



# Sharing Lessons Learned from Incidents

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**INTERTANKO**



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## Purpose and scope

The shipping industry has worked hard in recent years to eliminate personal injuries and reduce damage to the environment and assets. Though we have taken big steps towards ensuring that each day ends safely for everybody in our industry, we still need to do more.

In particular, we must make sure that we learn the lessons from incidents. Following any incident, we have programmes and procedures for investigating what happened and why. The point of this work is that we learn from what happened and do all we can to ensure it doesn't happen again.

This information paper outlines the most effective ways that vessel operators can share the lessons that we learn from incident investigations.

It focuses on three levels of sorting and sharing the lessons learned from incidents, and it suggests formats that you can use to record and organise the information.

It also looks at how you can zoom in on the key parts of those lessons, and how to target specific messages at staff so that you do not over-load them with unnecessary information.

Finally, it recommends how to engage people so that they share their personal experiences – a vital factor in ensuring that we all get the maximum benefit from the time and resources we spend on investigating incidents.

For more detailed information and guidance on investigating and reporting incidents see *IMO Code of International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code)*, 2008 edition (resolution MSC.255(84)).

## Contents

|                            |   |          |
|----------------------------|---|----------|
| Purpose and scope          | ii  |          |
| Contents                   | iii   |          |
| Glossary and abbreviations | v   |          |
| <b>1</b>                   | <b>An introduction to the guidelines</b>                  | <b>1</b> |
| 1.1                        | Background: why we need guidelines                        | 1        |
| 1.2                        | Objective: what do we want to achieve?                    | 1        |
| 1.3                        | Intent: what do we want operators to do?                  | 1        |
| 1.4                        | Anti-trust/competition law considerations                 | 1        |
| <b>2</b>                   | <b>An overview of the levels of information sharing</b>   | <b>2</b> |
| 2.1                        | What are the levels of sharing?                           | 2        |
| 2.2                        | What is their purpose?                                    | 2        |
| 2.3                        | How do they work?   | 2        |
| <b>3</b>                   | <b>Immediate incident notification and interim update</b> | <b>3</b> |
| 3.1                        | What is it?   | 3        |
| 3.2                        | What should it contain?                                   | 3        |
| 3.3                        | When should it be used?                                   | 3        |
| 3.4                        | Who should receive it?                                    | 3        |
| 3.5                        | How should it be used?                                    | 3        |
| 3.6                        | How should it be verified?                                | 3        |
| 3.7                        | Where is the template?                                    | 3        |
| 3.8                        | Where are the examples?                                   | 3        |
| <b>4</b>                   | <b>Lessons learned from an incident investigation</b>     | <b>4</b> |
| 4.1                        | What is it?   | 4        |
| 4.2                        | What should it contain?                                   | 4        |
| 4.3                        | When should it be used?                                   | 4        |
| 4.4                        | Who should receive it?                                    | 5        |
| 4.5                        | How should it be used?                                    | 5        |
| 4.6                        | How should it be verified?                                | 5        |
| 4.7                        | Where is the template?                                    | 5        |
| 4.8                        | Where are the examples?                                   | 5        |
| <b>5</b>                   | <b>Lessons learned from a review of incident trends</b>   | <b>6</b> |
| 5.1                        | What is it?   | 6        |
| 5.2                        | What should it contain?                                   | 6        |
| 5.3                        | When should it be used?                                   | 6        |
| 5.4                        | Who should receive it?                                    | 6        |
| 5.5                        | How should it be used?                                    | 6        |
| 5.6                        | How should it be verified?                                | 7        |
| 5.7                        | Where is the template?                                    | 7        |
| 5.8                        | Where are the examples?                                   | 7        |

|                    |  |           |
|--------------------|--|-----------|
| <b>Appendix A1</b> | Template of immediate incident notification and interim update | <b>8</b>  |
| <b>Appendix A2</b> | Examples of immediate incident notification and interim update | <b>9</b>  |
| <b>Appendix B1</b> | Template of lessons learned from an incident investigation     | <b>11</b> |
| <b>Appendix B2</b> | Examples of lessons learned from an incident investigation     | <b>12</b> |
| <b>Appendix C1</b> | Template of lessons learned from a review of incident trends   | <b>18</b> |
| <b>Appendix C2</b> | Examples of lessons learned from a review of incident trends   | <b>19</b> |

## Glossary

The following are agreed definitions for terms used within this paper.

