Annex A

Hotwork request No 15/10 for SUS hopper repair, dated 2 July 2010 and associated Safety Action Plan and risk assessment

mv Yeoman Bontrup - Hot work request - 0207

From:	Yeoman Bontrup
To:	[redacted]@vships.com
Subject:	mv Yeoman Bontrup - Hot work request - 0207
Sent:	02/07/2010 06:18:00 +00:00
Attachments:	1. SAF 03 Hardox, Shute.doc 2. Safety Action Plan-Hardox.doc

Good morning,

Please authorize the following hot work No.15/10

a) Hot Work 15/10.

b) Risk Assessment 15/10

c) Hardox plates repair

d) Equipment: Electrical welding and gas burning equipment.

e) Upper Deck, Lift Shute.

Constant fire watch will be exhibited.

With Best regards

[redacted]

Mob. phone: [redacted]

Sat/F Phone: [redacted]

Sat/F Fax: [redacted]

Sat/C Tlx: [redacted];

[redacted]

E-mail: [redacted]

m/v Yeoman Bontrup Date: 02.07.2010

SAFETY ACTION PLAN
REQUIREMENTS AND PRECUATIONS

A) Nature of the job
Hardox plates replace in the lift chute.
B) Job description
Hardox plate party: replacement and repair.
C) Fire Fighting measures
Portable fire extinguishers, fire hoses to be available at work place
Fire hoses shall be fully charged and the main fire pump operating at all times.
The portable foam system shall be immediately ready for use. The rubber belt should be covered – protected by non combustible materials (fire blanket).
The working place should be free of any combustible materials and tidy.

A FIRE WATCH WILL BE MAINTAINED CONTINUOUSLY AT WORK PLACE DURING THE JOB, DURING ANY BREAKS AND 60 MINUTES AFTER THE HOT WORK HAS BEEN COMPLETED.

D) Technical measures
The main power to the SUS and all hydraulic pumps should be switched off and disconnected; lock-out / tug-out poster should be posted.

E) General measures
Permit to hot work and risk assessment to be issued before starting the work. A brief safety meeting is to be held before work commences to discuss all safety measures. All personnel involved in the hot work shall attend, including all those given safety or monitoring duties.
Communications within the vessel shall be kept at all times for hot work.
Application of all these specific procedures and the vessels internal ISM procedures will be reviewed by the safety officer (Chief Officer) before any work will be approved by the Master to start or to continue.
The Master remains responsible for ensuring that all safety action are being implemented throughout entire hot work operation.

Safety Officer _____ [redacted](Ch. Officer)

Chief Engineer_____ [redacted]

Master _____ [redacted]

DETAILED RISK ASSESSMENT **SAF03**

Ship's Name: YEOMAN BONTRUP Record Number: 15/10

Current Assessment Date: 02/07/10 Last Assessment Date:

Work Activity Being Assessed: Hardox plates repair of lift Shute

Section 1

Hazard Analysis of the Intended Work Activity

Hazard No:	Description of Identified Hazards:	Existing Control Measures to Protect Personnel From Harm
1.	Electrical shock	The work area shall be dry and all electrical welding equipment securely Earthed
2.	Fire of neighbour isolation materials	All neighbour isolation materials to be flame/sparks protected.
3.	Presence of any material likely to give off flammable vapours	Surrounding area shall be checked with regard to combustible flammable materials and gases before commencing of work
4.	Fire of neighbour conveyor belts	All neighbour to be flame/sparks protected.
5.		(a) (b) (c)
6.		(a) (b) (c)
7.		(a) (b) (c)
8.		(a) (b) (c)
9.		(a) (b) (c)
10.		(a) (b) (c)

*** The primary means of reporting is via Shipsure Risk Assessment database. This form is only to be used when Shipsure is inoperative.**

SECTION 2

Assessment of Risk Factor

Likelihood	Severity					
	Minor	Moderate	Severe	Major	Critical	Disastrous
Highly Likely	Medium	Medium	Significant	High	Very High	Very High
Likely	Medium	Medium	Significant	High	High	Very High
Occasional	Low	Medium	Significant	Significant	High	High
Remote	Low	Medium	Medium	Significant	Significant	Significant
Unlikely	Very Low	Low	Medium	Medium	Medium	Medium
Very Unlikely	Very Low	Very Low	Low	Low	Low	Medium

To assess the risk factor arising from the hazard:

1. Select the expression for likelihood which most applies to the hazard;
2. Select the expression for severity of harm which most applies to the hazard;
3. Cross-reference using the Risk Estimate table (above) to determine the level of risk;
4. If the Risk Factor is MEDIUM or above (yellow, orange or red) additional control measures should be implemented and recorded in Section 3

Hazard No:	Likelihood of Harm	Severity of Harm	Risk Factor
1.	Unlikely	Moderate Harm	Low
2.	Unlikely	Moderate Harm	Low
3.	Unlikely	Moderate Harm	Low
4.	Likely	Minor	Medium
5.			
6.			
7.			
8.			
9.			
10.			

*** The primary means of reporting is via Shipsure Risk Assessment database. This form is only to be used when Shipsure is inoperative.**

SECTION 3

Additional Control Measures to Reduce the Risk of Harm

Hazard No:	Further Risk Control Measures	Remedial Action Date	Review Date
1.	Check and clean the working area, FFA should be engaged and ready for use, rigged fire hose should be rigged and ready for immediate use.	02/07/2010	
2.	Control for checking of working equipment, cables, connections, hoses before start work.	02/07/2010	
3.	Proper control for wearing of protective clothing, goggles, gloves, welding masks.	02/07/2010	
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Additional Comments:
Portable fire extinguishers, fire hoses to be available at work place
Fire hoses shall be fully charged and the main fire pump operating at all times.
The isolation materials should be covered – protected by non-combustible materials (fire blanket). The working place should be free of any combustible materials and tidy.

Assessment Review Date: **02/07/10**

*** The primary means of reporting is via Shipsure Risk Assessment database. This form is only to be used when Shipsure is inoperative.**

Annex B

Hotwork request No 16/10 for No 4 WBT repair, dated 2 July 2010

mv Yeoman Bontrup - Hot work request - 0207

From:	Yeoman Bontrup
To:	[redacted]@vships.com
Subject:	mv Yeoman Bontrup - Hot work request - 0207
Sent:	02/07/2010 07:53:32 +00:00
Attachments:	1. SAF 03 SWBT 4 strd.doc 2. Safety Action Plan-Fracture repair in SWBT 4 stbd.doc

Good afternoon,

Please authorize the following hot work No.16/10

a) Hot Work 16/10.

b) Risk Assessment 16/10

c) Bulkhead fracture repair.

d) Equipment: Electrical welding and gas burning equipment.

e) SWBT 4 strd lower hopper.

Constant fire watch will be exhibited.

