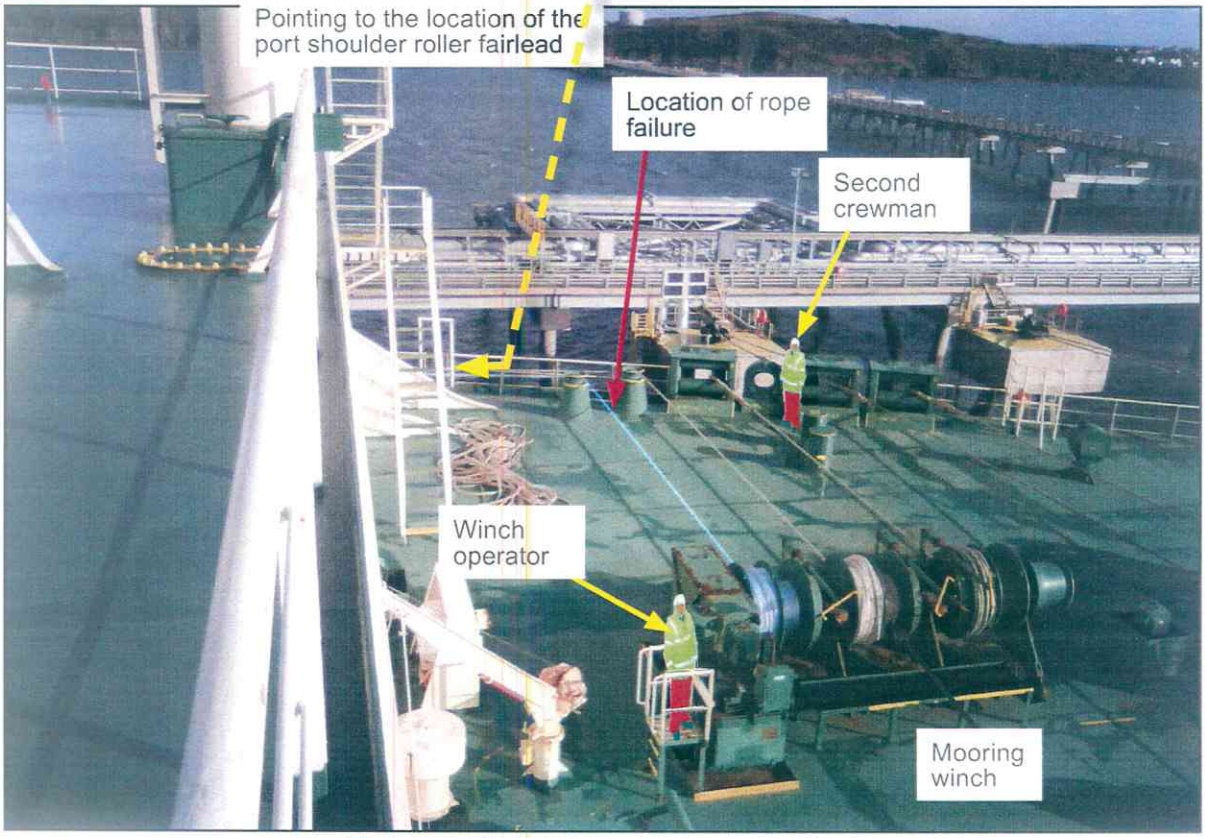

Figure 4: Port side forward mooring deck

SAFETY LESSONS

- When connecting synthetic tails to UHMPE, HMPE and wire mooring lines, the energy introduced due to the elasticity of the tails can significantly increase the snap-back hazard.
- Elongation is proportional to the length of tail. Increasing the length of the tail will increase the amount of elongation and hence the amount of energy that can be stored in the line when under load.
- Ship owners/operators should ensure that the type of lines and tails used for mooring lines are suitable for the task and that the dangers of snap-back are fully considered.
- Mooring teams should be aware of the potential for snap-back in all types of mooring line, and the probable areas on the mooring deck that are not safe when lines are under load.
- Mooring lines led around roller pedestals and fairleads can lead to potentially complex snap-back zones. Ship operators and masters should conduct their own risk assessments to ensure potential snap-back zones are identified, and are reviewed at regular intervals.
- Notwithstanding the ongoing investigation into the nature of the failure of *Zarga*'s spring line, where doubt exists on the continued use of a mooring line, the vessel operator should obtain guidance from the rope manufacturer on the conduct of detailed line inspections.