**Best practice** Methods of working or procedures to aspire to as a part of continuous improvement.

**Guidance** Provision of advice or information.

**Recommendations** Support and endorsement of a particular method of working or procedure.

## Abbreviations

|     |                                     |
|-----|-------------------------------------|
| IMO | International Maritime Organization |
| LET | Learning Engagement Tool            |

# 1 An introduction to the guidelines

## 1.1 Background: why we need guidelines

Vessel operators have different ways of managing the lessons learned from incidents. Some have detailed programmes, while some use simpler procedures. In either case, an operator's response will have evolved over time to suit its own organisational structure and needs.

While each of these programmes has its pros and cons, we felt we needed to assemble a clear and universal set of guidelines that operators could follow in order to share the lessons that these programmes expose. The big advantage for operators of following the guidelines is that, no matter what programme you use, they will help you to get the full value of the resources you spend on investigating incidents.

Most importantly, the guidelines will ensure that the lessons learned are meaningful to the people who matter the most – the crew and other staff. This in turn will help you to prevent repeat incidents and to promote a working culture that prizes safety.

## 1.2 Objective: what do we want to achieve?

To encourage vessel operators to use three different levels of sharing the lessons learned from incidents. The focus is on identifying the vital content of the lessons, the key audience for those messages, the processes that need changing and the revised expectations on safety. To help clarify and support this process, we have provided templates and examples.

## 1.3 Intent: what do we want operators to do?

We ask that operators review this document, understand the purpose of the different levels of information sharing, and adopt best practice by using the templates as far as possible to report the results of their incident investigations.

Crew members can also use these templates to reflect and consider the question, “What if this had happened to us?”. What could they have done differently to avoid a similar situation?

We do not expect individual operators to use every template, but rather to focus on those that work best at encouraging the process of sharing so that it becomes a personal experience for staff.

## 1.4 Anti-trust/competition law considerations

Vessel operators are recommended to review their lessons learned from an anti-trust/competition law perspective before sharing them. As a general rule:

- Only include facts that have to be included to describe the incident.
- Do not name commercial organisations, e.g. suppliers, manufacturers and operators.
- If naming commercial organisations is unavoidable, make sure comments are objective and not judgemental.

## 2 An overview of the levels of information sharing

### 2.1 What are the levels of sharing?

They are different ways of recording and ranking the lessons learned from incidents. The three levels are:

- Immediate incident notification and interim update.
- Lessons learned from an incident investigation.
- Lessons learned from a review of incident trends.

### 2.2 What is their purpose?

To help vessel operators share the relevant lessons from incident investigations at the right time and in a meaningful way. They focus on the key content and avoid providing too much information. Sharing the lessons learned in this way will help us to build and improve the safety culture within our industry.

### 2.3 How do they work?

Each level represents a different stage of the information-sharing process after an incident. They show how to share the lessons in a way that has the best impact on the targeted audience, making it a personal experience for them.

#### 2.3.1 Immediate incident notification and interim update

This notification is made as soon as possible after an incident. It gives a short description of the known facts, and states what relevant operations will be reviewed or suspended, or what specific action will be taken. Depending on the incident and the key points it highlights, this notification should be sent to shore-based staff, fleet staff or a group of vessels likely to have similar issues. If any further relevant facts emerge, they are shared as an 'interim update' using the same notification template.

#### 2.3.2 Lessons learned from an incident investigation

These lessons are shared after the investigation into the incident has finished. They focus on the key learning from the investigation rather than every single finding, recommendation or corrective step. This level summarises the main points and allows for personal reflection among staff, which in turn reinforces the key lessons. Depending on the incident and the points to be highlighted, it is either sent to all staff or just the relevant groups.

#### 2.3.3 Lessons learned from a review of incident trends

These lessons are shared after a review or analysis of a series of incidents where a trend emerges – for example, lifeboat-related incidents. This level focuses on the key elements that have contributed to the trend, and sums up the information to help reinforce the learnings for each topic. Resources such as the Learning Engagement Tool (LET) help to promote discussions in small groups, which can lead to learning that has a more personal perspective.