With Best regards
Master of mv "Yeoman Bontrup"
[redacted]

Mob. phone: [redacted]
Sat/F Phone [redacted]
Sat/F Fax: [redacted]
Sat/C Tlx: [redacted]
[redacted]
E-mail: [redacted]

Annex C

Silometer handbook – Safety Instructions, Safety Instructions for Operation and Endress + Hauser Service Report dated 18 March 2002

Safety Instructions

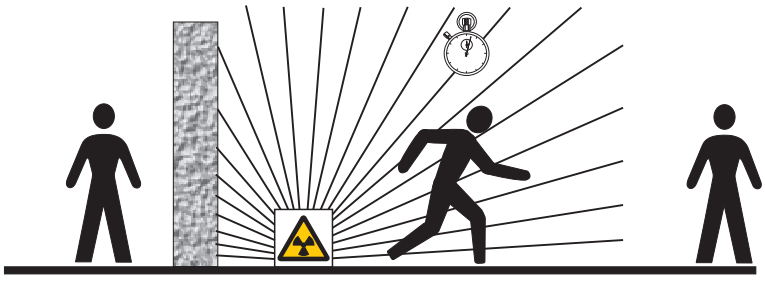
Basic Instructions for Use and Storage

- Observe the applying rules and national/international regulations.
- Observe the radiation protection regulations in use, storage and for work on the radiometric measuring system.
- Observe warning signs and safety areas.
- Install and operate the device according to the manufacturer's instructions.
- The device shall not be operated or stored outside the designated parameters.
- Protect the device against extreme influences (i.e. chemical products, weather, mechanical impacts, vibrations) when operated or stored.
- Always safe the position of the source insert using the lock or padlock.
- Do not operate or store damaged or corroded devices.Contact the responsible radiation protection officer for appropriate instructions and measures when damage or corrosion occurs.
- Conduct the required leak testing procedure according to the applying regulations and instructions.
- If the instrument is exposed to vibrations or mechanical impacts, the safety pin can become abraded. If no padlock is used, this may lead to a loss of the source holder. Therefore, stability and tightness of the source holder must be checked in regular intervals (see page 7).

Caution!
In case of doubt about proper condition of the device check the area around the device for leakage radiation and/or contact immediately the responsible radiation protection officer.

General instructions on radiation protection

When working with radioactive sources, any unnecessary exposure to radiation must be avoided. Unavoidable exposure to radiation must be kept to as low a level as possible. Three important measures help you achieve this:



Screening
Ensure the screening between the radiation source and you and all other persons is as good as possible.
Source containers (e.g. QG 020/100) and all high-density materials, (lead, iron, concrete etc.), can be used for effective screening purposes.

Time
Time spent in the exposed area should be kept to a minimum.

Distance
Keep at as large a distance as possible from the radiation source.
The local dose rate of the radiation decreases with the square of the distance from the radiation source.

Safety instructions for switching on the radiation

- Before switching on the radiation, ensure that no-one is in the range of radiation or within the product container.
- The radiation may only be switched on by instructed personnel.

Safety Instructions for Operation

Servicing and Inspection

In designated use, operated under the specified ambient and operation conditions, no inspection or servicing of the device is required.
If nevertheless inspection is considered as necessary - i.e. within the framework of routine inspections of the installation or because the installation is exposed to vibrations or mechanical impacts - following checks are recommended on demand:

- visual check regarding corrosion of housing, weld seams, outer parts of source insert, lock/ padlock
- check of the movability of the source insert (on/off function)
- visual check of the readability of the labels and the condition of the warning symbols.
- for vibrations and mechanical impacts: check of the stability and tightness of the source holder

Country specific regulations may require frequent inspections of the radiation source container. For the Chemical Design of QG 020 and QG 100 the inspection periods may be extended up to 15 years according to a PTB statement. In order to examine the state of the sealing material a reference O-Ring of the same material is fixed to the rotary bracket (see page 14).

Caution!
If there is any doubt about correct function or proper condition of the device contact immediately the responsible radiation protection officer for advice.

Safety instructions for changing the radiation source

- All maintenance work, such as removing or replacing the radioactive source, may only be carried out by authorised, supervised, specialised personnel in accordance with local legislation or the handling permit. Ensure that such work is permitted by the handling permit. All local factors must be taken into account.
- All work may only be performed from a protected position, (screening!). Take appropriate measures to avoid endangering other persons (e.g. cordoning off area etc.).
- Prepare in detail to ensure that the radiation source is replaced as fast as possible. Make sure the tools and resources required (screened container for replaced source etc.) are at the ready before commencing the task.
- When changing the source, strictly observe all instructions given in this manual.

(1)

Service Report

Endress + Hauser

Endress + Hauser Ltd • Floats Road • Manchester • M23 9NF • Tel 0161 286 5000 • Fax 0161 368 1041

VAT Registration No. 148 1934 64
Terms: Strictly Nett 30 days

Contract No. TA

Invoice Address:

Contact: Phone No: Fax No:

Deliver / Site Address:
YEOMAN BRIDGE
ISLE OF GRAIN.

Contact: Phone No.

Date of Work:

Reported Fault:
CARRY OUT WIRE TESTS

PO No:

Field Service Error Code: Instrument Type	Serial No.
FTG 470 Z	

Report: CARRIED OUT WIRE TESTS ON RADIO ACTIVE SOURCES FITTED TO PORT AND STARBOARD DISCHARGE CHUTES TEST RESULTS TO FOLLOW AFTER ANALYSIS.

RADIATION LEVELS

MAXIMUM RADIATION LEVEL OBTAINED AT SURFACE OF SOURCE HOLDERS FOUND TO BE 140 MICRO SIEVERTS PER HOUR.

MAXIMUM RADIATION OBTAINED AT WALKWAY HAND RAIL 2.5 MICRO SIEVERTS PER HOUR

MAXIMUM RADIATION OBTAINED AT STAIR WELL 1.5 MICRO SIEVERTS PER HOUR

Part	Unit Price	Extended price
		£

Parts brought across £

Time in E + H Workshop hrs

Arrival Time hrs

Departure Time hrs

Time Travelling hrs

Total hrs at £

Mileage at £

SUBSISTENCE TOTAL £

[redacted]

Job Completion Date: 18/1/12

Customer Signature:

Print Name:

[redacted]

(2)

Service Report

Endress + Hauser

Endress + Hauser Ltd • Floats Road • Manchester • M23 9NF • Tel 0161 286 5000 • Fax 0161 998 1841

VAT Registration No 146 1938 84
Terms: Strictly Nett 30 days

Contract No TA

Invoice Address:

Delivery / Site Address:
YEGMOUTH BRIDGE
ISLE OF GRAIN

Contact | Phone No / Fax No

Contact | Phone No

Date of Work

Reported Fault:
FROM N° 1

PO No

Field Service Error Code / Instrument Type | Serial No.

