

PT. Sari Dumai Sejati Material Safety Data Sheet – Crude Palm Oil – Undated

MATERIAL SAFETY DATA SHEET

SECTION 1 : PRODUCT AND COMPANY IDENTIFICATION

1. PRODUCT DETAILS
PRODUCT NAME : CRUDE PALM OIL
CLASSIFICATION : EDIBLE VEGETABLE OIL
2. COMPANY IDENTIFICATION
NAME OF COMPANY : PT. SARI DUMAI SEJATI
PHONE NUMBER : (0765) 7007670
FAX NUMBER : (0765) 7007672
ADDRESS : DESA LUBUK GAUNG KECAMATAN SEI
SEMBILAN DUMAI-RIAU

SECTION 2 : PHYSICAL AND CHEMICAL PROPERTIES

MELTING POINT (°C) : 33-39
BOILING POINT : NOT APPLICABLE
DENSITY at 50°C : 0,885
VAPOR PRESSURE (mm Hg at 25°C) : NOT APPLICABLE
APPEARANCE : REDISH-YELLOW, LIQUID
SOLUBILITY IN WATER : NOT SOLUBLE
ODOUR : FAINT FAT ODOUR
FLASH POINT : ABOVE 200°C
STABILITY : BIODEGRADABLE
CONDITION TO AVOID DURING STORAGE : TEMPERATURE ABOVE 35°C

SECTION 3 : FIRST AID MEASURES AND HEALTH HAZARDS

EYE CONTACT : RINSE THOROUGHLY WITH PLENTY WATER
SKIN CONTACT : WASH WITH SOAP AND WATER
HEALTH HAZARDS (ACUTE & CHRONIC) : NONE KNOWN
CARCINOGEN OR SUSPECT INGREDIENTS : NONE KNOWN
EFFECT OF EXPOSURE : NONE KNOWN

SECTION 4 : EXPLOSION HAZARD DATA

HAZARDOUS COMBUSTION : CARBON MONOXIDE, SOOT, SMOKE
- PRODUCTS : CARBON MONOXIDE, SOOT, SMOKE
- EXTINGUISHING MEDIA : DRY POWDER, FOAM, CARBON DIOXIDE
FLAMMABILITY : COMBUSTIBLE IN PRESENCE OF FLAME

SECTION 5 : STORAGE AND HANDLING PROCEDURES

PRECAUTIONS TO BE TAKEN IN STORAGE & HANDLING : STORE AWAY FROM HEAT SOURCES AND FLAME.
DO NOT CONTAMINATE DRAINS AND SEWAGE SYSTEM.

SECTION 6 : SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION : NOT REQUIRED
EYE PROTECTION : NOT REQUIRED
PROTECTIVE GLOVES CLOTHING : NOT REQUIRED

SECTION 7 : SPILL AND LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK : SOAK UP WITH SAND OR OTHER ABSORBENT. WASH WITH SOAP AND WATER.
WASTE DISPOSAL METHODS : OBSERVE ALL LOCAL, STATE AND FEDERAL REGULATIONS (PRODUCT IS READILY BIODEGRADABLE)

PT. Sari Dumai Sejati Material Safety Data Sheet – RBD Palm Oil Stearin – Undated



PT. SARI DUMAI SEJATI

DESA LUBUK GAUNG KECAMATAN SEI SEMBILAN DUMAI-RIAU

Tel: (0765) 7007670 Fax: (0765) 7007672

MATERIAL SAFETY DATA SHEET

SECTION 1 : PRODUCT AND COMPANY IDENTIFICATION

1. PRODUCT DETAILS
PRODUCT NAME : RBD PALM STEARIN
CLASSIFICATION : EDIBLE VEGETABLE OIL
2. COMPANY IDENTIFICATION
NAME OF COMPANY : PT. SARI DUMAI SEJATI
PHONE NUMBER : (0765) 7007670
FAX NUMBER : (0765) 7007672
ADDRESS : DESA LUBUK GAUNG KECAMATAN SEI SEMBILAN DUMAI-RIAU

SECTION 2 : PHYSICAL AND CHEMICAL PROPERTIES

MELTING POINT (°C) : 44 MIN
BOILING POINT : NOT APPLICABLE
DENSITY at 60°C : 0,88-0,90
VAPOR PRESSURE (mm Hg at 25°C) : NOT APPLICABLE
APPEARANCE : YELLOWISH WHITE, SOLID
SOLUBILITY IN WATER : NOT SOLUBLE
ODOUR : FAINT FAT ODOUR
FLASH POINT : ABOVE 200°C
STABILITY : BIODEGRADABLE
CONDITION TO AVOID DURING STORAGE : TEMPERATURE ABOVE 70°C

SECTION 3 : FIRST AID MEASURES AND HEALTH HAZARDS

EYE CONTACT : RINSE THOROUGHLY WITH PLENTY WATER
SKIN CONTACT : WASH WITH SOAP AND WATER
HEALTH HAZARDS (ACUTE & CHRONIC) : NONE KNOWN
CARCINOGEN OR SUSPECT INGREDIENTS : NONE KNOWN
EFFECT OF EXPOSURE : NONE KNOWN

SECTION 4 : EXPLOSION HAZARD DATA

HAZARDOUS COMBUSTION
- PRODUCTS : CARBON MONOXIDE, SOOT, SMOKE
- EXTINGUISHING MEDIA : DRY POWDER, FOAM, CARBON DIOXIDE
FLAMMABILITY : COMBUSTIBLE IN PRESENCE OF FLAME

SECTION 5 : STORAGE AND HANDLING PROCEDURES

PRECAUTIONS TO BE TAKEN IN STORAGE & HANDLING : STORE AWAY FROM HEAT SOURCES AND FLAME.
DO NOT CONTAMINATE DRAINS AND SEWAGE SYSTEM.

SECTION 6 : SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION : NOT REQUIRED
EYE PROTECTION : NOT REQUIRED
PROTECTIVE GLOVES CLOTHING : NOT REQUIRED

SECTION 7 : SPILL AND LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK : SOAK UP WITH SAND OR OTHER ABSORBENT, WASH WITH SOAP AND WATER.
WASTE DISPOSAL METHODS : OBSERVE ALL LOCAL, STATE AND FEDERAL REGULATIONS (PRODUCT IS READILY BIODEGRADABLE)

P.T. SARI DUMAI SEJATI

Dunk Tankcleaning Services Ltd – Checklist Before Entering The Tank



Subject : m/t " Bro Arthur " (please return)

Checklist before entering the tank.

- * During our stay on board of your vessel we expect to can use the accommodation, cabins (suez cabin) 6 people and can have meals in the crew's mess room.
- * Permission for entering the tank from chief officer.
- * One crew member / duty officer to be stand by at the tank, be sure that the correct tank will be entered.
- * Mobile ventilation and (air driven) proper light, at least 30 minutes before entering the tank.
- * Measuring explosion limit.
- * Measuring carbon monoxide, nitrogen, oxygen (20,5)
- * When tank to be swept heating coils off before sweeping gang goes down.
- * Discharging until the heating coils on the for part area, incase of non heatingcoils, discharge level before sweeping must be one feet in the fore part area of the tank, depending on the trim.
- * Trim by the stern and list / port / stbd when is necessary, for optimal sweeping results.
- * Safety line and compress air bottle standby.