## **3 Immediate incident notification and interim update**

### **3.1 What is it?**

It is a way of informing fleet staff of an incident and the immediate action needed to prevent a repeat. It can also be used to share any further facts that become available, which is known as an interim update.

### **3.2 What should it contain?**

Keep it short and to the point. The sort of information it should cover includes:

#### **3.2.1 An incident description**

State what kind of incident it was, and briefly describe what happened, using only the facts known at the time. Also use photographs if they are available.

#### **3.2.2 The immediate action to be taken**

Set out the steps that fleet staff need to take – e.g. additional checks, suspend certain activities, stop using particular equipment on board, raise awareness through safety meetings, etc.

#### **3.2.3 A feedback loop**

Ask for confirmation that fleet staff have received and discussed the report, and that they have taken the necessary action.

### **3.3 When should it be used?**

As soon as possible after factual details of the incident become clear. It can also be used as an interim update to share any further facts that emerge at a later date.

### **3.4 Who should receive it?**

All relevant fleet staff, office staff and management staff.

### **3.5 How should it be used?**

Operators should use it to share known facts about significant incidents and the action necessary to prevent similar incidents on other vessels.

### **3.6 How should it be verified?**

Use a feedback loop to ask for confirmation that fleet staff have received the incident notification and that they have taken the required action.

### **3.7 Where is the template?**

See appendix A1.

Although we recommend that all operators use the template, you may prefer to continue using your existing format. In this case, we recommended that as a minimum you include the information asked for in the template.

### **3.8 Where are the examples?**

See appendix A2.

## 4 Lessons learned from an incident investigation

### 4.1 What is it?

It is a way of informing fleet staff of the details of an incident and the outcome of the investigation, including the key lessons learned. It can help to raise safety awareness and promote a strong safety culture.

The purpose of this level of sharing is to:

- Identify any weaknesses and gaps in existing procedures and arrangements, and to set out steps for putting them right.
- Show examples of good practice in existing procedures.
- Encourage a proactive approach among staff to safety on board and ashore. This would include identifying hazards and taking measures to prevent any repeat of the incident.

### 4.2 What should it contain?

The sort of information it should cover includes:

#### 4.2.1 An incident description

- Give a factual narrative report of the incident and the key issues related to it.
- Add photographs, if available. These can add a lot of value to the description of the incident, which can reinforce the message of the lessons learned.

#### 4.2.2 The potential outcome

Identify the 'top event' – the moment when control would be lost over the hazards, leading to a high risk of extensive harm or damage. The aim is to define the worst-case scenario and then set out the contingency plan for avoiding it.

#### 4.2.3 The causes

Summarise the immediate and root causes of the incident.

- The immediate causes: substandard acts or conditions that led directly to the incident, e.g. a machine guard was removed, personal protective equipment was misused, there was stress or fatigue, or poor concentration or housekeeping.
- The root causes: what the investigation identifies as the initial events or failings that led to all the other causes or failings. Had this initial event or failing been controlled, the incident would have been prevented. The root causes are often linked to flaws in management systems.

#### 4.2.4 Corrective and preventative actions

Explain the steps that were taken to remedy the impact of the incident and the action needed to prevent it from happening again. These measures will be connected to the identified causes of the incident.

#### 4.2.5 Team engagement and discussion topic

Use open-ended questions (What, How, etc.) to encourage staff to discuss the key messages from the incident investigation. The aim of this is to reinforce existing procedures and to identify extra measures to prevent a repeat of the incident. Try to make it a personal experience for staff by building in techniques such as reflective learning.

### 4.3 When should it be used?

After the incident investigation. A review of the findings will identify the key lessons learned and the action to be taken.

#### **4.4 Who should receive it?**

Depending on the incident and the key lessons, either send it to all staff or tailor it to the relevant groups.

#### **4.5 How should it be used?**

Use it to share the key messages from the incident analysis. This should prompt discussions among small groups of staff. Building in techniques such as reflective learning will help to ensure that staff understand and remember the lessons learned. The overall aim is to reinforce existing procedures and to identify any further measures that might help to prevent a repeat incident.