Report: I THEREFORE RECOMMEND THAT ACCESS TO THE WALKWAY IS RESTRICTED AND/OR THE SOURCE HOLDERS ARE FITTED WITH A GUARD TO ENSURE IT IS NOT POSSIBLE FOR PERSONNEL TO PASS ANY PART OF THEIR BODY IN THE PATH OF THE RADIATION.

I WOULD ALSO RECOMMEND THAT IF ANY WORK IS TO BE CARRIED OUT IN THE CHUTE THAT THE SOURCE IS SWITCHED OFF

Part	Unit Price	Extended price
		£

Parts brought across £

Time in E + H Workshop hrs

Arrival Time hrs

Departure Time hrs

Time Travelling hrs

Total hrs at hrs £

Mileage at £

SUBSISTENCE TOTAL £

[redacted]

Job Completion Date
18/3/02

Customer Signature

Print Name

[redacted]

Annex D

Castrol Hyspin AWH-M15 – material safety data sheet

Castrol (U.K.) Limited

The Leading Lubrication Specialist

SAFETY DATA SHEET

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

Product Name: **Hyspin AWH-M 15** Code: **6152-UK**

Application: Hydraulic systems.

Company: **Castrol (U.K.) Limited**

Address: Burmah Castrol House, Pipers Way, Swindon, Wiltshire, SN3 1RE

Telephone (24 hours): **01793 512712** Fax: 01793 491442

2: COMPOSITION/INFORMATION ON INGREDIENTS

Composition: Highly refined mineral oil and additives.

Hazardous Ingredient(s)	Symbol	Risk Phrases	Other Information	%
This product contains ingredients classified as hazardous. However, they are NOT present in sufficient quantities to warrant classifying the product as hazardous.				

All constituents of this product are listed in EINECS (European Inventory of Existing Commercial Chemical Substances) or ELINCS (European List of Notified Chemical Substances) or are exempt.

Refer to Section 8 for Occupational Exposure Limits.

3: HAZARDS IDENTIFICATION

This product is NOT classified as hazardous.

4: FIRST AID MEASURES

Eyes: Irrigate immediately with copious quantities of water for several minutes.

Skin: Wash thoroughly with soap and water or suitable skin cleanser as soon as possible.

Inhalation: Remove from exposure.

Ingestion: Obtain medical attention. Do NOT induce vomiting.

5: FIRE FIGHTING MEASURES

Suitable Extinguishing Media: Carbon dioxide, powder, foam or water fog - Do not use water jets.

Special Exposure Hazards: None.

Special Protective Equipment: None.

6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Spilt product presents a significant slip hazard.

Environmental Precautions: Prevent entry into drains, sewers and water courses.

Decontamination Procedures: Soak up with inert absorbent or contain and remove by best available means.

7: HANDLING AND STORAGE

Handling: When used in high pressure systems, leakage may result in mist formation so presenting a hazard. To avoid the possibility of skin disorders, repeated or prolonged contact with products of this type must be avoided. It is essential to maintain a high standard of personal hygiene.

Storage: No special precautions.

8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits:-

Substance	8 Hr.TWA	STEL	Source/Other Information
Mineral oil (see Oil mist, mineral)	5mg/m^3	10mg/m^3	EH40 (OES)

Engineering Control Measures: Mechanical methods to minimise exposure must take precedence over personal protective measures.

Personal Protective Equipment: Avoid skin and eye contact. Wear impervious gloves (eg of PVC), in case of repeated or prolonged contact.
Change contaminated clothing and clean before re-use.

9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Colour:	Amber
Odour:	Mild
Boiling Point/Range (°C):	Above 250
Pour Point: (°C):	Below minus 51
Kinematic Viscosity @ 40°C (cSt):	15
Flash Point (closed, °C):	Above 140
Autoignition (°C):	Above 250
Explosive Properties (%):	Explosive limit range (%): 1 - 10
Vapour Pressure (kPa at 20°C):	Below 0.1
Relative Density (at 20°C):	Below 1.0
Water Solubility:	Insoluble
Fat Solubility:	Not determined

10: STABILITY AND REACTIVITY

Stability:	Stable, will not polymerise.
Conditions to Avoid:	Temperatures (°C) above 90.
Materials to Avoid:	Strong oxidising agents.
Hazardous Decomposition Products:	None.

11: TOXICOLOGICAL INFORMATION

The following toxicological assessment is based on a knowledge of the toxicity of the product's components.
Expected oral LD_{50}, rat > 2g/kg.

Health Effects

On Eyes: May cause transient irritation.

Annex E

VMS – Self-unloading Section – Sections 4.5.5 – Prevention of Conveyor Belt Fires and 4.5.6 – Dealing with Conveyor Belt Fires

4.5.5 Prevention of Conveyor Belt Fires

Prevention of fire by safe practices is of utmost importance. Absolutely NO SMOKING is allowed in the Loop and Tunnel. Fire patrols are to be maintained in the Loop and Tunnel to ensure that there is no evidence of any possible source of fire. The three senses of sight, smell and hearing are to be used.

During discharging, when all the machinery is running, check the following:

- For overheating of any bearings or rollers.
- For Hydraulic leaks.
- That belts are running normally, and not slipping at the pulleys
- For oily rags, waste etc.
- That Tunnel exhaust fans are operational.
- That the belt is not rubbing against any build-up of cargo spillage.
- For noise or squeaking from bearings, or any smoke.
- That the electrical panels are guarded from cargo dust.
- That no person is carrying out an unsafe act.
- That all fire and water tight doors leading to SUL spaces are kept closed.

Fires in the Loop and Tunnel areas are very dangerous, as the conditions are conducive to its rapid spread, and also that they are in the vicinity of highly flammable areas, such as oil tanks, rubber belts, hydraulic oil, and the hold plastic lining.

The following safe practices must be exercised when carrying out hotwork in the Tunnel:-

- Complete the hot-work permit procedure and checklist, Form SAF 04
- Trip the emergency switch in the vicinity, and isolate/lock-out the machinery.
- Protect the conveyor belts, hydraulic piping, wiring and electrical components.
- Keep away from the fuel tanks.
- Avoid any heat coming directly in contact with the hopper side, as this will burn the UHMW lining in the hold.
- Wear protective clothing.
- Run the Tunnel exhaust fans.
- Keep fixed fighting appliance in readiness.

Maintain checks and fire patrol up to six hours after completion of hot work.

NOTE: WHEN PERFORMING HOTWORK ON THE UNLOADING GEAR, A FIRE OR WASH-DOWN HOSE UNDER PRESSURE MUST BE AT THE WORKSITE WITH ONE MAN PRESENT AS A FIRE WATCHMAN ONLY. THE FIRE WATCH IS TO BE MAINTAINED DURING COFFEE AND MEAL BREAKS. THE FIREWATCH MUST BE MAINTAINED FOR 60 MINUTES AFTER HOTWORK IS COMPLETED.

