Annex A

Maersk Newport's Heavy Weather Casualty Report dated 11 November 2008

MAERSK

Casualty Report

A.P.Moller Group ID:039 - 06/07/04 - 00 - Retain

No.: **870/2008/001**

Vessel: **Maersk Newport**

A Copy has been sent / given to:

TOOPSCONC ☐

☐

☐

☐

Time/Place of accident (or en-route from/to): **En route Le Harve to Algeciras**					
Nature of Casualty: **Hull damage to port side for'd**				Name of Pilot:	
Tugs(s) (Name(s)):				Draft: Fore: **9.70** Aft: **10.70**	
Course: **240**	Speed: **15**	Current:	Sea: **Rough**	Wind:	**WSW8/9**

Details of Damage to own vessel/cargo:

Please see content of earlier messages alreaty sent to Technical Organisation.

Vessel in heavy weather since leaving Le Harve FAOP 10/0118.

Today at lunchtime a number of bow thruster alarms and fire alarms showed from bow thruster space.

On investigation it was found that a lot of water was entering the bow thruster space, further investigation showed three split holes on the port side dimensions approx 150 X 250mm.

Presently adjusting trim and pumping out bow thruster space bilge.

Leakage has been reduced temporarily by wooden plugs and flow reduced.

We suspect port anchor has broken free causing the damage but unable to verify at present due to weather. Will investigate this before dark and report.

Vessel is now proceeding at slow ahead at moment to allow ballast adjustments and further investigation.

Unable to communicate with you by Sat phone at present time because phone is locked up.

(Next Message)
Further to our earlier message as below - here are the subsequent findings.

Vessel was brought around to allow examination of the general bow area and found the following.

The port anchor lashings were discovered to be loose and the for'd guillotine bar was up and aft bar was down. The friction brake was found to be on fully tight position.

The port anchor cable was found paid out to about a half to three quarters shackle length.

There is considerable impact point damage to the port outer hull in region of bow thrust room fore peak and void space above fore peak.

Due to the ingress of water into the bow thruster space we believe all the electrical installations in that space have been damaged, including emergency fire pump, bow thruster motor and its ancillary equipment.

Anchor has been recovered and secured. Further investigations are continuing. Will keep you informed.

(Next message)
Please find attached photos of visible damage.

MAERSK

Casualty Report

A.P.Moller Group ID:039 - 06/07/04 - 00 - Retain

Please note, picture of bow thruster space shows the present water level after pumping throughout the night. Now weather has calmed will check later to see if level is falling. Picture also show our attempts to reduce leakage.

The tanks that we know are holed are R001-Fore Peak; R003-Void space (above fore peak); R021 - Ballast tank. R023 - Cargo hold bilge tank has also filled, suspect this tank is also holed.

Please note photos already forwarded to Technical Organisation

Party held responsible (copy of Notice to be enclosed):	Survey made:
Affirmative. by whom:	

Details of damage to other parties' property:

Has the vessel been held responsible (copy of Notice to be enclosed):	Survey made:
Affirmative, by whom:	

Description of accident including cause:

During heavy weather the port anchor f shackle length causing extensive point impact damage to port fore tanks as follows:

Bow thruster space
R001- Fore peak
R003- Void space above fore peak
R021- Ballast tank center
R023- Cargo hold bilge tank
all between frame numbers 215 and 245

Master: **11-Nov-2008**

Chief Engineer: **11-Nov-2008**

Signature (Chief Engineer)

Annex B

Technical superintendent’s e-mail request for berths dated 11 November 2008

www.maerskline.com

For matters AOH, please contact staff on duty at phones;
- Office
- Mobil

From:
Sent: Tuesday, November 11, 2008 2:02 PM
To: ALRAGY
Cc: Maersk Newport (Line); WOCAFROPS
Subject: Maersk Newport - Layby berth

Good day

Our Maersk Newport will arrive to ALR the 13-11-2008 at 0400 hours and cargo operation will start the 14-11-2008 at 2000 hours. As vessel have some damaged there need to be repaired before leaving ALR, we will need a layby berth on arrival the 13-11-2008 and until cargo operation. All depending of the findings we might also need the layby berth after cargo operation. Company there will perform the repair will be "Servyman"

Please confirm above and also inform which layby berth there will be arranged. Further can inform that we might also need a mobil crane.

Yours faithfully
for A.P. MOLLER

Technical Vessel Operation Container
Maersk Line

A. P. Moller - Maersk A/S
Esplanaden 50
1098 Copenhagen K
Denmark
Reg No: 22756214
Phone:
http://www.maerskline.com

This e-mail is intended exclusively for the addressee. If you are not the addressee you must not read, copy, use or disclose the e-mail nor the content; please notify us immediately [by clicking 'Reply'] and delete this e-mail.

Annex C

Maersk agent’s translated proforma request for approval of hot work

REQUEST FOR REPAIRS (MAERSK NEWPORT 0807)

TO: THE PORT OF ALGECIRAS BAY AUTHORITY
CC: ALGECIRAS MARITIME AUTHORITIES
FM: MAERSK SPAIN, S.L.U. (AGENCY)

REQUEST FOR REPAIRS TO THE SHIP: MAERSK NEWPORT

WE HEREBY REQUEST AUTHORISATION TO CARRY OUT REPAIRS TO THE ABOVE VESSEL.

A) APPLICANT: MAERSK SPAIN, S.L.U. (AGENCY)

B) CONSIGNEE: MAERSK SPAIN, S.L.U. (AGENCY) – TAX REF. B-85173821

C) SHIPOWNER/OPERATOR: THE MAERSK CO. LTD LONDON-COPENHAGEN

D) BERTHING/ANCHORAGE AREA: JUAN CARLOS I ESTE

E) SHIP NAME: MAERSK NEWPORT
FLAG: UNITED KINGDOM/GB
IMO NUMBER: 9356127

F) SHIP TYPE: CONTAINER

G) SHIP DETAILS: DWT: 35100 GT: 25888
LOA: 210.54 BREADTH: 29.80

H) CARGO: YES
TYPE OF CARGO: GENERAL GOODS IN CONTAINERS
QUANTITY OF CARGO: N/A
TYPE OF GOODS: GENERAL GOODS IN CONTAINERS
HAZARDOUS: N/A

I) WORK TO BE CARRIED OUT: RENOVATION OF HULL BODY IN BOW AREA
ESTIMATED LENGTH OF TIME: 72 HOURS
DESCRIPTION OF THE WORK:

* RENOVATION OF HULL BODY IN BOW AREA

HOT OR COLD WORK: HOT

J) NAME OF THE PERSON RESPONSIBLE:
REPAIR WORKSHOP: SERVYMAN DEL ESTRECHO
SERVYMAN: 648186430

K) SAFETY MEASURES: SHIP'S OWN

---Electronic message without signature---
Maersk Spain, S.L. acting as general agent of Maersk Line in Spain
Sender: Jesus Maestre Web: www.maerskline.com
Phone: +34 956671834 Fax: +34 901100098 E-mail: alragy@maersk.com

ON BOARD:

L) SUBCONTRACT: NO

M) NAME OF THE SUBCONTRACTOR: N/A

PLEASE MAKE SURE THAT AUTHORISATION IS OBTAINED FOR THE REPAIRS MENTIONED ON THIS FORM.

BEST WISHES
MAERSK SPAIN, S.L.U. (AGENCY)
TRAFFIC DEPARTMENT

Annex D

Algeciras Port Authority’s translated approval to carry out hot work

MINISTERIO DE FOMENTO

ALGECIRAS N Reg.
Nº Doc: 200832013268 F Reg:
Nº Exp: 200832009629 Dest: 996/000
D.G.M.M

SECRETARÍA GENERAL DE TRANSPORTES
Dirección General de la Marina Mercante
Capitanía Marítima de Algeciras-La Línea.

ASUNTO: TRABAJOS EN CALIENTE BUQUE **"MAERSK NEWPORT"** OBRAS SOLICITADAS POR **MAERSK LINE.**

Por parte de esta Inspección Marítima NO EXISTE INCOVENIENTE TECNICO en acceder a lo solicitado en el asunto, siempre que se cumplan los procedimientos de Gestión del Buque (S.G.S.) con el control y supervisión del Capitán.

Debido a que los trabajos son en caliente les indicamos a continuación otros requisitos que si no están en el SGS del buque, deberán aplicarse complementariamente, salvo que el Capitán no lo considere oportuno, en cuyo caso deberá justificarlo previamente a esta Inspección para su confirmación y modificación.

Antes de proceder a efectuarlos, tanto en la zona de Cubierta como los Tanques donde se vaya a efectuar los trabajos, se realizará su limpieza de acuerdo con la última carga transportada por el Buque. Se adjuntará Certificado GASFREE en el que se estipule para ese producto su:

LIE

LSE

TLV

y el valor medido de explosividad en el momento del Reconocimiento, hallado por medio de explosímetro homologado que será inferior al 1% de su LIE.

Durante los trabajos en el Tanque:

* Las zonas de trabajo del tanque en todas sus caras, fondo y superficies adyacentes horizontales (palmejares, longitudinales, ...) estarán libres de residuos de hidrocarburos.

* La temperatura no provocará cansancio térmico.

* El Personal será el mínimo posible.

* La concentración de gases será inferior a su TLV.

* Se colocarán en las inmediaciones:

- Iluminación suficiente

- Equipos de Respiración Autónoma (ERA)

- Arneses de Seguridad

- VHF portátil de seguridad

* En el exterior habrá un vigilante permanente, con VHF.

* Se comprobarán periódicamente las condiciones atmosféricas del lugar de trabajo por medio de explosímetro.

* No se introducirán nunca en el Tanque Botellas ni equipos oxiacetilenicos.

* Se colocarán dos extintores portátiles de polvo seco en la boca del Tanque.

Dirección: Avda. de la Hispanidad.
Código Postal. 11207 ALGECIRAS
Teléfono 956.60.41.51
Fax 956.6058.89

MINISTERIO
DE FOMENTO

SECRETARÍA GENERAL
DE TRANSPORTES
Dirección General de la
Marina Mercante
Capitanía Marítima de
Algeciras-La Línea.

* El porcentaje de O2 en el Tanque será del 21 % durante toda la operación.

* Se evitará que al desmontar las válvulas se desprendan al tanque gases nocivos o explosivos, durante la realización de los trabajos, por medio de la colocación de bridas ciegas.

* Se proveerá ventilación forzada al interior del Tanque movida por el sistema C.I. desde las aberturas del Tanque en Cubierta Principal.

Caso de realizar trabajos en Cubierta Principal y en tuberías sobre ella, estas se cortarán una vez desgasificadas y llenas de agua. Las soldaduras en las tuberías así como en soportes a cubierta se realizarán en Gas Free para la tubería y para los espacios que quedan bajo ésta, así como sus adyacentes inmediatos.

Si se van a efectuar también trabajos en caliente en Cámara de Máquinas:

a) Los tubos de sonda de los tanques de combustible estarán completamente cerrados.

b) No se procederá a efectuar bunker hasta después de 3 horas de haber efectuado los trabajos.

c) La ventilación y extracción de Cámara de Máquinas estarán en funcionamiento permanente.

d) No se procederá a cortes, ni calentamiento de tuberías de combustible, ni en los aledaños de los tanques de combustible o sus bandejas de derrames.

e) En el lugar de los trabajos se mantendrán preparados dos extintores portátiles y manguera c.i. presurizada, con boquilla de niebla.

f) Se vigilarán e inspeccionarán las caras posteriores al lugar del trabajo.