#### **4.6 How should it be verified?**

Use a feedback loop:

- Ask for confirmation that staff have received and discussed the report.
- Also ask for confirmation that they have taken the required action.
- Use senior management visits to evaluate the lessons learned.

#### **4.7 Where is the template?**

See appendix B1.

Although we recommend that all operators use the template, you may prefer to continue using your existing format. In this case, we recommended that as a minimum you include the information asked for in the template.

#### **4.8 Where are the examples?**

See appendix B2.

## 5 Lessons learned from a review of incident trends

### 5.1 What is it?

It is a way of informing fleet staff about a trend identified from a review of investigation reports into your own or industry-wide incidents. It also a way of telling them about the steps needed to reverse the trend.

### 5.2 What should it contain?

The sort of information it should cover includes:

#### 5.2.1 A summary of the trend

- Describe the events in brief.
- Categorise the trend. It might be the same or similar:
  - Incident types.
  - Root causes.
  - Contributory factors.
- Provide photographs, drawings, sketches and plans, if available.

#### 5.2.2 A list of the common causes

- Explain the common causes identified by the review or analysis.

#### 5.2.3 An overview of the lessons learned

- Summarise the lessons identified and documented by the original incident investigations.

#### 5.2.4 Corrective action to reverse the trends

- Raise awareness of the trend among crews, shore staff and contractors as necessary, e.g. safety meetings, safety stand-downs, etc.
- Describe the steps that they should take to help reverse the trend.

### 5.3 When should it be used?

After a review or analysis of your own or industry-wide incidents has identified a trend in a particular area.

### 5.4 Who should receive it?

Depending on the trend and the key lessons, either send it to all staff or tailor it to the relevant groups.

### 5.5 How should it be used?

Use it to engage staff and encourage them to discuss the issue.

Draw up questions that will help staff think about how the issue affects them and how they can help to reverse the trend. Frame the questions so that they make the issue personal to each member of staff. Resources such as the LET can help you do this.

### 5.6 How should it be verified?

Use a feedback loop:

- Ask for confirmation that staff have received and discussed the report.
- Also ask for confirmation that they have taken the required action.
- Use senior management visits to evaluate the lessons learned.

## **5.7 Where is the template?**


See appendix C1.

Although we recommend that all operators use the template, you may prefer to continue using your existing format. In this case, we recommended that as a minimum you include the information asked for in the template.

## **5.8 Where are the examples?**


See appendix C2.

## Appendix A1 Template of immediate incident notification and interim update


|  |   |
|--|---|
| <b>LOGO</b>  | <b>Immediate Incident Notification Report</b><br><b>Title - Interim update (delete as required)</b> |
| <b>ID:</b>   | <b>Incident categorisation:</b>   |
| <b>Date/time:</b>  | <b>Incident description:</b>  |
| <b>Activity:</b>   |   |
| <b>Location:</b>   |   |
| <b>Immediate actions to be taken:</b>  |   |
| <b>Photo:</b> <i>Description of photo</i>  |   |
|  |   |

**Figure A1.1:** *Template of immediate incident notification and interim update*

## Appendix A2 Examples of immediate incident notification and interim update

|   |  |
|---|--|
| LOGO  | <b>IMMEDIATE ACCIDENT INCIDENT NOTIFICATION</b>  |
| <hr/>   |  |
| <b>Incident categorization</b>  | : <b>Equipment Damage/ Aux. Engine Equipment</b> |
| <b>Date/time</b>  | : xxxxx/xxxxxx                                   |
| <b>Activity</b>   | : Engine room operation                          |
| <b>Location</b>   | : Engine room                                    |
| <b>ID</b>   | : xxxxxx   |
| <b>Incident description:</b>  |  |
| <p>Please be informed that a major defect/damage occurred on a D/G of M/T xxxx.<br/>During operation of engine the connecting rod bolts broken. As a result, the connecting rod broke away from the crankshaft and broke through the block of the engine.</p>   |  |
| See below photos of the damage:   |  |
|    |  |
| <b>Immediate actions to be taken:</b>   |  |
| <p>The following actions/checks must be performed as soon as possible to all AUX ENGINES ONE BY ONE:</p> <ol style="list-style-type: none"><li>1. Check tightness as per makers instructions for COUNTERWEIGHTS NUTS .</li><li>2. Check tightness as per makers instructions for CONNECTING RODS NUTS.</li><li>3. Check tightness as per makers instructions for MAIN BEARINGS NUTS.</li><li>4. Proceed to a general inspection of engine crankcase and revert with your findings comments.</li></ol> |  |
| <p>Following the above checks and inspections, the results to be reported until ..... (date) the Technical Department.</p>  |  |