4.5.6 Dealing with Conveyor Belt Fires:

Rubber belt fires are highly toxic and acrid, and SCBA are to be worn to fight the fire. If the fire becomes unmanageable the space must be evacuated, and the shore fire brigade contacted immediately.

- Do not stop the belt if it catches fire.
- Train fire hoses on the running belt at intervals
- Start the Loop sprinkler.
- Shut the gates and stop the gate pumps.
- Fire extinguishers may only douse the fire, and water must be used to ensure that the fire has been completely extinguished.
- Tunnel exhausts fans must be kept running initially to reduce the toxic smoke, but stopped when entry is made using SCBA.

- Ensure that gas bottles have been removed from the vicinity of the fire.
- Hose down the seat or cause of fire, e.g. overheated bearing etc.
- Maintain a headcount check.
- Evacuate the area, and seal the exits if fire fighting efforts prove insufficient. (Note: The Loop house acts as a high riser encouraging the fire.
- Always maintain telephone contact with the port or local fire brigade.

After evacuation of the Tunnel and Loop, extinguishing the fire by using spray nozzle hoses from outside, or flooding the Tunnel will be required. Masters are required to calculate the vessels stability assuming the tunnel is flooded at various levels, and has a free surface over the entire area. The assumption that a few ballast tanks are slack with cargo full, and part full, should be made.

4.5.7 Enclosed Space Entry:

You are to refer to the Safety and Form sections for the relevant procedures and Company forms, see Form SAF 11. The SUL Tunnel is to be considered an Enclosed Space during the carriage of coal or similar cargoes.

4.5.8 Precautions in the Carriage of Coal:

Reference must be made to the IMDG and BC codes. Restricted entry into the cargo Tunnel and enclosed space procedure must be carried out prior to entry. Exhaust ventilation to the Tunnel is to be kept running weather permitting.

4.5.9 Preventing/Dealing with Spillage's and Overloads:

It is absolutely essential to avoid any spillage, and belt overload by taking the following measurements and precautions:-

- Correct training and belt tensioning.
- Adjustment of scrapers.
- Proper control of cargo flow onto the belt.
- Maintaining proper hydraulic line pressures on the gates.
- Careful monitoring of the belt load meter settings in the CCR when operating at maximum capacity.
- Frequent inspection of the system to identify any malfunction.
- Maintaining a shore hopper/boom watch to prevent overloading the shore system.

CAUTION: WHEN REMOVING SPILLAGES CLEAR OF THE BELT THE SYSTEM EMERGENCY STOPS MUST BE ACTIVATED AND THE BACKSTOPS ENGAGED AND CHECKED. THE OPERATION MUST BE CONTINOUSLY SUPERVISED BY A COMPETENT PERSON.

ENSURE THAT THE LIFT BELT BACKSTOPS ARE ENGAGED BEFORE CARRYING OUT ANY WORK IN THE VICINITY OF THE LIFT BELT AND ITS PULLEY/WHEELS ETC.

4.5.10 Cargo on the Return Belt

When spillage occurs or pieces of cargo bounce off the carrying side of the hold conveyor belt and falls onto its return side, this cargo will get in between the carriage components and **cause damage to them**. Proper control of the cargo flow onto the belt and good belt tracking will prevent this occurrence. If spillage occurs, the hold conveyor must be stopped, using the pull chord to clear the spill.

Annex F

VMS – Section 4.6.7 Hotwork

a) Isolate that part of the system to be worked on by closing the appropriate valves, open bypasses where fitted.

b) Ensure that isolating valves are secured in position and suitably labelled to avoid them being inadvertently opened (see lock-out/tag out procedures).

c) Open all drain cocks and vents to ensure the pressure is off the system.

d) Stand clear of the path that will be followed by the release of any residual pressure in the system.

e) Only slacken nuts and bolts before breaking joint. Do not completely remove them.

f) Ensure ventilation of area is adequate and if required, ventilate opened pipes before work.

g) Wear the appropriate protective clothing for the work being carried out. Boiler suits, socks and working shoes/boots should always be worn, in addition when work is being carried out above head height, a safety helmet and goggles must be worn.

h) Ensure that all valves and pipes are re-secured properly on completion of work.

When the checklist is completed by the Officer carrying out the work it is to be submitted to the Chief Engineer for verification and signature and then the Master for his signature. No work can commence until the permit has been signed by the relevant officer, the Chief Engineer and the Master.

A copy of the work permit is to be posted in the vicinity of the working area and on completion of the work and cancellation of the permit, the completed permit is to be retained on file by the Master.

4.6.7 Hotwork

Return to 4.4.3

a) General

Return to 4.4.4

Hotwork is any work involving an operation that may produce an incendiary spark. Any hotwork carried out outside of the engine room workshop must take into account the possible presence of flammable vapours, especially hydrocarbons and the existence of potential ignition sources. Hotwork is only to be carried out outside of the engine room workshop when no other reasonable means of repair or maintenance is possible.

As well as the Company procedures, all international, national, port and terminal regulations are to be followed as applicable. *Tankers must also to refer to the relevant chapters of the latest edition of ISGOTT*.

b) Categories

The following are all categories of hotwork:

Category	Type of Hotwork
1.	Welding
2.	Burning
3.	Naked Flame
4.	High Temperature
5.	Arc or Continuous Spark
6.	Use of non-intrinsically safe electrical equipment
7.	Work on electrical circuits (NB Also see SAF 08 Permit to Work on Electrical Circuits)
8.	Drilling

9. Grinding
10. Metal chipping (e.g. using hammer and chisel to remove seized nuts)
11. Blasting (including grit and sand but excluding high pressure water blasting)
12. De-scaling*
13. Paint chipping*
14. Scraping*

Note that categories marked with * do not apply to areas within machinery spaces except where such work is in or adjacent to a space containing flammable vapours.

The following categories of risk areas are to be used in conjunction with the above in determining the requirements for hotwork permits.

Risk Area A (Tankers and other vessels carrying dangerous cargoes):

All areas and spaces outside the engine room workshop

Risk Area B (Non tankers and other vessels not carrying dangerous cargoes):

Any spaces containing (or having contained) fuel and other spaces where flammable vapours may be present including adjacent areas.

Risk Area C (Non tankers and other vessels not carrying dangerous cargoes):

All areas outside the engine room workshop other than Area B above

Risk Area D (All vessels):

Engine room workshop

The table below is to be used when assessing when a hotwork permit is to be issued and when office agreement is required.