Antes de proceder a la reparación deberá proveerse de CERTIFICADO GAS-FREE que se hace mención en el escrito. El buque permanecerá en GAS FREE durante la realización de los trabajos.

No se podrá efectuar aprovisionamiento de combustible simultáneamente a la realización de los trabajos.

Todos los operarios que vayan a intervenir en las reparaciones irán provistos de los EPI,s reglamentarios para cada trabajo a realizar.

Del presente escrito se hará entrega por parte de esa Empresa de una fotocopia al Capitán del Buque con anterioridad a la realización de los trabajos solicitados, así como a la Empresa encargada de la reparación.

Algeciras, 06 de Noviembre de 2008.
EL CAPITÁN MARITIMO
P.D.EL JEFE DE INSPECCIÓN.,

CAPITANÍA MARÍTIMA ALGECIRAS MINISTERIO DE FOMENTO

MAERSK LINE

ALGECIRAS N Reg:
Nº Doc: 200832013268 F Reg:
Nº Exp: 20083209629 Dest: 996/000
D.G.M.M

Dirección: Avda. de la Hispanidad.
Código Postal. 11207 ALGECIRAS
Teléfono 956.60.41.51
Fax 956.6058.89

SUBJECT: HOT WORKS ON THE SHIP **"MAERSK NEWPORT";** WORK REQUESTED BY **MAERSK LINE**.

This Maritime Inspectorate does not believe that there exists any **TECHNICAL PROBLEMS** in granting the above request, provided that the works are carried out in compliance with Ship Management Procedures (S.G.S.) and under the control and supervision of the Captain.

As these works are hot, we have indicated below other requirements that if not already part of the ship's SGS must be included, unless the Captain does not believe this to be appropriate, in which case the decision must be justified before this Inspectorate for confirmation and modification.

Before proceeding with the works, both the Deck area and the Tank area where the works are to be carried out need to be cleaned in accordance with the last cargo transported by the Vessel. A GASFREE certificate must be submitted specifying the product's:

LIE

LSE

TLV

and the explosivity value at the time of Inspection, measured using an approved explosimeter, which must be less than 1% of its LIE.

During the works on the Tank:

* The tank work areas on all sides, bottom and adjacent horizontal surface areas (stringers, longitudinals ...) must be free from hydrocarbon residues.

* The temperature must not cause thermal fatigue.

* There must be the least possible number of workers.

* The concentration of gases must be lower than its TLV.

* In the immediate surroundings there must be:

- Adequate lighting
- Autonomous Breathing Apparatus
- Safety harnesses
- Portable safety VHF radio

* Outside there must be a permanent watchman with VHF.

* The explosimeter must be periodically used to check the atmospheric conditions in the workplace.

* Oxyacetylene bottles or apparatus must never be inserted into the Tank.

* Two dry powder portable extinguishers must be placed in the mouth of the Tank.

* The percentage of O2 in the Tank must be 21% throughout the operation.

* When removing the valves blind flanges must be installed to ensure that toxic or explosive gases are not released during the works.

* There must be forced ventilation within the Tank moved through the anti-fire system from the tank openings on the Main Deck.

If works are to be carried out on the Main Deck and its pipes, these may be cut once they have been degasified and filled with water. Welding on pipes and deck supports must be carried out Gas Free for the pipes and the areas under these, as well as those immediately adjacent.

If hot works are also to be carried out in the Engine Room:

a) The fuel tank lead lines must be completely closed.
b) Bunker must not be carried out until 3 hours after the works.
c) The ventilation and extraction in the Engine Room must be permanently operational.
d) The fuel pipes and the bordering of the fuel pipes or its spill trays must not be cut or heated.
e) Portable extinguishers and pressurised anti-fire hose with fog nozzle must be available and ready-to-use in the work place.
f) The rear faces of the work area must be inspected and regularly checked.

Before proceeding with the repairs the aforementioned GAS FREE CERTIFICATE must be obtained. The vessel must remain GAS FREE throughout the work period.

Fuel may not be supplied whilst the works are being carried out.

All workers involved in the repairs must be provided with regulation PPE for each job that they carry out.

The company must submit a photocopy of this document to the Ship's Captain prior to commencing the requested works and to the Company in charge of the repairs.

Annex E

Servyman's e-mail to the Maersk Terminal Operations and Planning Departments and agent dated 14 November 2008

From:
To:
Sent: 28 January 2009 09:26
Subject: FW: MAERSK NEWPORT - REPAIRS

MAIB Inspector
Direct no:
Exchange: + 44 (0)23 80 395 500
email:

From:
Sent: 27 January 2009 10:10
To:
Subject: RV: MAERSK NEWPORT - REPAIRS

De:
Enviado el: viernes, 14 de noviembre de 2008 12:18
Para: 'ALRAPMTVSL'; 'ALRAPMTPLN'; 'alrapmtops@apmterminals.com'
CC: 'ALRAGY sent by Marquez, Jose Luis'; 'TOOPSCONC sent by Jacobsen, John'
Asunto: MAERSK NEWPORT - REPAIRS

Good day:

Be kindly informed that we have been appointed by APM Technical Organization to assist MAERSK NEWPORT during her portstay in ALR Terminal.

Although repairs already started on Breakwater pier, and will be continue there once cargo operations accomplish, due to time constriction we will continue our attendance during operations, following repairs being performed:

RENEWING HULL PLATE ON FORE PEAK, VOID SPACE (ABOVE FORE PEAK), BALLAST TANK AND CARGO HOLD BILGE TANK IN THE BOW.-

We will of course, do not interfere vessel's cargo operations, but please note that mobile crane will attend this task.

Our attending foreman for this task will be Mr.

Your collaboration on this matter highly appreciated.

Awaiting your further comments if any.

Brgds.

SERVYMAN DEL ESTRECHO, S.L.

Annex F

Air Liquide S.A.’s burning equipment inspection report dated 19 November 2008

(AIR LIQUIDE logo)

SUBJECT: Incident 08-11-17

Málaga November 19th, 2008

As per meeting held yesterday about the oxygen and acetylene cylinder explosion, occurred last Friday AM, during the repair works being performed on board the vessel MAERSK NEWPORT, berthed at Algeciras port, be informed, as follows:

1. We cannot determine the cause of the explosion because the ignition origin is unknown.

   So that a fire can occur, it is necessary the existence of a Fuel (Acetylene), Comburent (Air or Oxygen) and an ignition spot which, as per information received, it is unknown.

   It has certainly been proved that the fire was not a consequence of a flash back from the torch, since only the piece of hose in the vicinity of the cylinders has been found burnt damaged.

   Furthermore, it has been proved that the flash-back arrestors fitted at the torches are in sound working condition.

2. It has been verified that both, the acetylene and the oxygen cylinders were placed in their respective baskets, located not farther than 1.5 meters away, for which the fire on the acetylene cylinder increased the oxygen cylinder inner pressure provoking its explosion and this, as a result, boosted the fire on the acetylene cylinder.

3. The three torches, being used, were connected to cylinders grouped in their baskets; therefore, the fire produced on one of them was transmitted to the rest.

Annex G

Extract from KGW operating manual – “raising anchor”

Raising of anchor

CAUTION!

When the anchor chain is to be raised, the vessel should move slowly ahead to relieve the pressure on the anchor winch.

1. Check whether control switch is in position "manual". If not, set it in this position (indication light "Ready" illuminated).
2. Check that the drum brakes and cable lifter brake are applied tightly. If not, apply them tightly.
3. Disengage mooring drum. To this effect, relieve the coupling from load using the push button, then lift the coupling lever and turn it towards the mooring drum. Engage it in the end position.
4. Slacken by briefly pushing the master switch / push button until the claw of the coupling is in the right position to the cable lifter .
5. Engage cable lifter by lifting the coupling lever and turning it away from the cable lifter. Engage it in the end position on position switch .
6. Release chain stopper according to the manufacturer's instructions.
7. Release cable lifter brake .
8. Heave anchor chain by turning the master switch . The revolutions have to be adequate for this manoeuvre. The third revolution stage in the anchor operation is blocked.

CAUTION!

Before lifting the anchor into the hawsehole, switch into first revolution stage.

The anchor-mooring winch is equipped with a length registering device for the smooth lifting of the anchor into the hawsehole. This device registers the lowered length of chain and stores the value.
When raising the anchor, the chain length is counted. When the anchor is at a distance of only approximately 2,0 m from the hawsehole, the motor is switched back into the first revolution stage automatically and the anchor is pulled into the hawsehole at this speed.

CAUTION!

The operator has to observe the manoeuvre even with installed length registering device. In case that automatic switching fails, the drive must be set immediately to revolution step one manually and the anchor has to be raised into the hawse hole by this speed.

9. Apply the cable lifter brake tightly after the anchor has been homed completely and lash the anchor safely in the anchor pocket by means of the lashing device of the chain stopper.
   Release the cable lifter brake afterwards and drive the windlass in lowering directly briefly to take the load from the windlass.
10. Swing the chain stopper lock inwards until it rests on the chain. It is not necessary that the horizontal chain link is stopped in this position.
11. Fasten cable lifter brake .
12. Disengage cable lifter. For this lift coupling lever and turn it towards the cable lifter. Engage it in end position on the position switch .

CAUTION!

During operation of mooring drum or warping end, the cable lifter brake is to be relieved by the weight of the anchor, i. e. the load of the anchor is to be absorbed bei either the cross-bar or the lashing device of the chain stopper.

Annex H

GSMS Section 4.2 Anchoring and Use of Anchors, ID 1383, dated 15 March 2007

GSMS

Apps home page

Editor.:TVO-TANK/MSC| **Approver.:**Head of Marine Dept | **Released By.:**APMM TO Q-Manager | **Revision Date.:**15/03/2007 | **Revision Number.:**3 | **Document ID.:**1383

4.2 Anchoring and Use of Anchors

Purpose

The purpose of this procedure is to ensure safe anchoring of vessels and correct use of anchors.

Scope

This Procedure applies to all vessels managed by Technical Organisation /Management.

Roles and responsibilities

It is the responsibility of the Master to ensure compliance with this procedure.

Description

Anchoring - Arrival at anchorage.

Windlass - Preparing Before Arrival

The windlass shall be made ready well before arrival. It is important that timely request for power is made by notifying the engineer on duty.

Anchor Lights and Daylight Signals

Anchor lights shall be tested well in advance when the vessel is to anchor at night.

Daylight anchor signals shall also be checked in ample time before use.

Anchoring

The selected anchorage shall be plotted on the chart and the Master shall satisfy himself that there is sufficient room to swing even in unfavourable weather conditions. In this connection account shall be taken of the vessel's type, length and the length of chain used.

When the anchor is about to be released, it is important to remember, particularly in large vessels, that the officer on the forecastle head will often be the person in the best position to decide when the vessel is stopped and making no way through the water.