Dunk Tankcleaning Services B.V.



Signed the date :

Master .

“Sweeping” risk assessment undertaken at 1300 on 19 February 2010

Risk Assessment Form

FM171

Valid from 20-04-2009

Version 3

Type of task

Routine ☐

New Routine ☐

Non routine ☒

Vessel	Bro Arthur	Assessment date	2010-02-19
Place	Hamburg		

Description of task

(For work on critical equipment the section at the end of this form must be completed)

Tank Sweeping of Cargo (Palm Oil, Palm stearin)

Risks identified

Ensure all of the following risk types are evaluated

1. Risk of harm to personnel.
2. Risk of environmental damage.
3. Risk of damage to third party assets.
4. Risk of damage to the vessel.
5. Risk of failure of critical equipment.
6. Risk to commercial activities.
7. Risk of damage to reputation.
8. Other risks identified.

Formal Risk assessment matrix					
Severity	Consequences	Likelihood			
		1	2	3	4
		Very un likely	Un likely	Likely	Very likely
1	Minor	1	2	3	4
2	Serious	2	4	6	8
3	Major	3	6	9	12
4	Catastrophic	4	8	12	16

No	Risk type	Description of risk	Severity	Likelihood	Risk scoring
1	1	Risk of falling/slipping	3	3	9
2	1	Risk of asphyxiation	4	3	12
3	1	Risk of skin burn	3	1	3

Measures taken to reduce the risks identified

No	Description of control measures
1	Use of air light in darkness, use of non slip boots
2	Check of atmosphere, continue ventilation, use of portable multigas detector
3	Use of rubber gloves and special boots

Reassessment of hazards after risk reduction measures applied

No	Risk type	Residual risks identified	Severity	Likelihood	Risk factor
1	1	Risk of falling/slipping	3	1	3
2	1	Risk of asphyxiation	4	1	4
3	1	Risk of skin burn	2	1	2

Assessment of the impact of the following risk factors,

Personnel Factors (PF)	Identify where proper planning, leadership and training are required.
Job Factors (JF)	Identify the standard of equipment or where equipment is not working or cannot be relied on.
Unsafe Conditions (UC)	Identify all unsafe conditions that exist within the working environment and the potential consequences.

No	Risk factor type	Description of Risk factors	Description of control measures
1,3	PF/UC	Risk of Falling/slipping	Use Proper PPE, air light to see the ladder and any obstruction.
2	JF	Failure of Multi gas detector	Calibrate and test before use

Review of measures by authorised person

No	Additional control measure required
1	Look out with communication inside the tank
2	Check of communication equipment

.....
Prepared by

Yes, 2010-02-19 -13:00
.....
Authority to proceed Yes/No
Time/Date

For work on critical equipment the following section to be completed.



Risk Assessment Form

FM171

Valid from 26.09.2008
Version 2.02

Additional measures for work on critical equipment. PR248

Equipment or machinery affected		
Equipment PMS code		
Category of equipment, Critical or Sensitive?		
Type of work, regular maintenance or repair?		
PMS job description (JD) number		
Are spare parts available?		
P/O reference		
Alternative back-up equipment/systems		
Estimated downtime		
If estimated downtime exceeded. Perform a new Risk Assessment		
Authorised person responsible to carry out the work		

Multiple Enclosed Space Entry Permit for Nos 1 and 2 cargo tanks –
signed at 1750 – 19 February 2010



Enclosed space entry permit - single or multiple

FM041

Valid from 2009-02-18
Version 7

Instructions for enclosed space entry are covered by PR053.

Ship: <u>PRO ARTHUR</u>			
General:			
Location(s)/Name of enclosed Space(s):		<u>IC, AC, SC 2C</u>	
Reason for Entry:		<u>TANK SWEEPING</u>	
This permit is valid from	<u>1750</u> hrs	Date <u>19.02.10</u>	(See Notes 1 and 4)
to	<u>0150</u> hrs	Date <u>20.02.10</u>	

Maximum period of validity must not exceed 8 Hours

SECTION 1 - Pre-Entry Preparations (To be checked by the master or responsible officer)		
Check	Description	Remarks
✓	Has the space(s) been segregated by blanking off or isolating all connecting pipelines?	<u>Yes</u> , <u>IC LINE DISCONNECTED</u>
✓	Have valves on all pipelines serving the space(s) been secured to prevent their accidental opening?	<u>ALL INFORMATION</u>
✓	Has the space(s) been cleaned?	<u>NO</u>
✓	Has the space(s) been thoroughly ventilated?	<u>Yes</u>
✓	Have atmosphere tests been recorded in Part 2 (See Note 2)	<u>Yes</u>
✓	Has the space(s) been tagged "Safe for Entry" with date/time and duration of Permit?	<u>Yes</u>
	Has a Formal Risk Assessment been carried out? <u>PR277</u>	<u>Yes</u> N/A

☒ Tank / Enclosed Space tagged Green **SAFE FOR ENTRY**

☐ Tank / Enclosed Space without Tag **UNSAFE TO ENTER - ENTRY PROHIBITED**

Readings:

Oxygen	<u>21.6</u>	% vol (21%)
Hydrocarbon	<u>0.7</u>	% LFL (less than 1%)
Toxic gases (See Note 3)	<u>CO - 0 TLV 25ppm</u>	ppm (specify gas & TLV)

✓	Have arrangements been made for frequent atmosphere checks to be taken and recorded while the space is occupied and after work breaks?	Frequency of Checks <u>30 min</u>
✓	Have arrangements been made for the space to be continuously ventilated throughout the period of occupation and during work breaks?	<u>Yes</u>
✓	Is rescue and resuscitation equipment available for immediate use by the entrance to the space? Adequate	<u>Yes by his equipment</u>



Enclosed space entry permit - single or multiple

FM041

Valid from 2009-02-18

Version 7

<input checked="" type="checkbox"/>	illumination provided?	Yes
<input checked="" type="checkbox"/>	Has a responsible person been designated to stand by the entrance to the space?	Yes
<input checked="" type="checkbox"/>	Has the officer of the watch (bridge, engine room, Cargo control room) been advised of the planned entry?	Yes

<input checked="" type="checkbox"/>	Has a system of communication between the person at the entrance and those entering the space been agreed and tested?	Yes
<input checked="" type="checkbox"/>	Are emergency and evacuation procedures established and understood? (See Note 4)	Yes
<input checked="" type="checkbox"/>	Is there a system for recording who is in the space?	CCP
<input checked="" type="checkbox"/>	Is all equipment used of an approved type?	Yes

SECTION 2 - Pre-Entry Checks

(To be checked by the person authorised as leader of the team entering the space)

<input checked="" type="checkbox"/>	Section 1 of this permit has been completed fully?	Yes
<input checked="" type="checkbox"/>	Emergency and evacuation procedures have been agreed and I am aware that the space must be evacuated immediately in the event of ventilation failure or if atmosphere tests change from the agreed safe criteria.	Yes
<input checked="" type="checkbox"/>	I have agreed the communication procedures.	Yes
<input checked="" type="checkbox"/>	I have agreed upon a reporting interval.	10 min
<input checked="" type="checkbox"/>	All enclosed space(s) not listed on this permit to be kept closed.	Yes

The following signature boxes are not to be signed by the same person::

Signature of Master/Responsible Officer	Date 19.02.10	Time 1750
Confirms spaces have been tested safe for entry, 'Safe for Entry' tag in position and Responsible person selected.		