RISK AREA	CATEGORIES	SAF 04 REQUIRED?	OFFICE AGREEMENT REQUIRED?
A	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	YES	YES
A	11, 12, 13, 14	YES	NO
B	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	YES	YES
B	11, 12, 13, 14	YES	NO
C	1, 2, 3, 4, 5	YES	YES
C	8, 9, 10	YES	NO
C	6, 7, 11, 12, 13, 14	NO	NO
D	All categories	NO	NO

c) Before Hotwork (Requiring a Permit) is Started

A safety meeting is to be held in order to carry out a Risk Assessment. Time is to be taken to assess, review and plan the required work along with identifying all required safety precautions to be adopted. This meeting is to be chaired by the Master and involve those who have responsibilities for the work to be carried out. One officer is to be delegated as being responsible for the supervision of the work and another officer is to be delegated as being responsible for safety procedures. These officers are to be named on the Risk Assessment and Permit to Work (SAF 04).

All personnel involved in the preparations and in the hotwork operation must be briefed and instructed in the operation and be made aware of the responsibilities of the two officers mentioned above.

The Hotwork Permit (SAF04) is then to be completed. The checklist part of the permit is to be completed first by the officer responsible for safety. Certain items may not be applicable to the operation in question or ticked as negative. Where this is the case a suitable explanation must be made in the remarks column. Once the checklist part is completed and signed the front page is to be completed, signed by the relevant persons and countersigned by the Master. **The Master is also to initial the second and third pages.** It is important that the period of validity is accurately recorded. A copy of the permit is to be conspicuously posted in the vicinity of the area where the work is to be carried out.

Note that where hotwork is required in different locations, separate permits must be issued. When issuing more than one permit, due consideration must be given to having sufficient resources available for emergency including personnel and safety equipment.

d) Office Agreement to Hotwork

Under certain circumstances, agreement for hotwork must be obtained from the Management Office. The table in b above shows the conditions and operations where this is required.

The Master is to advise the MSQ Superintendent of his requirements with all details of the work to be carried out along with reasons for carrying out the work and safety precautions to be put in place. The Master is to advise the MSQ Superintendent of his requirements with all details of the work to be carried out along with reasons for carrying out the work and safety precautions to be put in place.

A review of the vessel's risk assessment must be made by the MSQ Superintendent utilising the Shipsure Risk Assessment database, where available onboard. If the Shipsure Risk Assessment Database is not available Form SAF03 must be used instead.

As part of the review, the MSQ Superintendent must then discuss the operation with the technical superintendent and decide whether hot work is to be allowed or not.

A further office Risk Assessment may then be carried out depending on the circumstances of the case. If there is any doubt as to the safety of the operation, agreement is not to be given. After the decision is made, the MSQ Superintendent is to advise the Master as soon as practical. If the decision has been relayed to the Master by telephone, a file note is to be made and finally must be backed up as soon as possible in writing by e-mail/telex etc to the Master.

The Hotwork Permit is to be completed with details of the above communication. Note that the agreement is not to be made with shore staff attending the ship. Should the MSQ Superintendent be onboard the vessel, the MSQ Manager or other suitable person is to be contacted for agreement.

Once the hotwork has been completed, the office is to be advised by email.

e) Hotwork in Enclosed Spaces

Any compartment in which hotwork is to be undertaken must be cleaned and correctly ventilated until there is 21% Oxygen content and **less than 1% LEL.** Ventilation must continue throughout the operation.

Wherever practicable, all sludge, oil impregnated scale, sediment or other material likely to give off flammable vapours should be removed from an area of at least 10 metres around the area of hotwork. However where the nature of the work or construction of the space makes this impractical an area of at least 3 metres around the hotwork area must be fully cleaned as well as the entire "fall-out" area below. In addition, the risk assessment must

ensure that suitable controls are put into place. These may include but are not limited to shielding, blocking lightening holes and creating a water blanket at the bottom of the space. In such cases, office agreement to such controls must be obtained. Attention is also to be given to the reverse sides of frames and areas immediately below the place where hotwork is being carried out.

Adjacent spaces must also be free of flammable liquids, gas free or inerted. Pipelines that carry oil or that are likely to contain flammable vapours must be drained, vented, gas freed and isolated from the compartment where hot work is taking place. Fire watches are to be maintained along with adequate fire fighting equipment at hand and the atmosphere checked at regular intervals.

Note that in addition to SAF04, an Enclosed Space Entry Permit (SAF11) is also to be completed.

f) Hotwork Conducted from Outside the Vessel's Structure

Where hotwork is being carried out externally on the vessel's structure, such as from a quay, boat or barge, a crew fire-watchman must be in attendance in order to co-ordinate fire-watch operations. Personnel carrying out the hotwork, including shore-contractors and boat skippers, must be made fully aware of all safety regulations in force and the areas where hotwork is permitted. A copy of the Permit to Work is to be given to the person in charge of the repair squad.

The location of the hotwork site, burning equipment, work boats etc must not be changed without the permission of a responsible officer.

g) Once Hotwork is Completed

It is essential that the areas and adjacent areas where the hotwork has been carried out are monitored for a sufficient time to ensure that there is no danger of fire breaking out.

All equipment and materials used in the operation are to be removed and the work permit signed off by the officer responsible for supervision of the work and filed.

Where office permission has been requested for hotwork, the office is to be advised by e-mail when the work has been completed.

h) Hotwork at Repair Facilities

This part of the procedure is only applicable when the repair facility has a satisfactory level of safety. This must be confirmed by the attending superintendent to the Master. A vessel which is not in such a facility, or is undergoing repairs at sea, at anchor or on a lay-by berth, must comply with parts a to g of this procedure regardless whether or not a superintendent is on board.

The number of fires on vessels undergoing repair at repair facilities has increased within the industry over the years. It is therefore essential that correct operating procedures are carried out to reduce any risk of fire or explosion.

Authorisation for hotwork performed by ship and/or shore staff within the confines of a repair berth or dry-dock will be subject to:

- Written notification from the Repair Facility Representative to the Master of the proposed areas and or spaces where Hotwork is to be carried out.

- The Chief Officer accompanying the Repair Facility Chemist on all of his inspections to ensure that all the necessary areas and or spaces are monitored.

- All the necessary gas free certificates being passed to the Chief Officer. These certificates to be sighted and signed by the Master to verify that the proposed area and or spaces where Hotwork is to be performed are gas free. Note that the Gas Free Certificate may also list specific areas to be excluded from Hotwork. There may also further detail on the reverse side of the certificate which are also to be noted and adhered to.

Prior to the vessel entering the confines of a shore-based repair facility, the repair facility representative is to be provided with the following information by the Master and Chief Engineer:

- The vessel's cargo and tank plan including the last cargo, the disposition of all fuel and lubricating bunkers. (these tanks are to be clearly marked with demarcating lines)
- Any planned transfer of oil.
- The disposition, quantities and characteristics of all dangerous goods, chemicals, petroleum, combustible materials, flammable gases and paint stores etc.
- The details of the ship's fire fighting plant and equipment and its status.
- Provision with up-to-date and concise details of the planned repairs involving any hotwork.
- Any subsequent de-ballasting details. (Note that the relevant ballast spaces must be inspected by the port chemist)
- Notification of areas where hotwork is to be excluded i.e. the use of Ring Fencing etc.