**Figure A2.1:** First example of immediate incident notification

|   |   |
|---|---|
| <h1>LOGO</h1>   | <h2>Immediate Accident Notification Report</h2> <p style="color: red;">Fleet Injury Alert, 4 Engine crew suffered Face and Skin Burns</p>   |
| ID:   | Incident categorization: Injury   |
| Date/Time:  | Incident Description: 4 Engine crew members were tasked to clean / inspect a F.O. supply pump for the aux. boiler when suddenly high temperature fuel oil and pressurized gases escaped, during opening the relevant filter. The fuel oil and the pressurized gases caused injuries to our following colleagues:<br>2nd Engineer, suffered 2nd Degree burns, 1 Wiper, suffered 2nd degree burns, 1 Wiper, suffered 1st degree burns, 1 App. Engineer, suffered 1st degree burns |
| Activity:   |   |
| Location:   |   |
| <b>Immediate actions to be taken:</b><br>1. The provisions of this ALERT should be brought to the attention of all crew, in particular to those who are involved with the maintenance of machineries.<br>2. Responsible officers and supervisors to ensure that similar works are undertaken with the outmost safety awareness by providing efficient supervision ensuring effective communications, tool box meetings and implementation of company's procedure SMS Ch. 7.8 "Control Of Hazardous Energy".<br>3. Please conduct an ad-hoc meeting and provide the minutes of same in due course. |   |
| <div style="display: flex; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span style="color: red;">Incident demonstration</span> <span style="color: red;">aux boiler Fuel oil pump</span> </div>   |   |

**Figure A2.2:** Second example of immediate incident notification

Dear captains,

Few days ago and during STS mooring operations a mooring wire of one of our vessels failed just under the splice with no tension to it.

The following was received by the master:

Quote

During the STS mooring operation, headline mooring wire was broken during the making fast.

The eye of the wire was broken, on the way down between two vessel. Breaking point was just below it of splice part of wire, facing inside it of the eye of the wire.

Weather condition was satisfied, mooring operation agreed from both vessels.

Mooring wire reverse it end to end. Eye of wire examined and check for any damages. Found it ok and crew proceed for making fast of the wire. Headline made fast.

There was no injured personnel, no any delays.

Unquote


Thanks to review SP.10.16 paragraph 6.3.1 and perform and additional inspection (to be recorded in PMS)

With kindest regards

**Figure A2.3:** Third example of immediate incident notification

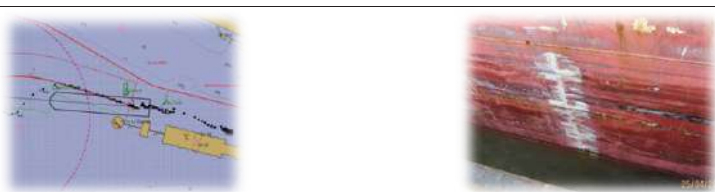


## Appendix B1 Template of lessons learned from an incident investigation

|  |   |
|--|---|
| <b>LOGO</b>  | <b>Lessons Learned from an Incident Investigation</b><br><span style="color: red;">Title</span> |
| <b>ID:</b><br><br><b>Date/time:</b>  | <b>Incident description:</b>  |
| <b>Potential outcome:</b>  | <b>Causes (immediate, root causes):</b><br><br><b>Corrective actions/preventative actions:</b>  |
| <b>Lessons learned:</b>  |   |
| <b>Team engagement and discussion topic:</b><br><b>Question 1:</b><br><b>Question 2:</b> |   |
| <b>Photo:</b> <i>Description of photo</i>  |   |
|      |   |