Signature of Responsible person supervising entry	Date 19.02.10	Time 1750
Confirmations the safeguards as described above and in PR053 are understood and will be complied with.		

THIS PERMIT IS RENDERED INVALID SHOULD VENTILATION OF THE SPACE STOP OR IF ANY OF THE CONDITIONS NOTED IN THE CHECKLIST CHANGE.

Extract from International Maritime Organization's MSC.133(76)

- 4 Tunnels passing through cargo holds shall be equipped with ladders or steps at each end of the hold so that personnel may easily cross such tunnels.
- 5 Permanent ladders, except for vertical ladders, which are fitted on vertical structures for close-up inspection or thickness measurement, shall be inclined at an angle of less than 70°. There shall be no obstructions within 750 mm of the face of the inclined ladder, except that in way of an opening this clearance may be reduced to 600 mm. The flights of ladders shall not be more than 9 m in actual length. Resting platforms of adequate dimensions shall be provided. Ladders and handrails shall be constructed of steel or equivalent material of adequate strength and stiffness and securely attached to the tank structure by stays. The method of support and length of stay shall be such that vibration is reduced to a practical minimum. In cargo holds, ladders shall be designed and arranged so that the risk of damage from cargo handling gear is minimized.
- 6 The width of ladders between stringers shall not be less than 400 mm. The treads shall be equally spaced at a distance apart, measured vertically, of between 250 mm and 300 mm. When steel is used, the treads shall be formed of two square bars of not less than 22 mm by 22 mm in section, fitted to form a horizontal step with the edges pointing upward. The treads shall be carried through the side stringers and attached thereto by double continuous welding. All sloping ladders shall be provided with handrails of substantial construction on both sides, fitted at a convenient distance above the treads.
- 7 No free-standing portable ladder shall be more than 5 m long.
- 8 Portable ladders more than 5 m long may only be utilized if fitted with a remotely controlled mechanical device to secure the upper end of the ladder.
- 9 Movable means of access includes such devices as:
- .1 hydraulic arm fitted with a stable base and with local control at the safety cage. The operational conditions should be in accordance with applicable safety requirements of the manufacturer; and
 - .2 wire lift platform.
- 10 For bulk carriers, access ladders to a cargo hold shall be:
- .1 where the vertical distance between the upper surface of adjacent decks or between deck and the bottom of the cargo space is not more than 6 m, either a vertical ladder or an inclined ladder; and
 - .2 where the vertical distance between the upper surface of adjacent decks or between deck and the bottom of the cargo space is more than 6 m, an inclined ladder or ladders, except the uppermost 2.5 m of a cargo space measured clear of overhead obstructions and the lowest 6 m may have vertical ladders, provided that the vertical extent of the inclined ladder or ladders connecting the vertical ladders is not less than 2.5 m.

Instruction PR053 – Enclosed Space Entry dated 15 September 2008

Objective

The objective of this procedure is to ensure that proper routines are implemented to ensure the safety of the personnel who are required to enter an enclosed space.

Enclosed spaces include cargo tanks, pump-rooms, ballast tanks, void spaces, peak tanks, cofferdams, chain lockers, bunker tanks, freshwater tanks, machinery internals and any other spaces that are normally kept closed with poor or no natural ventilation.

If in doubt a compartment should be regarded as an enclosed space.

Scope

This procedure applies to all crew members entering an enclosed space area onboard a Company vessel.

Responsibility

The System Revision Committee (SRC) is responsible for the preparation and any subsequent revisions to this procedure.

The Manager QSE is responsible for monitoring that this procedure is complied with.

The Master is responsible for ensuring that the procedure is fully implemented on board.

The Chief Officer or another officer specifically designated for this purpose shall, at all times, be responsible for the correct implementation of this procedure.

The Chief Engineer is responsible for ensuring this procedure is followed entry into engine room enclosed spaces.

Implementation

Lack of oxygen should always be suspected in tanks and other compartments that have been closed for some time, particularly if they have contained water or have been subjected to damp or humid conditions.

Inert gas, by virtue of its very low oxygen content, will not support life. Its presence must always be suspected in the cargo tanks and in adjacent compartment in tankers.

The presence of hydrocarbon or other toxic gases must always be suspected in the cargo tanks, pump rooms and adjacent compartments.

Even where a cargo tank has previously been tested and found gas free, a danger may exist from gas evolution from sludge, scale and cargo residues particularly if disturbed or subjected to a rise in temperature.

Testing procedure

No entry will be permitted into any enclosed space unless the atmosphere inside has been tested and found to contain sufficient oxygen and to be free of hydrocarbon and toxic gases. Prior to entry an Enclosed Space Entry Permit must have been issued by a responsible officer (either the Chief Officer or a responsible Officer delegated and directed by the Chief Officer) who has ascertained, immediately prior to entry, that the atmosphere within the space is in all respects safe.

Entry into enclosed spaces, especially cargo tanks for inspection and mopping operations is a routine task. Where extra risks are involved (i.e, entering a space in hours of darkness or during bad weather) or when entry into an enclosed space is required for non routine tasks then a full [Formal Risk Assessment PR277](#) is to be carried out in addition to complying with this procedure.

Before issuing an entry permit, the responsible officer should ensure that,

- The space contains 21% oxygen as determined by the use of a properly calibrated oxygen meter.
- That hydrocarbon gases are 1% or lower of the LFL as measured using a properly calibrated explosimeter.
- Should the space have contained toxic cargoes or be suspected of containing toxic gases then tests using cargo specific chemical tube detectors are to be used to monitor the atmosphere within the space. Readings are to be interpreted from the instructions provided by the makers of the tube detectors and the TLV complied with.

Entry Permit

Prior to any entry into an enclosed space the [Enclosed Space Entry Permit FM041](#) is to be completed and signed. This form is designed to cover single or multiple tank entries and the recording of initial and subsequent checks of the spaces concerned.

Whenever more than one space is covered by the permit strict controls are essential to ensure that the space(s) that are safe for entry and are correctly identified and marked. Effective controls are to be in place to ensure the cancellation of all previously issued permits.

The Chief Officer is to ensure that the following routines are followed when single or multiple tank entry permits are issued.