On arrival at a repair facility the Master and/or Technical Superintendent is to arrange a meeting with the repair facility's Safety Officer, and the ship's staff are to be advised of the contractors' safety regulations and requirements. All the local and repairers safety requirements are to be adhered to. Note that this meeting is to be minuted and a copy of the minutes sent to the management office.

The Master and technical superintendent are to ensure that the gas free certificates/hotwork permits are posted as appropriate, that fire watch services are provided, and that the vessel's Safety Officer (Chief Officer) is aware of these services.

4.6.8 Working with Small Craft Alongside

This procedure applies to only tankers and other vessels carrying hazardous, flammable or toxic cargoes. A Work Permit (Form SAF10) is required in circumstances where a small craft requires to come alongside and/or is engaged in work alongside.

When the checklist is completed by the Chief Officer it is then to be presented to the Master for signature. No work can commence until this permit has been signed by the Chief Officer and the Master.

If the vessel is alongside a terminal then the craft must not be allowed alongside unless the terminal has given approval either through the agent or directly to the Master.

If a small craft comes alongside without the necessary approval of the Master and/or terminal this must be immediately reported to the terminal and port authority and operations ceased immediately.

All cargo and ballast openings must be closed before the craft comes alongside and must remain so until the craft departs.

The craft must be effectively moored according to the operation to be carried out and the Master of the craft must be informed of the need to observe smoking, naked light and cooking apparatus prohibitions. The craft must also be informed of the action to be taken in the event of the emergency alarm signal being sounded on the vessel and the action in the event of flammable or toxic vapour emission. The craft must always be ready to leave the vessel at short notice under its own power.

Annex G

Yeoman Bontrup – Chemical Inventory – June 2010

Chemical Inventory

m/v " YEOMAN BONTRUP " **Jun-10**

UNITOR

		Unitor No.	Start of month	Received	Used	End of month	
1	Potable Water Stabilizer,kg	659 624916	173		10	163	neutral
2	Vaptreat,ltr	654 571364	55		5	50	neutral
3	Hand cleaner,ltr	651 571752	35		5	30	neutral
4	Gamazyme 700FN,kg	656 571711	103		5	98	neutral
5	Gamazyme BTC,botl	656 589945	32		0	32	neutral
6	Soot Remover,kg	650 571240	135		15	120	neutral
7	Boiler Coagulant,ltr	655 571331	80		5	75	neutral
8	Enviroclean,ltr	652 571380	125		15	110	neutral
9	Seaclean,lit	651 571752	40		5	35	neutral
10	Dieselguard NB, kg	653 571349	104		18	86	nitrit
11	Alkalinity control, ltr	653 571356	100		0	100	nitrit
12	Disclean, ltr	651 571687	60		0	60	acid
13	Metal-Bright,ltr	651 571661	100		0	100	acid
14	Descalex,kg	651 571646	170		0	170	acid
15	Clorinating tablets,kg	657 624858	25		1	24	acid
16	Liquitreat,ltr	655 571273	70		6	64	alkaline
17	Oxygen Control,ltr	655 571315	50		5	45	alkaline
18	Aquataff,ltr	651 607826	60		0	60	alkaline
19	Condensat control,ltr	655 571323	35		0	35	alkaline
20	Oxygen Scavenger Plus,ltr	655 698712	20		0	20	alkaline
21	Electrosolv – E,ltr	651 604389	100		0	100	petroleum
22	ACC Plus,ltr	651 698704	100		15	85	petroleum
23	Coldwash HD,ltr	651 571430	90		0	90	petroleum
24	Carbonclean LT,ltr	651575696	40		15	25	irritant
25	Hypochlorite sodium 14%	20366986	78		8	70	irritant
26	Hardness control,kg	655571299	60		10	50	irritant
27	Seacare O.S.D	652571570	100		0	100	irritant
28	Carbon Remover,ltr	651571604	15		0	15	irritant

RO Cleaner for PALL

30	Cleaner A, ltr		15	0	0	15	Acid
31	Cleaner B, ltr		10	0	0	10	Acid
32	Cleaner C, ltr		35	0	0	35	Acid
33	Cleaner D, ltr		12	0	0	12	Acid

4 Eng. _____ [redacted]

Chief Eng. _____ [redacted]