Issued July 2015

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

SAFETY BULLETIN

SB1/2015 July 2015

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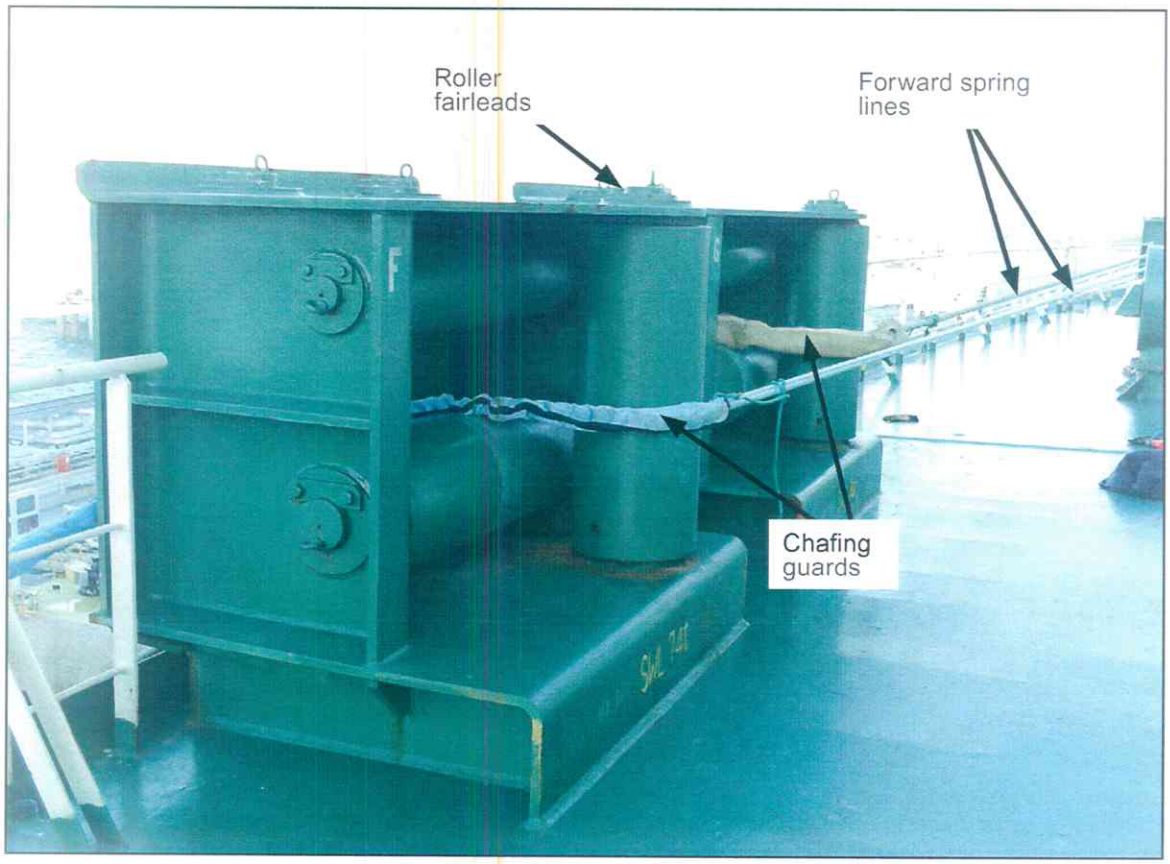

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