1. For all spaces that have been found safe for entry a green board shall be displayed at the entrance to the space with the following information attached,
'SAFE FOR ENTRY'
Identification of space
Date and time of testing
Duration of permit
Tested by
Permit valid for (access only, tank cleaning operations, cold work or hot work)
2. Where possible all spaces that have not been tested and are therefore unsafe for entry should be kept securely closed.

Although a space may be marked as safe for entry all crewmembers are to be constantly reminded of the following,

1. Never enter a space alone.
2. Always double check with the responsible Officer that the permit is still valid.
3. If they observe others entering a space alone immediately advise them to stop and wait for the proper safeguards to be in place.

Safeguards for Enclosed Space Entry

Prior to entering a space the following safeguards are to be in place,

1. The personnel undertaking the task should ensure that these safeguards are put into effect prior to entering the space.
2. Effective ventilation will be maintained continuously while the enclosed space is occupied.
3. Lifeline and harnesses are to be ready for immediate use at the entrance to the space.
4. Approved positive pressure breathing apparatus and resuscitation equipment is to be ready for immediate use at the entrance to the space.
5. Where possible, a separate means of access is to be provided for use as an alternative means of escape in an emergency.
6. A responsible member of the crew is to be in constant attendance outside the enclosed space in the immediate vicinity of the entrance and in direct contact with a responsible Officer. The line of communications for dealing with emergencies should be clearly established and understood by all concerned.

When an accident occurs in an enclosed space the first action is to raise the alarm. On no account should the attending crew member attempt to enter the space. Once the emergency team has arrived and the situation assessed then rescue operations can commence.

7. Regular atmosphere checks, frequency as defined in FM041, should be carried out all the time personnel are within the space and a full range of tests should be undertaken and recorded prior to re-entry into the tank after any break.

The following personnel protective equipment is to be provided and worn,

1. Protective clothing including work clothing or protective suits, safety boots, safety helmet, gloves, safety glasses.
2. For large spaces, or where climbing access will be undertaken, the wearing of safety harnesses may also be appropriate.
3. Approved safety torches.
4. Approved UHF radio.
5. Personal gas detector or an area gas detector and alarm.
6. Personal oxygen analyser and alarm.
7. Emergency Escape Breathing Device(s) subject to Risk Assessment.

Records and traceability

All Enclosed Space Entry Permits are to be filed in hard copy on board in a permanent file.

References

ISGOTT Chapter 10
Tanker Safety Guide Chapter 3

Attachments

[Enclosed Space Entry Permit FM041](#)
[Formal Risk Assessment PR277](#)

Instruction PR277 – Risk Assessment Procedure dated 13 July 2009

PR277
RISK ASSESSMENT PROCEDURE**Objective**

The objective of carrying out a risk assessment procedure is to identify all of the potential hazards beforehand and put in place safe guards so that the task is carried out safely.

Risk Assessment can be applied to any task or operation and, if used correctly, can mitigate the risks involved and help ensure that the task is completed safely.

This procedure describes processes that lead to the reduction of risk. The total elimination of risk is often unrealistic but situations can be managed so as to reduce the risks involved to As Low As Reasonably Possible **A.L.A.R.P.** Risk reduction can be managed by proper planning, the implementation of safe working practises and the use of appropriate equipment

Scope

This Risk Assessment procedure is to be applied to all activities which threaten the safety of personnel, the environment, the ship and equipment and the good reputation of the Company.

Risk assessment is a particularly valuable tool on board vessels given the risks involved and the working environment ships operate within.

Responsibility

The Manager QSE and the Manager Technical Operations are responsible for ensuring that this procedure is followed.

On board, the Master is responsible for ensuring that this procedure is followed.

Depending on the severity of the risk being assessed Company approval may be required prior to continuing with the task. Should Company permission to proceed be required then the decision will be taken by the Manager QSE or the Manager Technical Operations or both.

Implementation

Risk Assessment process consists of identifying the following,

1. What are the dangers and risks involved in the planned operation? What could go wrong?
2. What is the likelihood of something going wrong?
3. What will be the consequences if things go wrong? How do they affect the safety of personnel, risks to the environment, damage to equipment, reputation and commercial operations?
4. What can be done to mitigate the risks involved?
What planning is required?

5. What authority is required in order to proceed further with the task?
6. Based on the mitigating measures taken what is the re-evaluated level of risk?

The company utilises two different tools to implement risk assessment:

1. A simple but effective procedure called "Take 5". By following these simple steps on a daily basis, before commencing any task, will lead to improved safety.
2. For tasks which involve more risk, either because of the dangers involved or because the task has not been attempted before a more 'Formal Risk Assessment' procedure is to be followed.

'Take Five'

This easy to remember process is utilised to evaluate the risks involved for routine and everyday tasks where carelessness or complacency may lead to unsafe acts. 'Take Five' means take the five minutes and the following five steps to,

1. **STOP OBSERVE**
Take the time to assess the task, preferably as a team but it can also be done by an individual.
2. **WALK THROUGH THE TASK**
Try to imagine what could go wrong.
3. **IDENTIFY THE HAZARD**
What are the hazards involved?
Explosive or toxic gases or chemicals involved, access difficulties, slippery decks, bad weather, electrical hazards, working at a height ect.
4. **CONTROLL AND COMMUNICATE**
Take action to reduce the dangers and communicate to others what has been done.
5. **SAFELY COMPLETE THE TASK**
At all times be vigilant to what is happening around you until the task is complete.

All crew members are to utilise the above process prior to commencing any task. The Master is to ensure that use of the above five steps are promoted on board by all effective means.

In order to remind all crew members of the 'Take Five' process each will be issued with a pocket sized card describing the five steps to follow.

Formal Risk Assessment

For tasks where a high degree of risk is involved or for tasks where no previous experience is available a formal risk assessment is to be carried out.

A formal risk assessment shall always be carried out when,

1. Working on or repairing any of the vessels critical equipment.
2. For all tasks where a permit to work system is required. For example, hot work or entry into enclosed spaces to perform non routine tasks.
3. Any task that could threaten the safety of personnel, damage to the environment, damage to equipment or adversely affect the reputation of the Company.
4. Any operation being carried out for the first time.

Definitions of tasks

Routine Tasks are defined as those tasks performed regularly on board the vessel where the frequency can be determined and where there are established safety procedures in place.

New Routine Tasks are defined as those tasks that require to be performed regularly but where there are no or insufficient procedures in place.

Non Routine Tasks are defined as those tasks which occur infrequently and for which there are no specific safety procedures in place. They generally involve a higher degree of risk and require a detailed risk assessment.

Assessing the risk

Effective risk management requires a systematic approach and must be supervised by a department manager or senior officer on board. A formal risk assessment must always be carried out by a team of a minimum of 3 persons, preferably those directly involved with the task.