Unless special circumstances prevail, the process of anchoring shall be as follows:

When the depth is less than 40m:

When the ship arrives at the intended place of anchorage the clutch of the windlass to be used shall be engaged, the brake loosened and the anchor lowered to sea level, the brake applied and the clutch is disengaged.

When the ship lies dead over the ground the chain and anchor should be lowered until touching the bottom by releasing the brake.

At this time, the brake should be applied to prevent the chain from piling up on the bottom and/or running out in its entire length. And then the desired length of chain can be lowered in the water.

When the depth is more than 40m:

When the ship arrives at the intended place of anchorage the clutch of the windlass to be used shall be engaged, the brake loosened and when the ship lies dead over the ground the anchor shall be walked out until touching the bottom.

At this time the brake shall be applied and the clutch disengaged and it shall again be ascertained that the ship is lying stopped on the position, e.g. by observing the chain. Paying out the desired length of chain should be done by releasing the brake and paying out one shackle at a time, allowing the chain to tighten up before paying out the next shackle. Thereby avoiding the vessel to pick up more speed than what can be stopped by the chain.

Controlling/Ascertaining Position at Anchorage

The vessel cannot be considered "brought up" until it has been ascertained that the anchor is holding. This can be observed by the anchor chain tightening up to a certain load and then slackening off to stabilise at a lesser load. If necessary, a "kick astern" can be used to obtain the appropriate weight on the chain before it slacks up. If the chain is "jumping" or fails to slack up the anchor may not be holding and more chain should be paid out.

The ship's position and drift shall be checked by frequent use of electronic navigational equipment, and as far as circumstances allow, by terrestrial means of positioning.

Two anchors should be employed during storm and heavy seas if conditions so require. This is to reduce the risk of drifting and of breaking the chain. Also, two anchors will to some degree prevent yawing, in particular with an empty ship. Moreover, the increased chain weight will decrease the forces exerted on anchors and windlass. In tidal waters, the chain of the second anchor should preferably be a short one, which will also make hauling-in faster on change of current.

Assistance by using propeller in heavy weather should be kept in mind when the chains are subjected to heavy strain, but care must be shown with engine power so as to avoid falling athwart ship to the wind, which may add to the strain on the chains.

Calling the Master shall be a firm rule for the Officer of the watch if the ship starts drifting or if another ship is closing up dangerously, if the wind freshens noticeably in an exposed position, if the direction and force of current alters and if fog or other unfavourable conditions prevail.

Swaying around during prolonged Anchoring

During an extended time of anchoring, a running check shall be kept of the ship's movements and an entry made in the logbook each time the ship has made a full turn.

When 15 uniform turns have been made as identified by the course recorder or estimated the anchor shall be hauled up for the purpose of clearing the turns out of the chain, where after re-anchoring takes place.

Heaving in of Anchors

Utilising engine power, thrusters and rudder for easing the weight on the windlass may be considered, especially if the chain leads round the stem (the bulb).

If possible, the chain should be spray-washed when heaving in.

Heaving the anchor into the hawse pipe shall be effected at a low rate of speed in order not to damage the chain. Anchors are known to have jammed in the hawse pipe by incorrect heaving. To prevent this it is important that the chain has been cleared of turns and that the anchor is placed correctly in the hawse before final hauling-in is done. The Master shall ensure that new officers are familiarised with the procedure of anchoring and are made aware of circumstances particular to the individual ship in preparing for anchoring and weighing of anchor.

If the chain has a turn in it an attempt should be made to clear the chain by using engine and rudder if available room and weather conditions permit. If that is not possible an attempt by hauling-in and lowering, letting the anchor untwist itself whilst slowly recovering

same should be made.

In a port or in roads where lack of room necessitates anchoring with 2 anchors, it is recommended that tugs assist in clearing the turns, whereby time is saved and greater stress is avoided.

Attention is made to the problem in some vessels where the chain did not stack correctly in the chain locker. Carefully listen if anchor chain is stowing in chain locker is recommended. The officer on watch must ensure that the assistant on the forecastle pays special attention to the chain pipe.

Securing of Anchors

The anchors must be properly secured before commencement of a sea passage.

Anchor lashings must be made from galvanized chain of sufficient strength - and never from wire which is difficult to inspect for remaining strength.

To avoid loosing anchors during heavy weather you have 4 steps of securing:

1. The anchor lashing chains.
2. The chain stopper.
3. The anchor brakes.
4. If also engaging the clutch, it should be left without strain on it, so that it can be disengaged even without power supply to the windlass.

Port navigation, Canal Navigation and River Navigation

During navigation in ports, canals and rivers, anchor lashing shall be removed, and the windlass made ready for use. In navigating these areas the Master shall carefully evaluate under which conditions a watch should be positioned on the forecastle to ensure that anchoring may be carried out at short notice.

Spare Anchor

Spare anchors, where available, shall always be readily available.

Inspection of Chains

At each ordinary dry-docking, the chains shall be ranged out to end and be carefully inspected for defects including loose studs and pins in shackles. Pins are to be renewed as necessary. Defects found shall be remedied soonest, if necessary by replacing the length in question by a new length, if otherwise the chain does not comply with required length according to regulations.

The foremost 15-fathom lengths are more exposed to wear than the subsequent lengths in ships which frequently use their anchors. At dry-docking, the foremost lengths shall be

changed to the aftermost in order to distribute the wear evenly.

The result of inspections shall be entered in the vessel's logbook and survey book.

References

Definitions

Annex I

GSMS Section 4.4 Voyage Data Recorder (VDR) and Simplified Voyage Data Recorder (S-VDR) – ID 9874, dated 9 July 2008

GSMS

Apps home page

Editor.:FMO035/TOOPSCONNAU| **Approver.:**HPM001/TOOPSNAU | **Released By.:**APMM TO Q-Manager | **Revision Date.:**09/07/2008 | **Revision Number.:**0 | **Document ID.:**9874

4.4 Voyage Data Recorder (VDR) and Simplified Voyage Data Recorder (S-VDR)

4.4.1 VDR and S-VDR overview

VDR and S-VDR equipment has been mandated for carriage on both new ships (VDR) and existing ships (S-VDR) according to schedules agreed at IMO. Similar to the black boxes carried on aircraft, VDR equipment enables accident investigators to review procedures and instructions in the moments before an incident and helps to identify the cause of any accident.

Additionally, S-VDR provides the vessel operator and owner with information that can enhance ship operation and management, and provides the owner/operator with a comprehensive record of events during a given period.

4.4.2 VDR requirements

Performance standards for VDRs were adopted by IMO in 1997 with phased implementation from 2002. Subsequent IMO performance standards for S-VDR require implementation from 2006.

VDR should continuously maintain sequential records of preselected data items relating to status and output of the ship's equipment and command and control of the ship. As a minimum, the following parameters must be recorded: date and time, position, speed, heading, radar data, echo sounder data, mandatory alarms, rudder data, telegraph data, hull opening and watertight door status, as well as wind data and accelerations and hull stresses. VDR and S-VDR equipment also records all VHF communications and all verbal communication in the wheelhouse.

The VDR should be installed in a protective capsule that is brightly coloured and fitted with an appropriate device to aid location. It should be entirely automatic in normal operation.

4.4.3 S-VDR requirements

An S-VDR is not required to store the same level of detailed data as a standard VDR, but nonetheless should store, in a secure and retrievable format, information concerning the position, movement, physical status, command and control of a ship over the period leading up to and following an incident.

4.4.4 Preserving records

In some designs of VDR and S-VDR, the speedy intervention of the master or other person on board is needed following an incident to ensure the data is saved. With these models, if there is no manual intervention, the data will be overwritten within 12 hours and so will not be available to the accident investigator. It is therefore essential for masters, watchkeeping officers and accident inspectors to be aware of the features of particular systems fitted to ships.

Annex J

GSMS, Safety Rules for Hot Work Repair – ID1119, dated 30 June 2008

GSMS

Apps home page

Editor.:FM0035/ TOOPSCONNAU| **Approver.:**HPM001/ TOOPSNAU | **Released By.:**APMM TO Q-Manager | **Revision Date.:**30/06/2008 | **Revision Number.:**2 | **Document ID.:**1119

Safety Rules for Hot Work Repair - All Vessels

Purpose

To bring hot work procedures in line with industry requirements.

Scope

This procedure applies to all Vessels

Responsibility

The Master is responsible for the implementation and compliance with this procedure.

Definitions

A. Cold Work

Work which cannot create a source of ignition.

B. Hot Work

Work involving sources of ignition or temperatures sufficiently high enough to cause the ignition of a flammable gas mixture. This includes any work requiring the use of welding, burning or soldering equipment, blow torches, some power driven tools, portable electrical equipment which is not intrinsically safe or contained within an approved explosion-proof housing, and internal combustion engines.

Roles and responsibilities

Master

The Master's express permission is required in each particular case before hot work repair is initiated outside the engine room or in the engine room where bulkheads or piping are adjacent to bunker tanks, cargo spaces, pump rooms, etc.

Chief Engineer

The Chief Engineer is responsible for the instructions to the crew and repairmen.

Safety Officer

A Safety Officer shall be appointed.

When hot work is carried out on board tankers, or larger jobs are undertaken on board dry cargo vessels, a safety officer might join the vessel for the purpose of assisting the Shipboard Management. The Safety Officer's presence does not interfere with the above stated division of responsibilities.

If a safety officer is not allocated by the technical management, the Master shall appoint an officer among the vessel's officers preferably the Chief Officer to act as Safety Officer. The appointed officer shall not be engaged in other work during those periods in which he acts as a Safety Officer.

Responsible officer

A responsible officer shall personally carry out all measurements for gas and oxygen.

Description

The following safety rules detail the minimum requirements which shall be observed whenever repair work is undertaken on board whether or not the repairs are carried out by the crew or by repairmen. All personnel involved in repair on board should be familiar with these rules.

The performance of any repair work in a satisfactory and effective manner requires careful planning and, co-operation between those involved and strict observances of the prescribed rules.

Although the rules have been carefully prepared, instances may occur where they are not fully adequate, and in such events, as a matter of course, the ship's management shall ensure that supplementary measures are taken.

1.0 Toolbox Meeting

Before hot work is initiated, a Toolbox meeting shall be held wherein the planned work and the safety precautions shall be carefully reviewed.

The requirements for hot work permission must be evaluated - ref procedure id.1121,

1122 and 1123, and in case required a request issued according to 5.0.

In addition to the Master, who presides over the meeting, the following persons should normally attend:

- Chief Engineer
- Second Engineer

The Master drawing up a written approval of the planned work and signing of the Work Permit concludes the meeting.

2.0 Restrictions & Precautions

General Hot Work Restrictions

Hot work shall not be carried out:

- During bunker operations.
- In areas less than 50 cm from uncleaned fuel tanks, unless special circumstances prevails.
- On heating coils, pipelines and valves, unless the appropriate item has been detached from the system by cold work and the remaining system blanked off.
- On Ammonia or Freon systems until all traces of Ammonia or Freon have been removed.