**Figure B1.1:** *Template of lessons learned from an incident investigation*

## Appendix B2 Examples of lessons learned from an incident investigation

| Lessons Learned from Incident Investigation |   |
|---|---|
| <b>ID: 2017-01</b>                          | <b>Contact with mooring dolphin during berthing</b>   |
| <b>Incident description:</b>                | On (date) at xxx:xx hrs local time, while a fleet Afamax tanker was berthing at the port of xxxxxxxxxxxx, under Pilotage with the assistance of three tugs, the vessel made contact with the forward mooring dolphin causing a side shell indentation in way of WBT 5P. Fortunately, no any damage was caused to the terminal. Class attended and verified that the vessel was fit to proceed until next dry docking. Loading operations commenced and completed uneventfully on (date). Permanent repairs to the satisfaction of Class were performed at the port of xxxxxxxx on (date).   |
| <b>Photos</b>                               |   |
| <b>Potential Outcome:</b>                   | Such an incident, under different circumstance, could have resulted in breach of hull and terminal damage   |
| <b>Causes:</b>                              | <p><u>Immediate cause:</u> Improper berthing manoeuvre (the vessel's astern movement was conducted at a very close distance to the jetty. As such when the vessel's port quarter passed the mooring dolphin the sudden wind gusting caused her aft part to swing to starboard and the port side shell to come in contact with the dolphin).</p> <p><u>Root Cause:</u> Inadequate planning and risk assessment of berthing operation (the wind effect on the superstructure and the possibility of a sudden gust had not been foreseen in planning the berthing maneuver and as such a sufficient safety distance to allow the time to the tugs to correct the vessel's position/heading had not been provided)</p>  |
| <b>Corrective/ Preventive Actions</b>       | <p>1. This Lessons Learned report to be:</p> <p>(a) circulated to the fleet vessels and be discussed at an ad-hoc on-board meeting with the navigating officers (Responsible: Master, target date: 30/05/2017).</p> <p>(b) included in the agenda of the shore training "Sharing experience from incidents" which is carried out one 3-monthly basis (Responsible: Training Officer, target date: 30/06/2017).</p> <p>2. The Company's Risk Assessment on "mooring operations" to be reviewed in light of this incident (Responsible: SQ Manager, target date: 30/06/2017).</p>   |
| <b>Key message</b>                          | Proper planning and risk assessment are critical parameters in ensuring safe operations   |
| <b>Lessons Learned</b>                      | <p>Approaching at port and mooring is a risky operation involving a number of various and fast-changing parameters and factors. Therefore, the approach and berthing maneuvering must be subject to a proper planning and risk assessment which should be discussed and agreed with the Pilot having taken into account all prevailing and anticipated conditions and berth characteristics.</p> <p>Ship personnel should be well prepared not only to implement properly the safety and risk control measures already established but to assess and react effectively to any new hazard that might occur. Even under pilotage, the Master remains responsible for the safety of the vessel and he should thus ensure that all Pilot's actions/orders are carefully and closely monitored and assessed. The Master should not hesitate to take prompt action so that to ensure at all times smooth and safe mooring operations.</p> |
| <b>Team engagement/discussion topics</b>    | <ul style="list-style-type: none"> <li>What type of incident could occur during vessel's berthing?</li> <li>How can incidents be avoided during vessel's berthing?</li> <li>Have you ever experienced a similar incident and what were the causes?</li> <li>Which behaviours can we pay particular attention to so that we can avoid an incident?</li> </ul>  |

**Figure B2.1:** First example of lessons learned from an incident investigation

# LOGO

## Experience Shared – Lessons Learned from Incident Engine crew suffered Face and Skin Burns

ID:

Date/Time:

**Incident Description:**  
 The vessel was anchored at Rio de Janeiro where a routine maintenance on the No1 fuel oil pump of the auxiliary boiler had been scheduled.  
 The maintenance work commenced on June 1st, 2017 at 13:30hrs LT.  
 At around 13:40 the 2nd Engineer was about to dismantle and remove the pump’s filter cover, when all of a sudden hot fuel and gases escaped from the pump.  
 The 2nd Engineer, two wipers and one engine cadet who were involved with the specific work suffered burns on their faces, skin neck and hands, from the escaped hot oil spayed.  
 All injured crew were offered first aid on board and they immediately transferred to the local hospital for further treatment and medical examinations.  
 The doctor’s initial medical diagnosis included among others, the following:

2nd Engineer: “suffered 2nd degree burns on the right hand, right forearm, right arm, neck, upper and lower lip, nose, upper and lower eyelids, ears (severe burn in the right ear), upper third, middle and lower face and chest upper anterior”.