The team is to 'brain storm' to identify the dangers and risks involved with the planned task in order to,

1. Define and identify the dangers and risks involved.
2. For each risk identified assess the risk and specify the necessary control and mitigating measures to be taken.
3. Identify the personnel responsible for implementing them.
4. Re evaluate the risks based on the mitigating measures identified in step 2.
5. Allow for further risk factors (see below) and changing circumstances.
6. Document the result using the [Risk Assessment form FM171](#).
7. Continually review the risks while carrying out the task and amend the safeguards as require.
8. Comply with all relevant permits to work procedures for hot work, cold work, entry into enclosed spaces and working aloft or any other permit to work procedure.

Refer to the flow chart at the end of this procedure.

Risk factors

The following risk factors should always be taken into account when planning a task after having first identified, assessed and scored the risks involved.

The purpose of this step is to decide if the risk is acceptable or not based on the risk factors identified. A risk may be acceptable with a competent crew and reliable equipment, but might not be if the crew is fatigued, or if the weather conditions are unfavourable.

Personnel Factors (PF)	Identify where proper planning, leadership and training are required.
Job Factors (JF)	Identify the standard of equipment or where equipment is not working or cannot be relied on.
Unsafe Conditions (UC)	Identify all unsafe conditions that exist within the working environment and the potential consequences.

Risk Assessment matrix

The risk matrix assessment table is to be used to assess all risks that may be involved in a task including but not limited to,

1. Risk of harm to personnel.
2. Risk of environmental damage.
3. Risk of damage to third parties.
4. Risk of damage to the vessel.
5. Risk of failure of critical equipment.
6. Risk to commercial activities.
7. Risk of damage to reputation.
8. Other risks identified.

Once all of the risks have been identified utilise the matrix to assess the degree of risk involved for each task. The specified Risk Assessment forms are to be used for this purpose.

FORMAL RISK ASSESSMENT MATRIX					
Severity	INCREASING CONSEQUENCES FROM 1 TO 4	INCREASING LIKELIHOOD FROM 1 TO 4			
		1	2	3	4
		Very unlikel y	Unlikel y	Likely	Very likely
1	Minor	1	2	3	4
2	Serious	2	4	6	8
3	Major	3	6	9	12

4	Extreme	4	8	12	16
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Low risk (1-2)

Medium risk (3-6)

High risk (8-16)

Authority to proceed

- The authority necessary to proceed with a task will depend on the risk score calculated from the matrix table.
- On board, the relevant authority to proceed will be based on the highest scoring risk assessment identified. (See below table)
- For shore based risk assessment the authority to proceed will be the responsibility of the department manager.

Authority levels to apply

Risk score	Authority to proceed	Company approval required?
Low Risk	Chief Officer, Chief Engineer	No
Medium Risk	Master	No
High Risk	Manager QSE and Manager Technical Operations must be forwarded the Risk Assessment form for their review prior to proceeding.	Yes As a general rule no high risk operation will be allowed unless the mitigating measures, following a re assessment, have reduced the risk to an acceptable level.

Emergency situations

High risk operations are often required to be carried out at short notice in emergency situations. Although there will often be insufficient time to carry out a formal risk assessment and obtain the necessary authority to proceed the principles of risk assessment are to be followed.

Documentation

The attached Risk Assessment form is to be completed prior to any work commencing and signed by the authorised person, as described above, for the level of risk identified. For work on critical equipment ensure that the section at the end of the form is also completed.

Records and traceability

All Formal Risk Assessments are to be filed in the relevant section of C Experience.

References

PR276 Management of Change

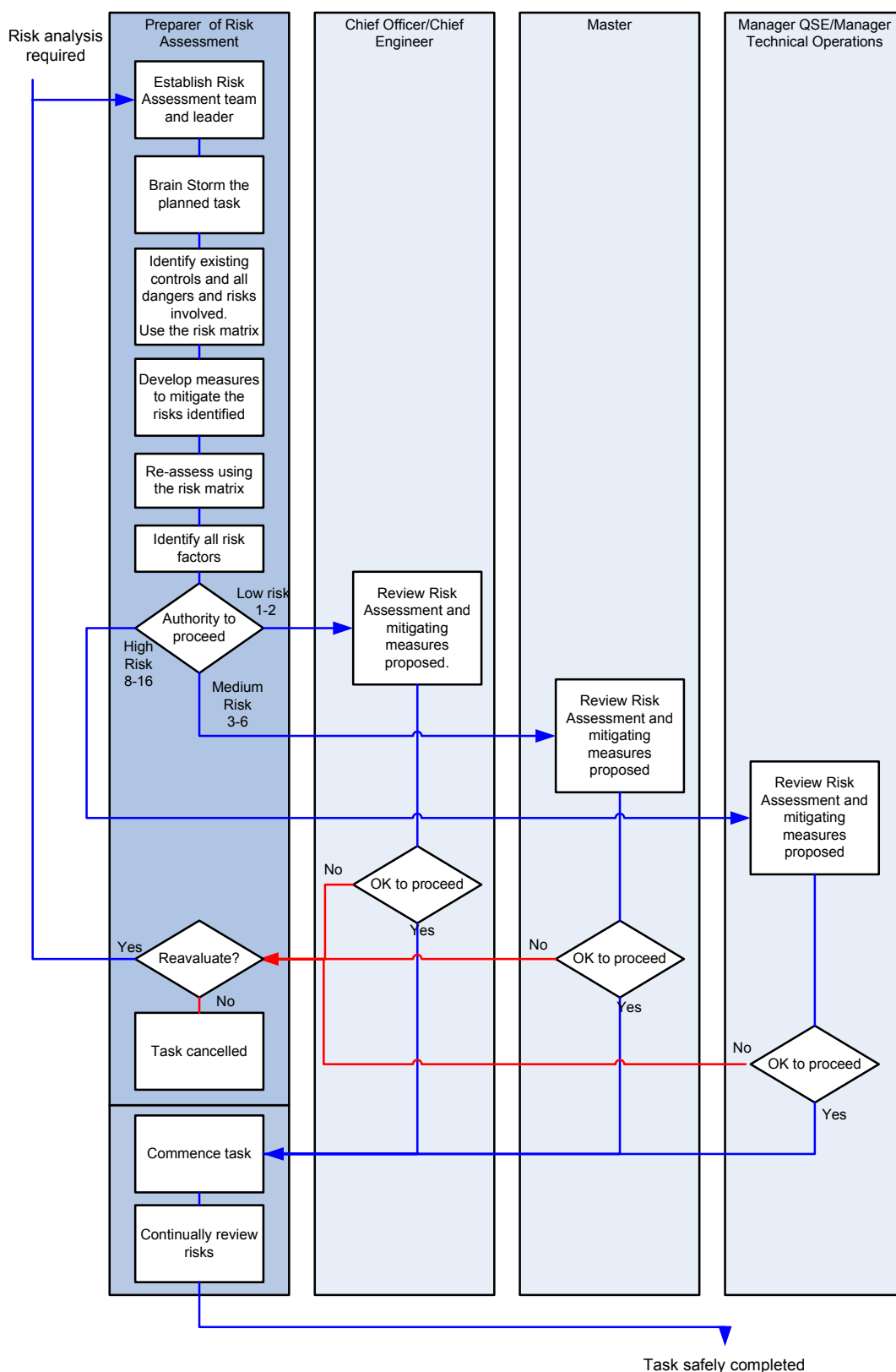
[French Flag Risk Assessment FM160](#)