General Precautions

- A Safe Job Analysis and Permit to Work shall be made out.
- Combustible materials shall be removed to a safe distance of at least 3 metres from the place of work.
- Cargo and stores in the vicinity shall be screened off by non-flammable material, to prevent ignition.
- The place of work shall be thoroughly cleaned for flammable material. Heavy layers of dust on bulkheads, ship's sides, decks, and tank top shall also be removed.
- The place of work shall be kept well ventilated with open hatches, man holes, etc. Additional supply of fresh air to be considered.
- When carrying out hot work on bulkheads and decks adjacent to other spaces, these shall also be checked and watched. Wooden linings and/or insulation behind such bulkheads must be removed.
- When work is undertaken on ventilation ducts, the openings of ducts reaching other cargo holds shall be effectively blanked off thus avoiding any risk of a fire spreading through the venting system.
- Precautions to be made to prevent ingress of welding fumes into containers, reefer container especially.
- During the entire repair period detailed entries shall be made each day in the ship's

log book on the progress of repairs including information detailing the gas measurements carried out.

Hot Work in Holds

- Adjacent cargo shall be covered in order to avoid damage by falling sparks/ red-hot
- With cargo underneath, cutting shall be done by grinding, whenever possible.

Hot Work in tanks and confined spaces

- All precautions for entering into enclosed space shall be followed as per procedure ID 1133.
- When repair work is to take place in tanks and cofferdams where the temperature and humidity might be high, the adjacent deck(s) should be kept cooled with water. However precautions are to be taken that water cooling does not interfere with electric welding.
- If repair work involves oil tanks, adjacent structures within 50 cm of such tanks, or oil piping, the safety rules for tankers - id. 1122 - shall apply, irrespectively of vessel

3.0 Enclosed Space - Atmosphere Measurement

Permission to start hot work shall only be given when the atmosphere is measured to zero LEL - in conjunction with an oxygen reading of at least 20.9% by volume.

Atmosphere shall be confirmed safe in all adjacent and diagonally located compartments.

During hot work LEL measurements shall be taken at intervals of no more than four hours in all cargo tanks, pump rooms, cofferdams and other spaces where gas may be found.

If the hot work is discontinued for meal breaks or for other reasons, LEL and oxygen measurements shall be carried out at the place of work before work is resumed.

4.0 Fire Fighting Equipment and Fire Watch

At least two readily accessible fire extinguishers shall be placed near the place of work.

One or two fire hoses provided with fog nozzles shall be available for immediate use near the place of work.

A fire watch shall be constantly maintained at the place of work. He shall wear adequate protection against heat- and UV radiation from hot work operation, and must not be assigned to other duties.

If the fire watch is unable to gain proper radio contact or quick access to the deck and raise the alarm, a watchman shall be posted as relay at the opening to the tank or compartment in question.

The personnel engaged in the repair work shall be instructed in the use of the fire fighting appliances and in raising the fire alarm.

5.0 Hot Work Request

When permission for hot work is required by procedure 1121, 1122 or 1123, a request must be forwarded to the Technical Management, in the following written format:

1. "Hot work"
2. Place at which work is to be carried out (at sea or in port)
3. Date and time of start and expected completion
4. An exact description of the work to be carried out.
    - Remarks such as "etc.", "and so on", "and the like" shall not be used.
    - Reference to guarantee number or repair list items is not accepted - the work in question shall be described.
    - Attachment of sketches/ photos to be considered.
5. Information on who is designated to carry out the work.
6. Information on who will act as safety officer during the work.
7. Supplementary information/remarks.

The Technical Management shall reply to the request in the following form:

1. Acceptance or rejection
2. Special instructions
3. References

When permission for hot work has been received, the work shall commence as soon as possible and be carried out as speedily as conditions allow.

References

1121 - Safety Rules for Hot Work, Specific to Dry Cargo Ships

1122 - Safety Rules for Repair and Hot Work Repair Work for Gas & Oil Carriers

1123 - Safety Rules for Repair and Hot Work Safety Rules for Supply Vessels

1133 - Entering Enclosed or Confined Spaces

1092 - Oxy-Acetylene and Argon welding equipment

9999 - Risk Management - General

Annex K

GSMS – Induction Programme for Contractor's Employees –
ID 0801, dated 7 May 2007

GSMS

Apps home page

Editor.: Marine Dept| **Approver.:**Head of Marine Dept | **Released By.:**APMM TO Q-Manager | **Revision Date.:**07/05/2007 | **Revision Number.:**1 | **Document ID.:**0801

Induction Programme for Contractor's Employees

Objective

To ensure a standard induction programme for contractors.

Responsibility

The shipboard management team is responsible for implementation of this procedure. All contractors are responsible for compliance with this procedure.

The shipboard management shall evaluate the individual work processes and promulgate any risk activities.

Procedure

Contractors joining shall undergo a safety familiarisation by a responsible officer. On completion of the familiarisation, the new contractors shall receive departmental induction covering safe working practices and areas of responsibility. Particular attention shall be paid to the to the following areas:

- Safe and secure stowage of loose items.
- Proper securing of doors etc.
- Avoidance of overloading of electrical circuits.
- Smoking regulations.
- Permit to Work, Safe Job analysis, and Toolbox Talk.
- Work with chemicals.
- Correct methods of disposal of waste oils, chemicals and garbage.
- Maersk Vessels Safety Guide.

Contractors shall:

- ensure that they are properly rested prior to commencing work
- ensure that the working conditions and environment on board are kept in a safe and healthy condition,
- act in a responsible way and take all necessary and relevant precautions to protect themselves and their fellow workers from injury and preventable illness, and for the protection of the environment, including taking adequate rest breaks during the task being undertaken.
- be aware of and make full use of all protective measures, devices, equipment and clothing provided for safe work condition,
- ensure that where hazards exist or are created (e.g. by removal of platforms, rails etc.) they will be properly fenced off and sign posted until such time as again rendered safe,
- ensure that accidents and dangerous occurrences to personnel, equipment and environment are reported as soon as possible to the responsible Officer,
- ensure any unsafe practices and conditions discovered are reported instantly.

Local contractors

It is the Chief Engineer's responsibility that local repairmen on board for the port stay are introduced to their task and receives proper safety instructions, and a clear explanation of the vessel's alarm signals and emergency assembly station.

References

Definitions

Annex L

Section 7.1.7 of GSMS Technical Casualty Manual for Technical Organisation – ID 1183, dated 1 July 2008

7.1.7 British registered vessels:

Where a UK flagged ship has sustained or caused any accident occasioning loss of life or any serious injury to any person or has received any material damage affecting her seaworthiness or her efficiency either in her hull or in any part of her machinery, the Owner or Master shall, as soon as possible after the accident or damage has happened, transmit to the MAIB, by letter signed by the Owner or Master , a report of the accident or damage and of its probable occasion, stating the name of the ship, her official number if any, the port to which she belongs and the place where she is.

The IRF form should be filled-in and submitted to the MAIB

Annex M

Air Liquide’s Material Safety Data Sheet - AL001 for Acetylene dated 15 July 2005

Acetylene (dissolved)

AL001

Label 2.1 : flammable gas.


F+ : Extremely flammable

1 IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Trade name : Acetylene (dissolved)
MSDS No : AL001
Chemical formula : C2H2
Company identification : AIR LIQUIDE SA
France
See paragraph 16 "OTHER INFORMATION"
Emergency phone nr : See paragraph 16 "OTHER INFORMATION"

2 COMPOSITION / INFORMATION ON INGREDIENTS

Substance / Preparation : Substance.

Substance name	Contents	CAS No	EC No	Index No	Classification
Acetylene (dissolved)	100 %	74-86-2	200-816-9	601-015-00-0	F+; R12 R5 R6

Contains no other components or impurities which will influence the classification of the product.

3 HAZARDS IDENTIFICATION

Hazards identification : Dissolved gas.
Extremely flammable.

4 FIRST AID MEASURES

First aid measures
- Inhalation : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.
In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.
Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- Ingestion : Ingestion is not considered a potential route of exposure.

5 FIRE-FIGHTING MEASURES

Flammable class : Extremely flammable.
Specific hazards : Exposure to fire may cause containers to rupture/explode.
Hazardous combustion products : Incomplete combustion may form carbon monoxide.
Extinguishing media
- Suitable extinguishing media : All known extinguishants can be used.
Specific methods : If possible, stop flow of product.
Move away from the container and cool with water from a protected position.
Continue water spray from protected position until container stays cool.

5 FIRE-FIGHTING MEASURES (continued)

Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/ explosive re-ignition may occur. Extinguish any other fire.

Special protective equipment for fire fighters : In confined space use self-contained breathing apparatus.

6 ACCIDENTAL RELEASE MEASURES

Personal precautions : Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Evacuate area.
Ensure adequate air ventilation.
Eliminate ignition sources.

Environmental precautions : Try to stop release.

Clean up methods : Ventilate area.

7 HANDLING AND STORAGE

Storage : Segregate from oxidant gases and other oxidants in store.
Keep container below 50°C in a well ventilated place.

Handling : Ensure equipment is adequately earthed.
Avoid contact with pure copper, mercury, silver and brass with greater than 70% copper.
Suck back of water into the container must be prevented.
Purge air from system before introducing gas.
Do not allow backfeed into the container.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Keep away from ignition sources (including static discharges).
Refer to supplier's container handling instructions.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal protection : Ensure adequate ventilation.
Wear suitable hand, body and head protection. Wear goggles with suitable filter lenses when use is cutting/welding.
Do not smoke while handling product.

9 PHYSICAL AND CHEMICAL PROPERTIES

Physical state at 20 °C	: Dissolved gas.
Colour	: Colourless gas.
Odo(u)r	: Garlic like. Poor warning properties at low concentrations.
Molecular weight	: 26
Melting point [°C]	: -80.8
Boiling point [°C]	: -84 (s)
Critical temperature [°C]	: 35
Vapour pressure, 20°C	: 44 bar
Relative density, gas (air=1)	: 0.9
Relative density, liquid (water=1)	: Not applicable.
Solubility in water [mg/l]	: 1185
Flammability range [vol% in air]	: 2.4 to 83

9 PHYSICAL AND CHEMICAL PROPERTIES (continued)

Auto-ignition temperature [°C] : 325

10 STABILITY AND REACTIVITY

Stability and reactivity : Can form explosive mixture with air.
May decompose violently at high temperature and/or pressure or in the presence of a catalyst.
Forms explosive acetylides with copper, silver and mercury.
Do not use alloys containing more than 70% copper.
Dissolved in a solvent supported in a porous mass.
May react violently with oxidants.

11 TOXICOLOGICAL INFORMATION

Acute toxicity : No known toxicological effects from this product.

12 ECOLOGICAL INFORMATION

Ecological effects information : No known ecological damage caused by this product.

13 DISPOSAL CONSIDERATIONS

General : Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor.
Do not discharge into any place where its accumulation could be dangerous.
Contact supplier if guidance is required.

14 TRANSPORT INFORMATION

UN No. : 1001
H.I. nr : 239
ADR/RID
- Proper shipping name : ACETYLENE, DISSOLVED
- ADR Class : 2
- ADR/RID Classification code : 4 F
- Labelling ADR : Label 2.1 : flammable gas.
Other transport information : Avoid transport on vehicles where the load space is not separated from the driver's compartment.
Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.
Before transporting product containers :
- Ensure that containers are firmly secured.
- Ensure cylinder valve is closed and not leaking.
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
- Ensure valve protection device (where provided) is correctly fitted.
- Ensure there is adequate ventilation.
- Compliance with applicable regulations.