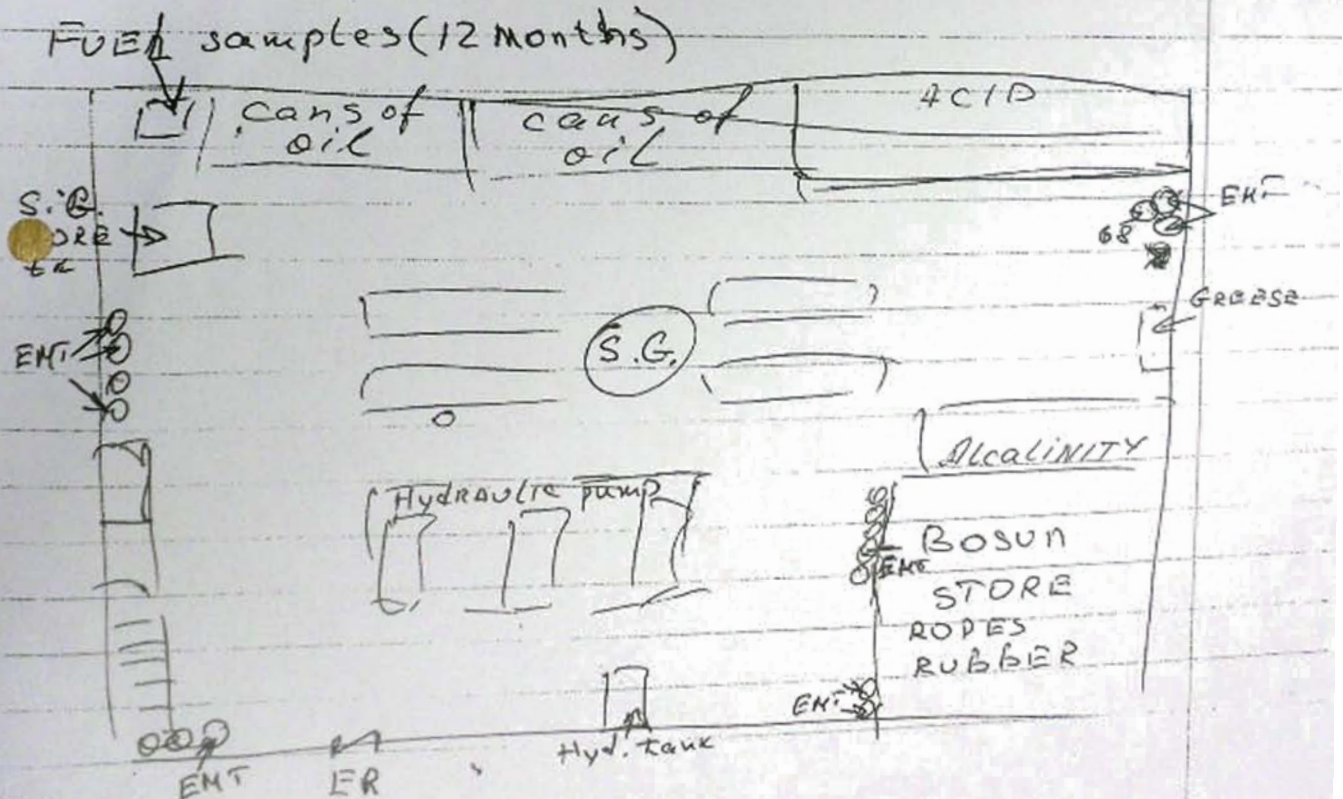
Annex H

Yeoman Bontrup – chemical stowage arrangements – June 2010

CASTROL

AWH-M 32 – ~600L (3 DRUMS)
AWH-M 68 – 1 DRUM
AWH-M100 – 1DRUM
AWH-15 – 160 LTR (8 cans)
— " — 120 LTR (1 DRUM)
PD-68 — 190L (1 DRUM)
TQ-D — 60L (3 CANS)
5W/40 – 40L (2 cans)
15W/40 — 120L (6 cans)
SN100 – 350L (15 cans)
SN 68 – 120L (6 cans)
SR 68 – 120L (6 cans)
PD46 — 180L (9 cans)
Icematic 299 - 150L (7 cans)
HG 220 — 250L (13 cans)
PG 220 – 320L (16 cans)
SX2 – 136 kg (7 cans)
AP3 – 54 kg (3 cans)

FUEL samples (12 months)



Annex I

VMS – Section 4.4.4 Working with Dangerous or Hazardous Materials and Goods

- Existing supply wiring is adequate to carry the electrical current without overloading and consequent heating;
- Flexible electric cables laid across the deck have sound insulation;
- The cable route to the worksite is the safest possible, only passing over gas-free or inerted spaces.

4.4.4 Working with Dangerous or Hazardous Materials and Goods

Return to 4.2.4

a) General

Many materials used on board ships have health and safety implications for personnel handling them. This section describes some of the hazards, which might be encountered on board and the requirements for their safe handling and use.

In addition to the contents of this section, the Code of Safe Working Practices is to be consulted for detailed guidance. For every dangerous or hazardous material handled on board, a Material Safety Data Sheet (MSDS) is to be provided and available to all personnel working with the material. These data sheets are to be posted up in all storage areas, i.e. chemical store and paint locker. All dangerous materials are only to be used in accordance with the manufacturer's instructions. Dangerous or hazardous materials which are not specifically mentioned in this section are to be subject to a full risk assessment prior to use on board.

Dangerous, hazardous or irritating substances are to be handled only under instruction from and under the supervision of a responsible officer. The responsible officer is to instruct, inform and train crew, so that they understand the risks arising from their work with dangerous or hazardous materials and the precautions to be taken.

The use of dangerous or hazardous materials and substances detailed in paragraphs b) – g) are to form part of routine risk assessments.

b) Use and Storage of Chemicals

Hazardous or toxic substances, chemicals and similar products must be utilised and stored so that users and other personnel are safeguarded against accidents, injuries or other harm. These substances can provide a range of toxic and harmful effects to users.

A well constructed, ventilated and secure storage area is to be used to store all chemicals, and material must only leave this area under the supervision of a responsible officer. Materials having different properties and safety concerns are to be stored apart from each other and the storage area is to provide protection and security from accidental spillage or damage to containers from the vessel's motion in a seaway. There must be no possibility of other important equipment such as mooring lines becoming damaged by chemical spills.

Original containers are always to be used to identify the contents and avoid confusion. Chemicals must never be used from unlabelled containers and containers are to be properly sealed and secured after use. MSDS are to be posted up adjacent to each type of chemical and the particular dangers of each are to be highlighted.

Chemicals must always be handled with great care and personal protective equipment utilised. This equipment is to consist of eye protection, rubber gloves and apron. Care is to be taken not to breathe chemical vapours. Proprietary eye wash liquid is to be available as a first aid measure to remove chemical from the eyes and skin.

c) Use and Storage of Paints and Thinners

Paints and thinners present significant fire and explosion hazards due to their volatile nature. They also have toxic properties if vapours are inhaled. They must only be stored in the designated fire protected locker which is to be kept well ventilated. Light and other fittings are to be explosion proof and be kept in good order. Drums of paint and thinners must be kept closed to reduce vapour release to a

Annex J

VMS – (Ship Safety Training and Record Book) Section 8.3 Onboard Drills

Form SAF 01 has been developed to demonstrate that the necessary familiarisation has taken place. On satisfactory completion of familiarisation training the Master is to ensure that this form is completed for all seafarers on board and a copy filed within Appendix 1 of this record book. The Master is to use the spaces on the checklist to enter details of any ship specific equipment with which familiarisation training has been carried out.

In addition to the above, an appropriate entry is to be made into the Personal Training Record Book supplied to all seafarers.

Reference is also to be made to section 5 of the Company's Crew Manual.

8.3 ONBOARD DRILLS

The frequency of drills held on board the vessel is dictated by SOLAS and the vessel's flag state. In some cases port state legislation e.g. OPA 90 in USA imposes additional requirements upon the vessel.

It is the Masters responsibility to ensure that the frequency and nature of the drills held on board meet the requirements of all legislation appropriate to the vessel and it's trading area.

Drills should cover all scenarios listed within the SOPEP in a 12-month period with oil spill drills being held every three months. This has the benefit of ensuring that all personnel on board become familiar with the SOPEP and highlight any areas where improvements or additional training may be required.

A Drill and Exercise Matrix (Form SAF24) is available in order to identify different exercise scenarios and to assist in forward planning. SAF24 is also to be used as a vessel record of drill dates and be kept in appendix 1 of this book. Individual records are also to be maintained in the seafarer's Personal Training & Service Record Book. All SOLAS required drills are to be recorded in the deck log.

A Drill and Exercise Report (SAF25) is to be completed after each drill is carried out. This is in the form of a checklist to ensure drills are being carried out correctly. It also acts as a record as well as giving the opportunity to make observation or comments on the drill with a view to making improvements in future drills.

8.4 On Board Training

The ship's compliment must be trained in all aspects of shipboard safety and operations. Much of this training can be carried out on board the vessel. Effective on board training will lead to successful drills, and should the need arise, an effective response to an emergency situation.

Any training carried out onboard by ships officers (or by third party trainers attending the vessel) is entered into SAF26 (Record of Onboard Training). This record is to be filed within Appendix 1 of this book.