[Swedish Flag Risk Assessment CL137](#)

Attachments

[Risk Assessment Form FM171](#)

Flow Chart





Risk Assessment Procedure

PR277

Valid from 2009-07-13
Version 4

Tank “Sweeping” Risk Assessment dated 21 February 2010



BROSTRÖM Risk Assessment Form

Valid from 20-04-2009 FM171 Version 3

☐ Non routine

☐ New Routine ☐☐☐ Type of task Routine

7

Vessel	Bro Arthur	Assessment date	2010-02-21
Place	Hamburg		

Description of task
(For work on critical equipment the section at the end of this form must be completed)

Tank Sweeping of Cargo (Palm Oil, Palm stearin)

Risks identified

Ensure all of the following risk types are evaluated

1. Risk of harm to personnel.
2. Risk of environmental damage.
3. Risk of damage to third party assets.
4. Risk of damage to the vessel.
5. Risk of failure of critical equipment.
6. Risk to commercial activities.
7. Risk of damage to reputation.
8. Other risks identified.

Formal Risk assessment matrix					
Severity	Consequences	Likelihood			
		1	2	3	4
		Very un likely	Un likely	Likely	Very likely
1	Minor	1	2	3	4
2	Serious	2	4	6	8
3	Major	3	6	9	12
4	Catastrophic	4	8	12	16

No	Risk type	Description of risk	Severity	Likelihood	Risk scoring
1	1	Risk of falling from vertical ladder	4	4	9
2	1	Risk of asphyxiation	4	3	12
3	1	Risk of skin burn	3	1	3
4	1	Risk of slipping	3	3	9
5	1	Risk of head injury	3	3	9
6	1	Risk of eye injury	2	3	6
7	1	Risk from fumes	2	3	6

Measures taken to reduce the risks identified

No	Description of control measures
1	Use of full body safety harness connected to two fall arrest lanyards with hooks.
	When descending, always to have one hook attached to a strong point.
	Alternative to the lanyards, fall arrest inertia reel to be connect to the harness.
	Only one person on the ladder at all times.

	Check of atmosphere
	Tank entry permit should be issued
	Continue ventilation
	Use of personal gas detector
	Have compressed air BA sets and EEBD standing by outside
	Communication from tank entrance to duty officer.
	Retrieval equipment to be ready
	One person always be standing by at the entrance with radio
	Regular check of atmosphere
	Crew inside the tank should have a radio and report every 5 mins
3	Use of rubber gloves, use of cover all to cover all expose skin.
4	Use of non slipped rubber boots
5	Use of hard hat helmet
6	Use of safety goggles
7	Use of filter mask. Please note that only Chief Officer can issue the use of filter mask and the control of equipment.

Page 1 of 3

UNCONTROLLED DOCUMENT



Risk Assessment Form

Valid from 26.09.2008 FM171 Version 2.02

Reassessment of hazards after risk reduction measures applied

No	Risk type	Residual risks identified	Severity	Likelihood	Risk factor
1	1	Risk of falling from vertical ladder	2	1	2
2	1	Risk of asphyxiation	1	1	1
3	1	Risk of skin burn	1	1	1
4	1	Risk of slipping	1	1	1
5	1	Risk of head injury	1	1	1
6	1	Risk of eye injury	1	1	1
7	1	Risk from fumes	1	1	1

Assessment of the impact of the following risk factors,

Personnel Factors (PF)	Identify where proper planning, leadership and training are required.
Job Factors (JF)	Identify the standard of equipment or where equipment is not working or cannot be relied on.
Unsafe Conditions (UC)	Identify all unsafe conditions that exist within the working environment and the potential consequences.

No	Risk factor type	Description of Risk factors	Description of control measures
1,3	PF/UC	Risk from tripping/sliding	Use Proper PPE, air light to see the ladder and any obstruction
1.3	PF	Risk from wrong use of full body safety harness and fall arrester	Proper training for the use of equipment
2	JF	Failure of Multi gas detector	Calibrate and test before use

Review of measures by authorised person

No	Additional control measure required
1	Look out with communication inside the tank
2	Check of communication equipment
3	Record of number of crew inside the tank and time of entry and out

Prepared by: [REDACTED]

Authority to proceed Yes/No

Time/Date : 21.02.2010

For work on critical equipment the following section to be completed.

Page 2 of 3

UNCONTROLLED DOCUMENT



Risk Assessment Form

Valid from 26.09.2008 FM171 Version 2.02

Additional measures for work on critical equipment. PR248

Equipment or machinery affected	
Equipment PMS code	
Category of equipment, Critical or Sensitive?	
Type of work, regular maintenance or repair?	
PMS job description (JD) number	
Are spare parts available?	
P/O reference	

Alternative back-up equipment/systems Estimated downtime if estimated downtime exceeded. Perform a new Risk Assessment	
Authorised person responsible to carry out the work	

PR201 – Contracting and Using Riding Personnel dated 16 September 2005

CONTRACTING AND USING RIDING PERSONNEL**OBJECTIVE**

This procedure shall ensure that the riding personnel contracted and working onboard on a Broström vessel are well qualified for the intended work they should do and have received sufficient training of applicable Safety and Quality matters before they performs work onboard the vessel.

SCOPE

All personnel involved in Technical and Operational Ship Support.

RESPONSIBILITY

The Technical Manager is responsible for preparation of this procedure and implementation ashore. The Master and Chief Engineer are responsible for the onboard implementation.

IMPLEMENTATION

When contracting a company for work as riding personnel, following should be taken into consideration in addition to what is under Procedure for general Contracting of Supplier and Contractors.

Previous good experience with the specific company supplying riding personnel is to be considered.

At least the foreman(s) in the riding personnel team should be able to communicate in English and/or the flag language.

Before a "new" company is contracted, references must be consulted with a positive reply

The total number of person onboard as stated in the attachment to the safety equipment certificate may never be exceeded while en route

A letter of indemnity should be signed by each member of the riding personnel this letter should be sent in advance to the contracting company for acceptance.

Soonest after that the riding personnel has arrived onboard and before they perform any work familiarisation of vessels safety and quality system should be done.

Same checklists as for new crew should be used. Each member of the riding personnel team is to fill in and sign the checklist and the checklist to be filed. They should also sign a Letter of Indemnity which is to be filed together with the checklist signed.