15 REGULATORY INFORMATION

EC Classification : Index No : 601-015-00-0
F+; R12
R5
R6

EC Labelling

- **Symbol(s)** : F+ : Extremely flammable
- **R Phrase(s)** : R5 : Heating may cause an explosion.
R6 : Explosive with or without contact with air.
R12 : Extremely flammable.
- **S Phrase(s)** : S9 : Keep container in a well-ventilated place.
S16 : Keep away from sources of ignition - No smoking.
S33 : Take precautionary measures against static discharges.

16 OTHER INFORMATION

Ensure all national/local regulations are observed.
Ensure operators understand the flammability hazard.
The hazard of asphyxiation is often overlooked and must be stressed during operator training.

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws.

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.
Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

Recommended uses and restrictions : This SDS is for information purposes only and is subject to change without notice. [Prior to purchase of products, please contact your local AIR LIQUIDE office for a complete SDS (with Manufacturer's name and emergency phone number).]

End of document

British Oxygen Corporation Gas Equipment Operating and Safety Instructions – Section 3

SECTION 3
LEAK TESTING AND PURGING THE SYSTEM

SAFETY

Before carrying out the leak test or purging procedure ensure that the operator is using all the correct safety equipment, overalls, safety glasses and safety shoes as a minimum.

GENERAL

Before lighting, a newly assembled oxy-fuel system should be tested to ensure there are no leaks present.

LEAK TEST PROCEDURE

1. Ensure that all equipment connections are tightened in accordance with the manufacturer's instructions.
2. Ensure that the pressure-adjusting knobs on both regulators are fully open. (Turn anti-clockwise)
3. Close both the fuel gas and oxygen torch valves.
4. Open the oxygen cylinder valve about half a turn
5. Turn the oxygen regulator pressure-adjusting knob clockwise until a small amount of pressure registers on the outlet pressure gauge.
6. Close the oxygen cylinder valve.
7. Follow the same procedure for the fuel gas.
8. Using a proprietary leak testing solution such as the BOC CFC Free Leak Detector Spray (BOC Part Number: 3731) or a mixture of 1% Teepol in de-ionised water.

WARNING!

NEVER USE A SOLUTION OF SOAPY WATER OR A NAKED FLAME TO TEST EQUIPMENT FOR LEAKS

---

1. Leaks must be corrected immediately by tightening connections. Do not over tighten. If the connection requires excessive force then it is likely that there is a more serious fault with it.
2. If leaks persist, the connections must be replaced. Do not use the equipment if a persistent leak is detected.
3. Open the equipment valves to release pressure, adjust the regulators to zero outlet pressure and close the equipment valves.
4. After leak testing all testing solution should be cleaned off using a clean, oil and grease free cloth.

NOTE: Any leakage from the regulator bonnet holes means that the regulator safety bursting disc has burst. The regulator must be replaced. Contact your local BOC

Annex O

Holdstock Technical Services report R0054 dated 2 March 2009
(on behalf of Tension Technology International)

holdstock
technical services

3000 Manchester Business Park
Aviator Way
Manchester M22 5TG

Tel: +44 (0)870 099 2250
Fax: +44 (0)870 099 2251

Report Date: 2 March 2009

Client name:	TTI Testing
Client order no. /reference:	
Client address:	3a Charles Ave Arbroath DD11 2EY
Job reference:	HTS0064
Report title:	Investigation of electrostatic charging and discharging of marine mooring rope
Description of sample(s):	8 strand braided polypropylene mooring rope, 80 mm Ø a) Wound 3 layers deep by 6/7 coils wide onto a steel flanged core (Figure 1) b) 80 cm length sample of rope taken from ~2 m back from failed end of line (herein after “Burn End”) c) 80 cm length sample of rope taken from ~2 m back from eye end of line (herein after “Eye End”)
Sample(s) received:	18/02/09 & 27/02/09
Date of testing:	18 - 27/02/09

Introduction

The purpose of testing is to determine if the rope sample can be electrostatically charged to level sufficient to generate incendiary discharges. Three types of test are carried out: i) resistance measurements, ii) charge decay time measurements, and iii) charge transfer measurements.

Resistance measurements provide an indication of the ability of a material to dissipate charge by conduction to earth. If the resistance is sufficiently low, the rate at which charge is dissipated will equal the rate at which charge is generated; the net result being no significant charge on the material.

Charge may dissipate from materials by mechanisms other than conduction. If the surface of a material contains sharp points or elements with a small radius of curvature, e.g. textile fibres, a weak electrostatic discharge called *corona* may occur. Corona is a form of electrostatic discharge that contains so little energy that it is regarded as non-incendiary except to the most sensitive of flammable atmospheres. Corona ionises the air in the immediate vicinity of the charged surface and the ions released by this process combine with and neutralise charge on the material. Charge decay time measurements provide information on the rate at which charge can dissipate from the material under test via whatever mechanisms may be present, including conduction and corona. The test procedure also provides a measure of any residual charge, i.e. charge remaining on the material under test after rapid dissipation mechanisms have ceased.

Residual charge may cause an electrostatic discharge if the material is approached by a large or earthed conductor. Charge transfer measurements are used to determine if such discharges occur and provide some indication as to whether any discharges are likely to cause ignition of a flammable atmosphere. The amount of charge transferred in electrostatic discharges is only an indicator of the probability of ignition because the measurement takes no account of the spatial or temporal distribution of energy contained in the discharges. Nevertheless, if discharges are recorded that show significant charge transfer, this would be cause for further investigation, including ignition testing.

All testing is conducted in temperature and humidity controlled laboratories. Initial tests are carried out under conditions that approximate to those in which the rope is reported to have been used (i.e. 16 ºC, 68 % RH). As the electrostatic properties of materials show a high dependence on atmospheric conditions, particularly humidity, tests are also done at low humidity, which is more representative of worst case conditions.

There are no specific standards or codes of practice that cover mooring ropes used in the presence of flammable gases. The CENELEC code of practice, CLC/TR 50404:2003 *Electrostatics: Code of practice fo r the avoida nce of haz ards due to stati c ele ctricity*, does give guidance and general recommendations that can usefully be applied.

Atmosphere for Conditioning & Testing

High Humidity: Temperature: 20 ± 2 ºC, Relative Humidity: 65 ± 5 %, Conditioning Time: 1 hour.

Low Humidity:

a) Temperature: 23 ± 2 ºC, Relative Humidity: 25 ± 5 %, Conditioning Time: 45 hours.
b) Temperature: 23 ± 2 ºC, Relative Humidity: 35 ± 5 %, Conditioning Time: 3 hours.

Test Methods

Point-to-Point Resistance

Rope on Core

A length of rope, approximately 1.5 m long is unwound from the core and is placed on four insulating plastic plates (278 mm × 208 mm × 8 mm) of volume resistivity greater than 10^{13} Ω.cm. A pair of electrodes is formed around the rope using 50 mm wide self-adhesive aluminium tape (Figures 2 & 3). The electrical resistance between the electrodes is measured using an Eltex Type 6206 Tera-ohm-meter under an applied potential of 250 V d.c. Measurements are made with electrodes positioned in two ways: a) electrodes formed around entire circumference of the rope, and b) electrodes formed around the circumference of a single rope strand. In the latter case, the electrodes are placed on the same strand as it appears at the rope surface at an adjacent braiding pattern repeat.

Loose Sample of Rope

The loose sample of rope is placed on a single plastic plate (1000 mm × 150 mm × 4 mm) of volume resistivity greater than 10^{13} Ω.cm. Point-to-point resistance is measured using electrodes formed as described above, but with an Agilent 4339B High Resistance Meter.

Resistance To Earth

Using the same arrangement as point-to-point resistance, the electrical resistance is measured between one electrode placed around the entire circumference of the rope and the steel core on which the rope is wound. The electrode is formed on the free end of the rope at a distance of about 0.7 m from the core.

Charge Decay Time

The steel flanged core is connected directly to earth and a JCI 140F electrostatic fieldmeter positioned at a distance of 10 cm from the surface of the rope in place on the core. The centre of the fieldmeter measuring aperture is in line with the centre of the third coil in from the right hand side (Figure 4). The JCI 140F fieldmeter is calibrated to produce a reading of the surface voltage when the fieldmeter aperture is 10 cm from the surface being measured. The fieldmeter is connected to a National Instruments USB-6009 data acquisition system and personal computer. The rope is charged using corona produced by a carbon fibre brush connected to a Glassman EL Series high voltage power supply. The charging procedure is to energise the power supply to -10 kV and pass the carbon fibre brush several times over the area of rope immediately beneath the fieldmeter, without the carbon fibre brush touching the rope. The carbon fibre brush is then removed to some distance from the measuring area and the power supply switched off.

For reference purposes and to demonstrate that charging can be achieved on insulating surfaces by the procedure described above, an insulating plastic plate (278 mm × 208 mm × 8 mm) is placed on the rope (Figure 5) and the charging procedure is repeated. The position of the fieldmeter is adjusted so that it remains 10 cm from the surface being measured.

Charge Transfer

The steel flanged core is connected directly to earth and the rope is charged in the same way as described above for charge decay time testing. Immediately after charging, a Schnier HMG 11/02 Hand Coulombmeter is brought up to the surface of the rope in an attempt to provoke an electrostatic discharge (Figure 6). The HMG 11/02 is an instrument designed to record the charge transferred during any electrostatic discharge. It comprises a 25 mm diameter steel ball connected to a capacitor. An internal voltage measuring circuit is calibrated such that the display readout gives the charge transfer in nanocoulomb.

Results

Resistance Measurements

Table 1

Humidity	Distance between electrodes	Point-to-point resistance along complete rope	Distance between electrodes	Point-to-point resistance along single strand	Resistance to earth
65 %	31 cm	5.8×10^6 Ω	20 cm	6.5×10^7 Ω	5.5×10^6 Ω
25 %	30 cm	1.2×10^9 Ω	20 cm	5.9×10^9 Ω	1.9×10^{11} Ω
35 %	30 cm	"Burn End" 2.6×10^{10} Ω	20 cm	"Burn End" 1.8×10^{11} Ω	
35 %	30 cm	"Eye End" 2.3×10^7 Ω	20 cm	"Eye End" 4.9×10^7 Ω	

Charge Decay Time

Table 2

	Rope			Insulating Plastic Plate		
Humidity	Surface voltage immediately after charging	Time for surface voltage to fall by 50%	Residual surface voltage	Surface voltage immediately after charging	Time for surface voltage to fall by 50%	Residual surface voltage
65 %	-1000 V	0.6 s	0 V	-6000 V	>> 30 s	-3500 V
25 %	-3000 V	3.8 s	-650 V	-7000 V	>> 30 s	-4700 V

Charge Transfer (tested at 25 % RH only)

One cycle of testing is charging followed by several attempts to provoke a discharge. During ten complete cycles of testing, no discharges are registered.