The nature of the training carried out is left to the Master or trainers to determine. As guidance all members of the crew should be able to operate all basic safety equipment and be familiar and comfortable in its use.

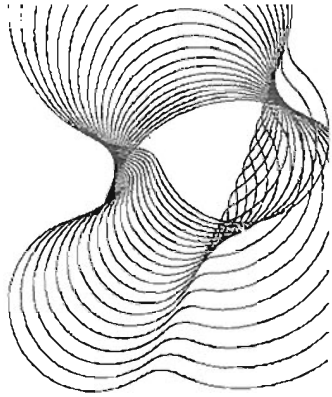
When assessing what training is required, Masters should consider the experience and ability of the crew on board. Training should be spread across all departments for example the cook and mess man should be trained in how to start the lifeboat engine.

Vessels, which have been supplied with a pack of safety videos, must make effective use of these and enter details of their use within SAF26.

(Retain the original of this sheet and make copies for use, entering the Year in the top left-hand box).

Annex K

Buildings Research Establishment Fire Test report No 266-903 dated 15 November 2010 - executive summary, summary of principal outputs of the cone calorimetry tests and conclusions



Executive Summary

BRE Global has been commissioned by the Marine Accident Investigation Branch (MAIB) to undertake a number of fire tests in support of an investigation of an incident on board the self-unloading cargo vessel *Yeoman Bontrup* (BRE proposal 128125, accepted by client 13th October 2010). The MAIB require information on the fire performance of the materials identified as contributing significantly to fire development. BRE Global has simulated potential ignition sources based on information supplied by MAIB and using materials supplied by the client. The results from the ignition tests are supported by standard reaction to fire tests to investigate ignitability and rate of heat release once ignited.

At the time of the incident it is known that repairs, which included hot work, were being undertaken in the cargo discharge hopper. Initial ignition simulations involved heating a representative nut and bolt arrangement, similar to those used to secure sacrificial tiles in the hopper, to approximately 1000°C using a gas lamp and placing the heated bolt in direct contact with the various components of the conveyor belt. These tests did not result in sustained ignition. Subsequent tests used an oxy-acetylene burner to heat the bolt to temperatures sufficient to cause localised melting. These tests demonstrated that a bolt cut using an oxy-acetylene torch could cause ignition of the conveyor belt and, under the most favourable circumstances with regard to landing position of the bolt, orientation of the belt, presence of a through draft etc. could lead to extensive and rapid fire spread.

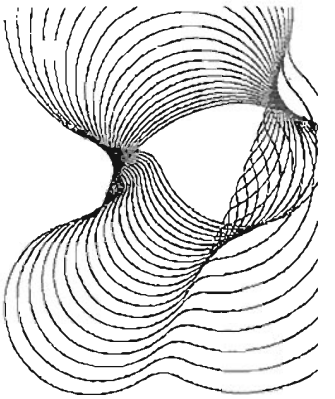
The conclusions from the ignition tests are supported by the results from the reaction to fire tests which show a rapid rate of heat release once ignited.

The following samples were provided for testing by the client:

Sections of base belt, side curtain and cleat, similar to materials used for the conveyor belt on the *Yeoman Bontrup*.

The material provided was sufficient to enable the Phase 1 ignition tests and part of the Phase 2 ignition tests to be completed. From the material provided BRE Global arranged for samples to be prepared in accordance with the standard test procedures for reaction to fire testing.

Worn side curtain material similar to that used on the *Yeoman Bontrup* was provided by the client to complete the Phase 2 ignition tests.



A summary of the principal outputs from the cone calorimetry tests is shown in Table 5.

Component	Time to ignition (s)	Total HRR (MJ/m²)	Peak HRR (kW/m²)
Base belt	32	177.8	449.2
Cleat	25	254.8	521.2
Side curtain	23.5	250.9	440.0

Table 5 Principal outputs from cone calorimetry BS 476-15 (ISO 5660-1)

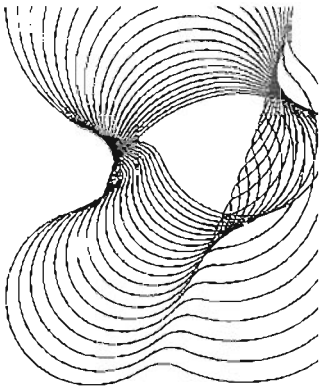
The average measured heat of combustion for the side curtain material is approximately 32 MJ/kg which is approximately what would be expected from combustion of a rubber tyre.

One means of assessing and classifying performance is through the Maximum Average Heat Release Emission (MAHRE) as measured in the cone tests. The average measured MAHRE values for each component are summarised in Table 6. The results from the base belt are complicated by the issue of spalling and the associated loss of mass which is not part of the combustion process. Therefore the values for the cleat and side curtain are probably more reliable.

Component	Average MAHRE (kW/m²)
Base belt	157.2
Cleat	241.0
Side curtain	271.5

Table 6 Average MAHRE values from cone calorimetry

MAHRE is one means by which the fire performance of materials and components is restricted for applications in railways[3]. Regardless of the hazard classification the maximum allowable value for MAHRE for applications in railways is 90kW/m².



Conclusions

BRE Global has carried out a range of material fire tests at the request of MAIB in order to assist with investigations into a fire onboard the *Yeoman Bontrup* cargo vessel. A series of tests have been conducted to investigate one potential ignition scenario where a heated nut and bolt has fallen into the conveyor belt and initiated a seat of burning which has eventually spread to involve the entire vessel. The ignition tests have been supported by a number of reaction to fire tests undertaken in accordance with the provisions of standard tests. From the work undertaken the following conclusions can be drawn:

- Heating a nut and bolt to approximately 1000°C and placing the heated nut and bolt into contact with the components of the conveyor belt did not lead to ignition of the materials.
- The components of the conveyor belt are difficult to ignite with a naked flame. In order to maintain combustion the ignition source needs to be applied for a prolonged period typically up to 30 seconds.
- A nut and bolt heated to temperatures consistent with cutting using an oxy-acetylene torch (approximately 1300°C) and placed on to the component materials can lead to instantaneous ignition of both the cleat and side curtain of the conveyor belt. Subsequent flame development is dependent on the orientation of the component, the presence of a through draft and the location of the initial ignition source.
- Ignition did not occur when the components were subjected to direct impingement of flame on the flat surface (BS EN ISO 11925-2)
- Both the base belt and the side curtain ignited immediately when the flame source was applied to an edge of the material (BS EN ISO 11925-2)
- The behaviour of the various components tested in the cone calorimeter (BS 476-15 (ISO 5660-1)) was similar. All components exhibited a rapid early heat release rate with a peak rate of between 450 and 550kW/m².
- All components formed a char layer during the test which initially retarded the fire growth rate.
- Once ignited combustion of the base belt led to extensive spalling and the production of burning brands. This may be influenced by the presence of reinforcement within the belt.