REFERENCES

[ISM 3, 6](#)

[ISO9001:2000; 6.2.1, 6.2.2, 7.4](#)

ATTACHMENTS

[Familiarisation of the New Personnel – Initial \(CL029\)](#)

[Familiarisation of Riding Personnel \(CL107\)](#)

[Letter of Indemnity \(Application to stay onboard\)](#)

CL107 – Familiarisation of Riding Personnel dated 16 September 2005

Familiarisation of Riding Personnel

Following items to be introduced by the ship's Safety Officer: Yes		No	N/A
Emergency muster list, alarm signals, seating position in lifeboat, safety plan, signs, symbols			
Location and use of personal protective equipment			
Location and use of lifejackets and –belts			
Location and release of fire alarm			
Knowledge of what to do in case of: <ul style="list-style-type: none"> · Man over board · Detection of fire or smoke · Fire alarm, general alarm or abandon ship alarm 			
Knowledge of where smoking is allowed			
Location of emergency exits, muster and embarkation stations			
Emergency escape route from the own cabin			
Knowledge of how to take immediate action upon encountering an accident or other medical emergency			
Closing and opening of fire doors, weather tight and watertight doors.			
Risks involved with the cargo onboard, e.g. inhalation of gases or liquids coming in contact with eyes and/or skin			
Procedures when inspecting tanks and other enclosed spaces			
Oil spill response team			
Alcohol and drug policy(D&A Policy)			
Instruction to report any deficiencies found on board to a responsible Officer			

It is mandatory to inform the Master if you are suffering from a disease, e.g. diabetes, or taking some kind of medicine.

This requirement is intended to:

- Facilitate treatment and or doctor's consultation in case of compliance that may arise,
- Avoid misunderstanding, e.g. at drug tests.

Date: _____

Signature of personnel: _____
Clarification of name: _____

Safety Officer: _____

Emergency Situations Drill Plan (BTFR) from January 2009
until December 2012, updated 1 October 2009

EMERGENCY SITUATIONS DRILL PLAN - BTFR																										
		YEAR	2009												2010											
		MONTH	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Group	Situation N°	Situation Type																								
GROUP 1 :	HEAD OFFICE REACTION																									
	101	Emergency Team																								
GROUP 2 :	DAMAGE TO THE SHIP																									
2.1 - Fire																										
	211	Fire - Explosion																								
2.2 - Damage in the Engine Room																										
	221	Main engine failure																								
	222	Steering gear failure																								
	223	Electrical power failure																								
2.3 - Damage in the Bridge																										
	231	Gyrocompass failure																								
2.4 - Damage to the Hull																										
	241	Collision or Allision																								
	242	Stranding																								
	243	Structure failure																								
	244	Flooding																								
	245	Tank Leakage in DBs, Side Spaces, Cofferdams																								
	246	Submerged / Foundered																								
GROUP 3 :	DAMAGE TO PEOPLE																									
	301	Man overboard																								
	302	Illness - Injury																								
	303	Chemical and Heat burns																								
GROUP 4 :	POLLUTION																									
4.1 - Internal Pollution with Risk of Expansion																										
	411	Cargo Tank Overflow during Loading/Discharging																								
	412	Leaking Cargo Pipe on Deck																								
	413	Spillage Through Cargo Pump Room Sea Valves																								
4.2 - Pollution Spilling out of the Ship																										
	421	Leakage from Hull Plating																								
	422	Cargo Jettisoning																								
GROUP 5 :	NAUTICAL SITUATION																									
5.1 - Emergency Nautical Situation																										
	511	Emergency Towing																								
	512	Abandoning Ship																								
	513	Unberthing in an Emergency																								
	514	Excessive List																								
5.2 - Particular Situation																										
	521	Loss of Anchor																								
	522	Helicopter Operations																								
	523	Stormy Weather – Tropical Storms																								
	524	Lightering																								
GROUP 6 :	UNLAWFUL ACTS THREATENING THE SAFETY OF THE																									
	601	Terrorism or Piracy																								
	602	Stowaways																								
GROUP 7 :	POLLUTION BY CHEMICALS																									
	701	Pollution by Chemicals																								
	702	Gas or Vapour leakage (all products)																								
	703	Dangerous Reactions of Cargo																								
	704	Other Dangerous Cargo Release																								
	705	Loss of Tank Environmental Control																								
	706	Cargo Contamination Yielding a Hazardous Condition																								

EMERGENCY SITUATIONS DRILL PLAN - BTFR

		YEAR	2011												2012											
		MONTH	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Group	Situation N°	Situation Type																								
GROUP 1 :	HEAD OFFICE REACTION																									
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	522	Helicopter Operations																								
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	705	Loss of Tank Environmental Control																								
	706	Cargo Contamination Yielding a Hazardous Condition																								

MAIB Safety Flyer resulting from the *Bro Arthur* investigation

FLYER TO THE SHIPPING INDUSTRY

BRO ARTHUR:

FATALITY OF A SHORE WORKER IN No 2 CARGO TANK



Image courtesy of Broström

Bro Arthur

During the evening of 19 February 2010, a 3-man team of German shore workers entered No 2 cargo tank to “sweep” the remains of a cargo of stearin, a derivative of crude palm oil, into the cargo pump suction well to maximise the cargo discharge. On leaving the tank (**Figure 1**), one of the workers was fatally injured when he fell about 18 metres onto the tank top.

Although a “sweeping” risk assessment had been carried out by the ship, no consideration had been given to the use of a safety harness or fall arrestor despite the extreme waxy nature of the cargo and the advice in the ship’s safety management system regarding their use in large spaces. The supercargo, whose role was to advise the crew on optimal cargo operations, gave two of the shore workers a short brief on the “sweeping” task. However, no safety briefing or other information was passed on by the ship’s officers.

The atmosphere of the cargo tank was tested correctly for oxygen levels but the equipment used to test for other gases only reached half way down the tank. The supercargo noticed that one of the “sweepers”, who was the subsequent casualty, needed help to descend the angled ladders.

Following the accident, the casualty was removed from the tank by the local emergency services, who declined the use of the ship’s recovery equipment because of its weight and lack of portability.

Figure 1

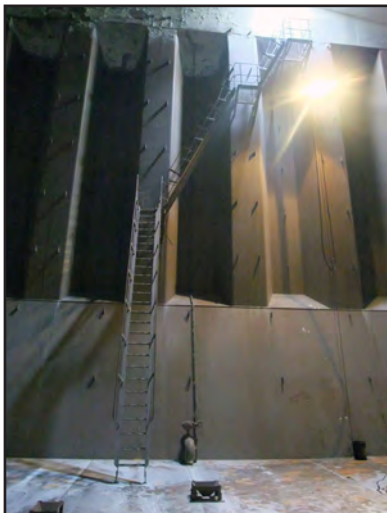


Figure 2



The postmortem toxicology report identified that the casualty had a variety of prescription and illegal drugs in his blood which would have caused severe impairment. All the evidence suggests that the casualty fell from the vertical ladder (**Figure 2**). His heavily cargo-contaminated gloves could easily have caused him to lose his hand grip on the slippery surface and the risk of his falling would have been exacerbated by his impaired physical condition. The investigation also found that the mandatory two-monthly dangerous space casualty recovery drills had not been practised for a considerable time.