Discussion & Observations

The resistance measurement results shown in Table 1 indicate that the surface of the rope under test is not insulating. This is a somewhat surprising result because polypropylene normally has a surface resistance in excess of 10^{13} Ω and is considered to be a good electrical insulator. It is noticeable that the rope's surface is contaminated with paint, rust, grease/oil and other foreign matter. It is a reasonable assumption that salt deposits are also present on the rope. The presence of such contaminants on the rope might well be responsible for the low measure resistances.

To provide some context, CLC/TR 50404:2003 recommends that resistance to earth should be in the region of *100/I*, where *I* is the charging current, i.e. the rate at which electrostatic charge is generated. For most industrial situations involving, for example, the rapid transport of powders, charging currents typically range from 1 μA to 10 mA. Therefore, resistance to earth should be in the range of 10^4 Ω to 10^8 Ω. Measured at 65 % RH, the resistance to earth of the rope sample falls within this range.

Where high charging currents are not present, higher resistance values are acceptable. For example, the surface resistance recommended in CLC/TR 50404:2003 for conveyor belts is 3×10^8 Ω measured at 50 % RH, and for clothing is 2.5×10^9 Ω measured at 25 % RH. The surface resistance (point-to-point resistance) of the rope under test is not incompatible with these limits.

The low measured resistances suggest that conduction alone is able to rapidly dissipate electrostatic charge from the rope's surface when it is connected to earth. This is confirmed by the charge decay time test results. At 65 % RH, charge dissipates rapidly and no charge is left on the surface of the rope. Even at 25 % RH, charge dissipates reasonably quickly and only a small amount of charge is left on the surface of the rope. The charge transfer tests confirm that this residual charge is not sufficient to generate electrostatic discharges when the rope is approached by an earthed conductor.

The resistance measurements made on loose sample lengths of rope suggest that the rope in the area described as the "burn end" may be significantly less conductive than the rest of the rope. Tests on rope from the burnt area and immediately adjacent to it have not been carried out because these areas are reported to be contaminated with sooty deposits that are likely to give misleading results because the sooty deposits will tend to reduce measured resistance.

Conclusion

The test results indicate that the rope under test, when wound on an earthed steel core, is not capable of retaining sufficient electrostatic charge to produce hazardous discharges.

Other Considerations

The conclusion above is based on the results of measurements on the surface of the rope, which as reported is contaminated with materials that are likely to reduce the surface resistance. It is to be expected that the outer surface of the rope is likely to suffer such contamination over its entire length and that even the strands that remain inside the cross-section of the rope will be contaminated with salt deposits. Nevertheless, if there are significant areas of rope in which the surface is not contaminated, the conclusion may not apply. The results for the loose sample taken near the "burn end" of the rope do suggest that this area may not have been as heavily contaminated. Testing rope in an "as new" condition would help to identify the range of resistance for the rope in question. At the

time of writing, “as new” rope is not available for testing. Information as to which end of the rope is most likely to have been exposed to sea water is also not available at the time of writing this report.

If generation and retention of electrostatic charge on the rope remains a concern, textile technology exists that can help to reduce the generation of charge and can efficiently and safely dissipate any charge that is generated. Topical finishes applied to fibres or finished materials can be effective, but for marine ropes, they are unlikely to be resilient enough for long term use. A better alternative would be to use conductive or static dissipative yarns. Metals, metal alloys, metal oxides and carbon are used in the production of such yarns, which are widely used in many applications, including flexible intermediate bulk containers (FIBC), protective clothing, conveyor belts, carpets, car seats, etc. Normally only a small percentage of conductive or static dissipative fibre is required to provide protection against static electricity, and so they can be used quite freely without compromising the structural integrity of other properties of the material. Although not all conductive or static dissipative fibres are suitable for marine rope applications, there are several types that would be most suitable.

The tests carried out in this study have been used to determine if an electrostatic discharge from the rope may cause the ignition of a flammable atmosphere. There are other possible ways in which the rope can be the source of ignition, but which are not addressed by the present tests. One such possibility is that of a thermite reaction. Thermite is a pyrotechnic mixture of a metal, e.g. aluminium, magnesium, zinc, titanium, etc. and a metal oxide, e.g. iron oxide, copper oxide, etc. A rope contaminated on its surface with rust (iron oxide) may produce a thermite reaction if it rubs against a metal or metal alloy. Thermite reactions produce heat and often hot sparks that are a potential source of ignition.

Reported by: 

Dr Paul Holdstock.

Annex A – Photographs and Charts

Figure 1 – Rope sample wound on to steel flanged core.

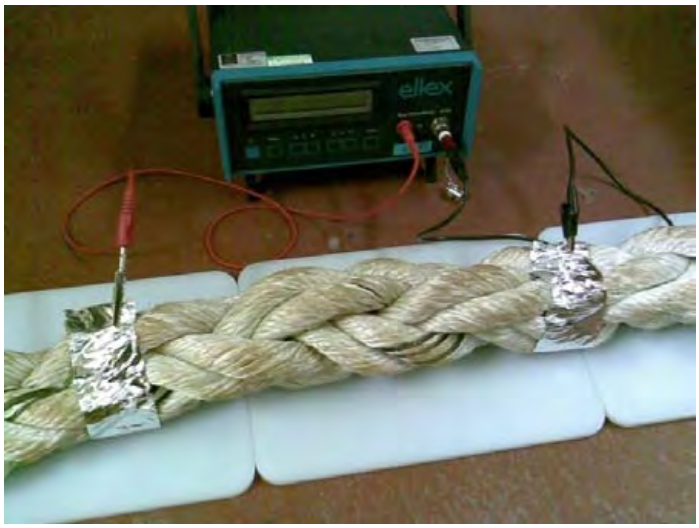

Figure 2 – Arrangement for measuring point-to-point resistance along rope.

Figure 3 – Arrangement for measuring point-to-point resistance along the rope.

Figure 4 – Arrangement for measuring charge decay time from the rope.

Figure 5 – Arrangement for measuring charge decay time from an insulating plastic plate.

Figure 6 – Arrangement for measuring charge transfer in any discharges from the rope.

The following charts show the data recorded during charge decay time measurements. As fieldmeters invariably suffer some degree of noise, recorded data is overlaid with a moving average to aid analysis and interpretation of results. The large amplitude oscillations represent the response to the fieldmeter caused by the carbon fibre brush, which is charged to -10 kV. The charge decay time analysis is taken from the data recorded immediately after these oscillations have ceased, i.e. when the carbon fibre brush has been removed from the measuring area.

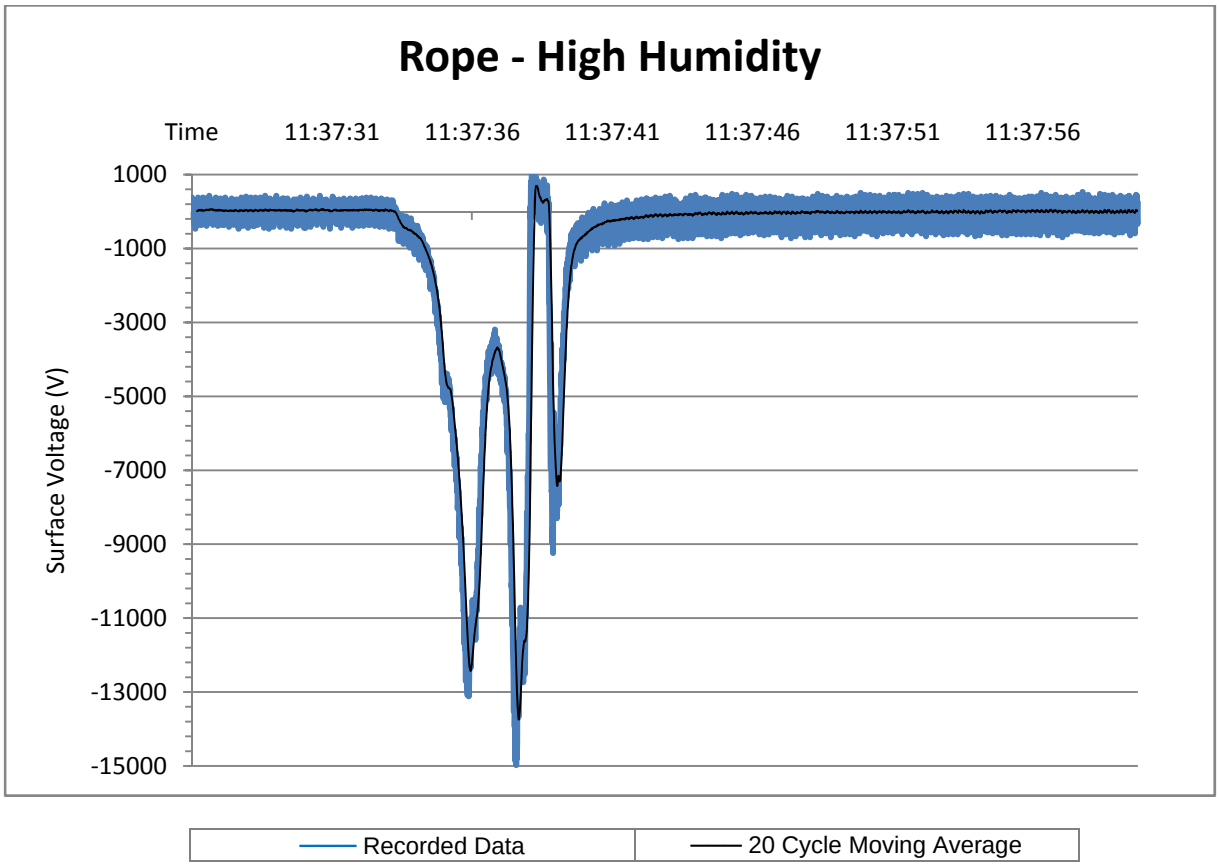

Figure 7 – Charging Decay for Rope at 65 % RH.

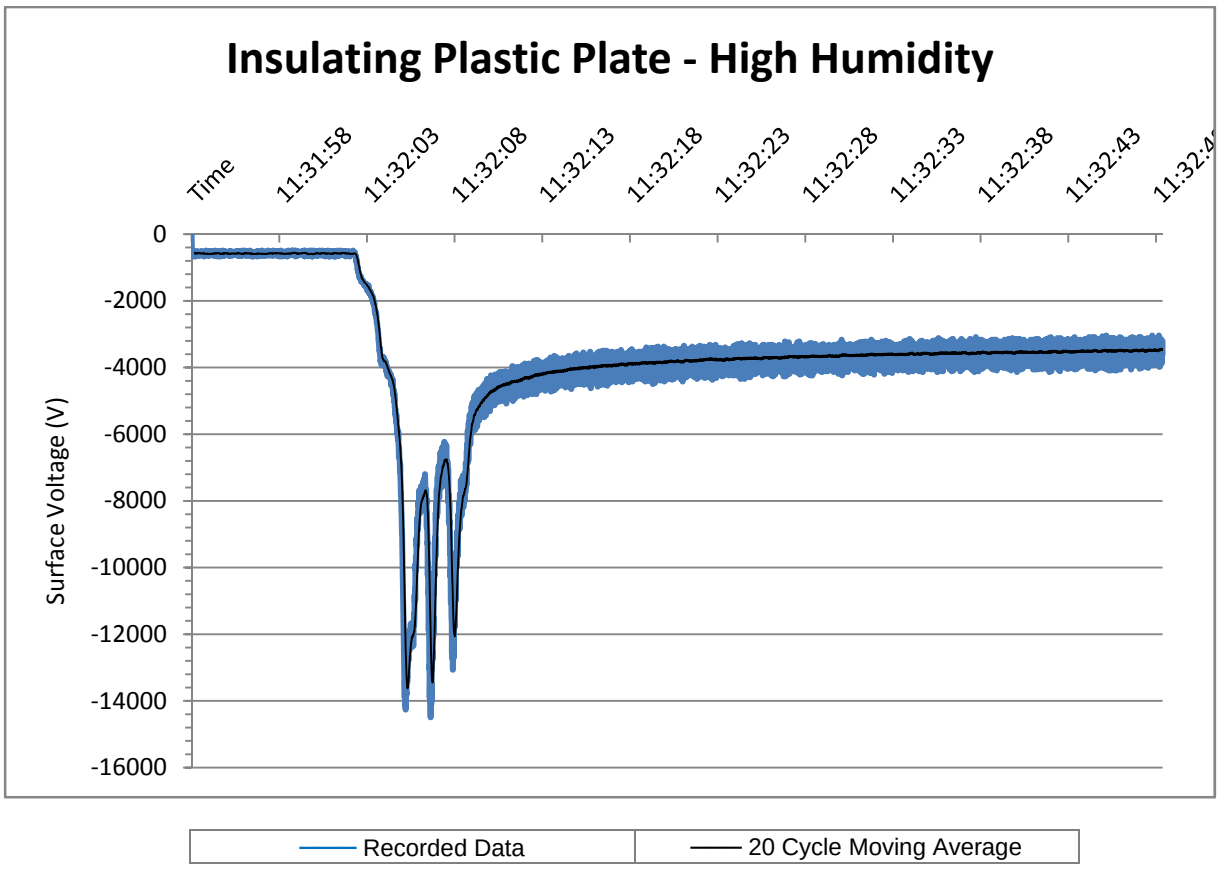

Figure 8 – Charge Decay for Insulating Plastic Plate at 65 % RH.

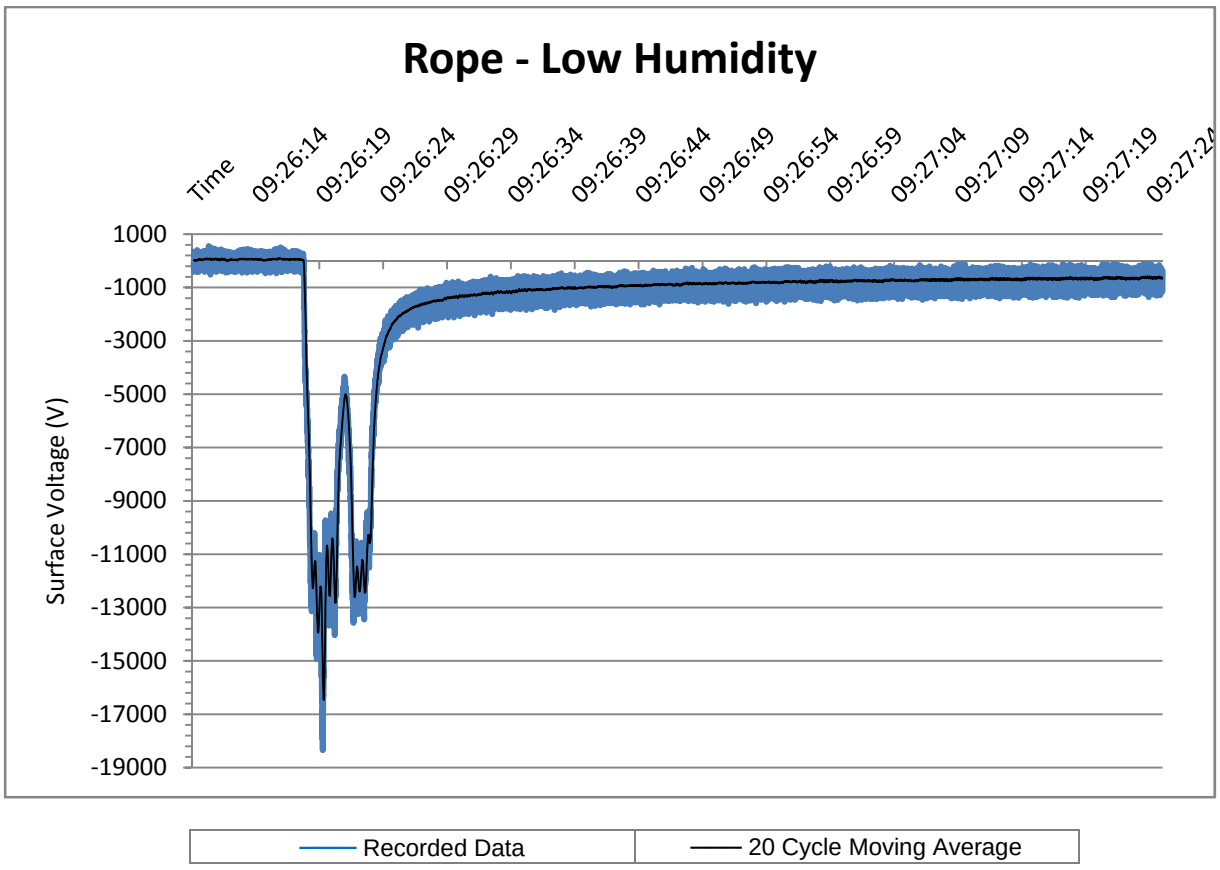

Figure 9 – Charging Decay for Rope at 25 % RH.

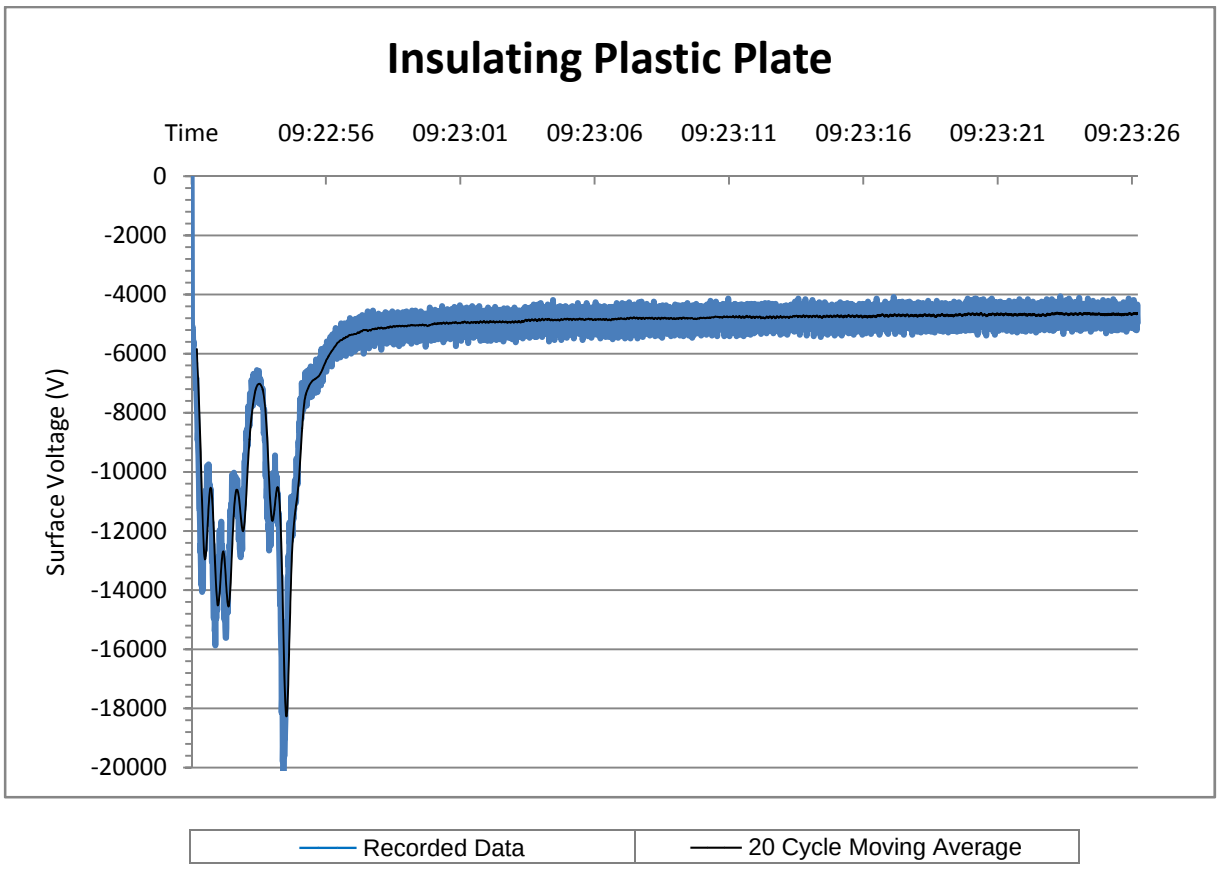

Figure 10 – Charge Decay for Insulating Plastic Plate at 25 % RH.

Annex P

Safmarine Nyassa's Report of Near Miss dated 26 October 2008

Report of Near Miss (Including Unsafe Act, Practice or Condition)

A.P.Moller Group ID:006 - 26/01/03 - 02

Vessel: **Safmarine Nyassa** Report No.: **9356086/006/08/4**

Description of Incident:

Incident Date:	**26-Oct-2008**
On Board:	**Forecastle**
Vessel Position:	**In open sea**
Weather:	**Moderate**
Activity:	**Other**

Vessel was heading into some moderate to heavy weather with some occasional pounding on our stbd shoulder during the night

The next morning we found that the Stbd anchor securing arrangement was lying loose down the hawse pipe. The anchor had not paid out, but it could have if the weather was worse causing a possible loss of the anchor

Our securing is a senhouse slip type arrangement. The small locking pin for the senhouse slip had sheared and caused the whole securing arrangement to come adrift.

Immediate Cause and Corrective Action

Main:	**Design weakness**
Wind:	**07 - Near Gale (28-33kn | 13.9-17.1m/s)**
Illumination:	**Not Relevant**
Duty:	

Immediate cause is an inadequate design.

What we propose is to bypass the senhouse slip and use a 8.5 ton shackle. This should be more than adequate, the anchor only weighs just shy of 7 tons.

We will remove unnecessary links and senhouse slip and also ensure the shackle pin is moused and properly secured.

The above pending TO approval and suggestions.

Please see attached pictures for clarification.

Corrective Action Allocated to: **Choff /Bosun** Date Corrective Action Completed:

Underlying Cause and Suggested Action:

Cause: **Environment**

Heavy weather stresses on the anchor arrangment causing the pin to shear.