SAFETY LESSONS

- While there is a clear responsibility for a worker to take reasonable care of his own health and safety, there should be clear guidance in the ship's safety management system regarding ship's staff responsibilities for effectively controlling and managing contractors.
- If there is any doubt about the physical or professional ability of a person designated to carry out work, regardless of whether they are crew or a contractor, they should be confronted and, if necessary, the task should be aborted.
- Risk assessments need to be thorough if they are to be of use in identifying the most appropriate control measures. When working at height, including entering or exiting cargo tanks, due consideration should be given to the use of safety harnesses or fall arrestors.
- Crew should be equipped with correct atmosphere sampling equipment and be fully trained in its use and interpretation of results. Equipment needs to reach to the bottom of a tank.
- The crew had not been properly trained in rescue techniques and the ship's casualty recovery equipment was unsuitable for the task. Lightweight rapid-deployment tripods and quadpods are commercially available and should be considered.

This flyer and the MAIB's investigation report are posted on our website:

www.maib.gov.uk

For all other enquiries:

Marine Accident Investigation Branch
Mountbatten House
Grosvenor Square
Southampton
SO15 2JU

Tel: 023 8039 5500

Fax: 023 8023 2459

Email: maib@dft.gsi.gov.uk

August 2010

Maersk Tankers Controlled Fleet Information Note – 008/10 dated 4 March 2010



MAERSK Tankers Controlled Fleet Information Notice (CFIN)

Procedure Ref: GSMS -> id 2344 Controlled Fleet information Notice - Tankers

FLEET INFORMATION NO:	008/10
TITLE: UPDATED NOTIFICATION – Fatality during tank sweeping	

TO	Recipient – TANKALL ; CPHTANKOPS; CPHTANKCRU; CPHTANKTOMNG; CPHTANKTOLNG; CPHGASOPS; CPHLNGOPS; CPHTANKTONAU; CPHTANKTOD; CPHTANKTOE; CPHTANKTOFSS; CPHTANKTOSYS; CPHTANKTOADM; SINTANKTOPRO; SINTANKTOCRU; SINTANKTONAU; SINTANKTOHSEQ; GOTBROMAST; GOTBROTO; GOTBROOPS; PARTANKQSE; PARTANKTO; PARTANKOPS; PARTANKMNG; [REDACTED]; MTCIEDU; GBRMTCUKTUT; [REDACTED]; [REDACTED]; MSSHSEQ;
FROM	Maersk Tankers Technical Operation
DATE OF ISSUE	04/03/2010
VALID UNTIL THE DATE OF Max 6 month from the date of issue.	Valid until procedure are entered into safety management system.
EDITOR	[REDACTED]
APPROVAL BY	[REDACTED]
PLEASE ADD COMPANY NOTE TO RELEVANT PROCEDURE NO. IN GSMS	

Purpose and Scope (Tick off relevant)

Relevant Class or Fleet group	Vessel class or fleet group	Relevant Notice	Type of Notice /information/warning
x	LNG		New procedure in progress
x	Floating Gas Storage Unit		Up-date of procedure id
x	Chemical		Technical Flash - Knowledge sharing
x	Small product		Safety Flash - Knowledge sharing
x	Large product		Health Information
x	VLCC	x	Accident/incident investigation in progress
x	Fleet group: CPH		Knowledge sharing – report from accident/incidents
x	Fleet group: SIN		Technical Investigation in progress
x	Fleet group: SWE		Safety investigation in progress
x	Fleet group: FRA		Other – please state : Over ruling a current procedure.

Description:



MAERSK Tankers Controlled Fleet Information Notice (CFIN)

Procedure Ref: GSMS -> id 2344 Controlled Fleet information Notice - Tankers

FLEET INFORMATION NO:	008/10
TITLE: UPDATED NOTIFICATION – Fatality during tank sweeping	

Please be advised that this CFIN supersedes CFIN 006 10

Following the sad news regarding the fatality on board one of our vessels during discharging of palm oil, we can confirm that our internal investigation has now been completed and we would like to clarify the following.

It has been decided that:

Everyone on board Maersk Tankers and Broström tankers without exception is to enter a tank only with a full permit to work and risk assessment carried out.

Also, it is vitally important that absolutely no tank entry is made without full required safety equipment. This must include all appropriate, including PPE and fall arrest systems on all vertical (or near vertical) ladders, extending more than 5 meters vertically in height. Please be advised that as a guide near vertical should be considered to be in excess of 70 degrees to the horizontal, however the vessels trim must also be taken into consideration when making this judgement and not just the surrounding structure.

Fall arrest systems should also be located at all areas in the tank where an unobstructed risk of a free fall of more than 2 meters exist.

Please ensure that that an extraordinary safety management meeting is carried out at the very earliest opportunity, during which it must be discussed how this information and the above requirements can be passed on to every member of the vessels crew to ensure a thorough understanding of the requirements for safe tank entry.

If proper equipment has been identified not to be available on board, please arrange for urgent purchase and again, no entry is made without these measures being in place.

Please also ensure that this is passed on to everyone who joins the vessel.

References



MAERSK Tankers Controlled Fleet Information Notice (CFIN)

Procedure Ref: GSMS -> id 2344 Controlled Fleet information Notice - Tankers

FLEET INFORMATION NO:	008/10
TITLE: UPDATED NOTIFICATION – Fatality during tank sweeping	

Document Control:

The onboard Master, Chief Engineer and all onboard officers must acknowledge the understanding of this CFIN by appending his /her signature on this document.

On -signing Master, Chief engineer and all other Officers must acknowledge the understanding all relevant CFIN's in force by appending their signature on the relevant Handover Checklist. (ref: I-form Id043, Id 209, id 029.)

Rank	Printed name	Signature
Master		
Ch. Engineer		
Ch Officer		
2 nd engineer		
2 nd officer		
3 rd Engineer		
3 rd officer		

Audit trail:

Received CFIN confirmed to [REDACTED]	Date:
--	-------

Amendment to Riken Keiki GX-2009 Personal Gas Monitor Operator's Manual

1. Turn on the GX-2009 as directed in “Start Up” on page 22.
2. Attach the sample adapter plate to the sensor side of the instrument.
3. Screw the probe onto the threaded end of the 10 ft. hose.
4. Attached the 10 ft. hose and probe to the aspirator bulb.
5. Insert the end of the probe into the area to be sampled.
6. Squeeze and release the aspirator bulb 15 times.

Monitor the readings and note if any alarms occur. The readings will peak shortly after the last squeeze and may decrease before all the channels can be checked. To see the maximum readings for each channel, display the peak readings for each channel in Display Mode (see “Display Mode” on page 28).

NOTE: The peak readings for each channel are saved until a higher peak is recorded, the peak readings are reset, or the instrument is turned off. If a gas is present but the level does not exceed the previous peak level, the previous peak will be displayed on the Peak Reading Screen.

Required number of aspirator bulb squeezing

Hose length	Squeezing time
10 ft. (3 meter)	15 times
33 ft. (10 meter)	22 times
66 ft. (20 meter)	32 times
100 ft. (30 meter)	42 times