Report of Near Miss (Including Unsafe Act, Practice or Condition)

A.P.Moller Group ID:006 - 26/01/03 - 02

Master: _____ _____ **26-Oct-2008**

(signature) (date)

Safety Officer: _____ _____

(signature)

RESPONSE:

Export Date:	**30-Oct-2008**	From:	
Origin of response:	**office**	Report Status:	**closed**

Thank you for this near miss report.
Believe discussed onboard the vessel with Fleet Technical Superintendent.
The small locking pin can be replaced with a better quality pin and securing arrangement not made too tight.
Vessel suggetion to bypass senhouse slip and use shackle also acceptable.
With nothing further this near miss now considered closed.

GSMS Section 3.16, Speed Reduction – ID 1377, dated 15 January 2005

GSMS

Apps home page

Editor.: Marine Dept| **Approver.:**Head of Marine Dept | **Released By.:**APMM TO Q-Manager | **Revision Date.:**15/01/2005 | **Revision Number.:**0 | **Document ID.:**1377

3.16 Speed Reduction

If heavy seas or swell is encountered, regard shall be given to the necessity of reducing speed or altering course in order to avoid damage to the vessel and her cargo.

Heavy Seas - Observation - Precautions

The risk of suffering damage increases when the length of waves, typically after a prolonged period of heavy weather, attains a length corresponding to the ships length. During gale conditions it is therefore important to carefully watch how the length and the height of waves increases.

When proceeding through waves with wave lengths corresponding to the length of the vessel and the trough of a wave is amidship the reduced buoyancy combined with vessel's speed will cause the bow to dive into the seaway and the crest of the advancing wave will break over the forecastle head, in exceptional cases at a speed of up to 50 knots plus the speed of own vessel.

In order to reduce this risk after a prolonged period of heavy weather consideration shall be given to alter course so that the vessel does not head directly into the sea.

References

Definitions

GSMS Section 4.6, Navigation in Adverse Weather – ID 1387, dated 20 May 2008

GSMS

Apps home page

Editor.: Marine Dept| **Approver.:**Head of Marine Dept | **Released By.:**APMM TO Q-Manager | **Revision Date.:**20/05/2008 | **Revision Number.:**1 | **Document ID.:**1387

4.6 Navigation in Adverse Weather

When encountering rough weather, heavy seas or swell, care shall be taken to avoid damage to the vessel and her cargo.

Especially during hours of darkness it may be difficult to the Officer of the Watch to evaluate the effect of heavy weather.

If vessels with powerful engines are proceeding too fast into a head-on sea the underside of the forward part of the vessel, after coming out of the water, will slam down onto the on coming waves with the risk of damaging the bottom of the vessel.

After a prolonged period of rough weather the wave length may attain a length corresponding to the vessel's length and when the midship section is in the trough, the crest of the oncoming wave may break over the bow with a speed of 50 knots plus the speed of the vessel.

Adverse Weather - Precautions

The risk of suffering rough weather damage shall be avoided and an alteration of speed or change of course or both may be the solution if circumstances so require.

In vessels with high GM encountering adverse weather with waves from abeam it may be considered to ballast the wing tanks with slack surface in order to reduce the GM and thereby reduce the violent rolling of the vessel.

Even for container ships equipped with, and using stabilisers it is an advantage to reduce the stability in order to gain longer rolling periods and thus minimise the stabiliser workload.

In vessels with stern construction having a flat bottom surface sea or swell slamming up under the flat stern of a vessel must be avoided by taking proper actions such as changing course and/or speed.

If the vessels is in light ballast condition it may be necessary to ballast as much as possible in order to obtain the best possible stability and draught in order to cope with heavy weather.

References

Definitions

GSMS, Heavy Weather Damage - ID 1148, dated 13 March 2007

GSMS

Apps home page

Editor.: Marine Dept| **Approver.:**Head of Marine Dept | **Released By.:**APMM TO Q-Manager | **Revision Date.:**13/03/2007 | **Revision Number.:**1 | **Document ID.:**1148

Heavy Weather Damage

When a vessel encounters heavy weather, care shall be taken to avoid/minimize damage to the vessel, her crew and the cargo.

Heavy Weather Damage Report

When heavy weather damage is sustained the Master shall report the casualty to Technical Organisation/Management stating replies to the following questions. The questions shall be quoted along with the reply.

1. Date/Time when damage occurred (Indicate time zone).
2. Name of person in Technical Organisation/Management contacted
3. Position, en route from/to.
4. Duration of storm.
5. Day or night.
6. Transverse Metacentric Height, GM_t
7. Vessels draft.
8. Main engine power (BHP) and revolutions (RPM).
9. Speed.
10. Course.
11. Swell height
12. Swell direction.
13. Sea height.
14. Sea direction.
15. Pitch or slamming observed to: Slight / Medium / Heavy.
16. Max roll angle observed.

17. Finn Stabilizers: available/functional/used
18. Wind force.
19. Wind direction.
20. Bridge manned by.
21. Variance between computer based weather advisory programs and actual conditions
22. Weather-routed, any deviation from recommended route.
23. The extent of damage to vessel and equipment as detailed as possible.
24. Is urgent assistance for repair needed?
25. Damage to cargo observed or suspected.
26. Has cargo been lost? Affirmatively, was dangerous cargo involved, and to which authorities has it been reported?
27. Lesson to be learned, incl. consideration of mitigating measures taken.
28. Confirm that Heavy Weather checklist ID 416 has been completed and a copy attached to this mail.

In container vessels Marine Protest are to be lodged in next port.

In other types of vessels, the Master will be requested to lodge Marine Protest, if deemed necessary by CPH.

In case of severe damages to the vessel or cargo - or if weather conditions are preventing thorough access of the damages - a follow-up report must be submitted.

References

Definitions

Heavy Weather Checklist – ID 416, dated 18 September 2007

MAERSK

Checklist - Heavy Weather

A.P.Moller Group ID:416 - 18/09/2007 - 02 - 6 months

Vessel: **Maersk Newport** Date: _____

A vessel specific heavy weather checklist shall be available onboard all vessels to facilitate an efficient "making ready for sea" check on departure from port, bound for an ocean passage, when expecting adverse weather between coastal ports, or when the weather detriorates while on route the inclusion of items below shall be considered and the shipboard management shall, thoroughly and well in advance, compose their own checklist with all appropriate check items

Item	
Weather routing and forecasts scrutinised	☐
Heavy Weather maneuvering characteristics known and consulted	☐
Personnel instructed and familiar with available means for heavy weather response	☐
Loading condition - (e.g. GM, stress, tank shoshing, immersion of propeller, freeboard)	☐
Container stacking adjusted for ocean passage	☐
Container lashings rechecked/ tightened	☐
Hatchcover locking devices rechecked	☐
Anchors properly lashed and brakes engaged	☐
Dampers for ventilation on forecastle closed	☐
Ventilation for bowthruster closed	☐
Dampers for ventilation of cargo holds closed (reefer cargo holds exempted)	☐
Lashings on mono-rail crane rechecked	☐
Stores, equipment etc. stowed on deck secured	☐
Store room forward checked and additional lashings applied as necessary	☐
Paint locker checked and all paint secured	☐
Steering gear room checked and additional lashings applied as necessary	☐
Engine room checked and additional lashings applied as necessary	☐
Watertight doors closed	☐
Portable gangway properly secured	☐
Pilot ladders and hoists properly secured	☐
Chief Steward notified and provision room and gallery prepared for rough weather	☐
Furniture and appliances in Dining Saloon secured	☐
Furniture and appliances in Duty Mess secured	☐
Furniture in Officers Smoking Room secured	☐
Furniture in Crew's Dayroom secured	☐
Furniture in Conference Room secured	☐
Additional lashings on PC monitors, copy machines and printers	☐
Deck control room prepared for rough weather	☐
Bridge prepared for rough weather	☐
If rolling exceeding 30 degrees the engine room to be manned	☐
Crew instructed about any restrictions in work outside accommodation	☐
	☐
	☐
	☐

Master: _____ _____

(signature)

Annex U

Technical Vessel Operations Container Fleet Group Manager's e-mail dated 24 November 2008 – casualty on board *Maersk Newport*

From:

Sent: 24. november 2008 16:09

To: Maersk Newport (Line)
Maersk Norfolk
Maersk Newbury

CC:

Assignee(s):

Keyword(s): newport;casualty

Attachment(s): pin.JPG; Microsoft PowerPoint - Maersk Newport hull and fire.pdf

REFN: JPH1453368

Subject: **Casualty onboard Maersk Newport [Our Ref:JPH1453368]**

Dear All

As you properly have heard has there been a casualty onboard Maersk Newport. The anchor lowered it self in heavy weather due to poor design of the chain lashing. We kindly ask you to change this design by drilling a hole in the securing pin (see picture "pin") and secure the pin with a split pin or a Linch pin (A/N 326551). Please confirm once you have modified both chain lashings.

Have also enclosed a Powerpoint of the casualty and fire onboard.

Do not hesitate to revert if any questions.

Yours faithfully
for A.P. MOLLER

Technical Vessel Operation Container
Fleet Group Manager
A.P. Moller - Maersk A/S
Esplanaden 50
DK-1098 Copenhagen K
Reg. no: 22756214
Phone: [redacted]
http://www.maerskline.com

Annex V

Technical Flash 04/2009 – Loss of Anchors, dated 2 January 2009

TECHNICAL FLASH 04/2009

Loss of Anchors

Issued by: TOOPSNAU / SQHE Department, Copenhagen

MAIN CAUSE:

As previously outlined in Technical Flash (TF) 6/2006, we draw your attention to the fact that improper lashing/operation of anchors often leads to loss of the anchor. After TF 6/2006 was released, the frequency of mishaps decreased, but four recent incidents indicate that the improvement has come to an end and the issue needs to be readdressed.

In 2006 two common root causes leading to loss of anchors and chains, were detailed;

- insufficient securing of the anchor, or
- failure of the brake when dropping the anchor

The corrective actions to the above are now implemented in Guidelines for Navigators §4.2 "Anchoring and Use of Anchors".

The recent incidents however involve yet another root cause;

- operational failure

DESCRIPTION:

When in approaches, channels etc. after having lowered the anchor to just above the water, keeping it ready to fall, the windlass brake should be engaged and the clutch should be disengaged. Otherwise, if the hydraulics are stopped, the weight of the anchor and chain may pull the hydraulic motor backwards, resulting in damage to the gear.

Similarly, if an anchor is walked out in deep water, it should be stopped before reaching the bottom. Otherwise, swell and vessel's movements may cause sudden strain on the chain, which may pull the hydraulic motor backwards, resulting in damage to the gear.

It has been noted that during most occasions when loosing an anchor system, the brakes appear to be insufficiently tightened and/or poorly adjusted. Therefore, the periodical maintenance system on board should also describe in detail:

- How to adjust the windlass brakes - or at least refer to the appropriate paragraph in the operations manual.
- A systematic check to ensure that all security pins are available and in good order.

CORRECTIVE ACTION:

All vessels are kindly requested to create a training exercise based on the present TF 4/2009, the above mentioned TF 6/2006 and TF 2/2008 "Emergency Towing".
Particular focus should be given to inexperienced personnel - during the exercise as well as during normal job training, e.g. by participation as observers rather than carrying out a job without prior experience.
Please submit a copy of the scenario/review to our drill address CPHTECHDRL along with a copy and specific reference to the appropriate documentation describing adjustment of windlass brakes – incl. Service Letters, if available.