Wiper1: “suffered 2nd degree burns on upper & lower lips, nose, upper & lower eyelids, both ears, upper, middle and lower face, anterior neck and upper anterior chest”.

Wiper2 & Engine cadet: “suffered first-degree burns that involves superficial epidermis”.

**Potential Outcome:**

**Serious injury, Permanent partial or total disability, Loss of life, Fatality,**

**Causes : (Immediate, Underlying, Root causes)**

**Immediate Causes:**

- Unsafe act: The pump switched to manual control and secured in stop position, it was also isolated by closing the inlet and outlet valves. Although the pump delivery pressure indicated 1.5 Bar the 2nd engineer proceeded with removing the bolts of the filter cover without releasing the pressure from the vent cock.
- Unsafe condition: Working on a pressurized system. The system was not properly depressurized. The residual pressure allowed the hot fuel and gases to escape whilst being serviced.
- Personal factors: Overconfidence and complacency prevented the crew to identify the developed risk and the risk awareness was compromised.
- Job factors: Inadequate work planning/ inadequate supervision during the work. The crew showed not adequate understanding of the developed pressure into the system and the potential consequence. Consequently, the task was not adequately planned and executed. The requirements of permits to work were not thoroughly executed e.g., while the Permit to Work “P 004 pressure vessel / pipeline work permit on Pressurized Systems” required release of the pressure, same had been ticked without actual pressure release.

**Root cause:** Non compliance with the existing procedures.



**Corrective Actions/Preventative Actions:**

**CORRECTIVE ACTIONS**

1. In accordance with the doctor's diagnosis the 2nd Engineer and the wiper remained at local hospital for further treatments and repatriated on June 11th 2017. A new 2nd Engineer immediately joined the vessel right after the incident on June 2nd 2017 and took over his duties, whilst the ship was still at Rio De Janeiro anchorage.
2. A Safety ad hoc meeting carried out on board on June 2nd 2017, with the participation of all crew with the aim to enhancing the safety awareness and continuous diligence. During the captioned meeting specific reference was made to the company' procedures Ch.7.8 for the control of hazardous energy and the permits to work procedures.
3. All fleet vessels were immediately notified on June 2nd 2017, and were asked to conduct an ad-hoc training and safety meeting highlighting the importance of permit to work and the associated hazards with the pressurized systems.

**PREVENTATIVE ACTIONS**

1. This investigation report along with the relevant lessons learnt report to be disseminated to all fleet vessels and be discussed at the shipboard Safety Committee Meeting.
2. This investigation report will be discussed during the in-house incident investigation and lessons learned training sessions and during the Senior Officers briefing and de-briefing process.
3. All fleet Masters with the assistance of Chief Engineers, to conduct a refresher training towards the company's procedures Chapter 14 permits to work.
4. All fleet vessels to deliver on board the Learning Engagement Tool "Personal Injury", with the aim to discuss key issues relating to the specific theme and how to prevent similar incidents from happening.
5. A specific Risk Assessment to be developed providing mitigating actions to be taken for the associated hazards on the maintenance and overhauling of fuel oil pumps.
6. A technical service experience letter will be issued providing details and precautions to be taken whilst working on similar type of fuel oil pumps.
7. At least 25% of fleet to be inspected towards an Engineering audit by Technical Superintendents.

**LESSONS LEARNED:Root Causes:**

As it is known all work activities onboard including the routine ones present hazards. Potential hazards associated pressurized pipelines and machineries should be identified and the relevant risk should be controlled through the risk assessment methodology. RA review should be carried out prior to every work activity during a "tool box" safety meeting and should be participated by all personnel involved.

The work permits are to be efficiently executed and thoroughly implemented.

Supervisors should no ne destructed with tasks and should ensure that the wok is being carried out safely.

Specific works/jobs are to be assigned to experienced personnel, well familiar with the equipment.

Stay always aware of the hazards. Remain alert and focus on doing the job safely. Follow the work permits at all times. Do not take shortcuts and use the appropriate PPE.

Do not hesitate to STOP unsafe acts and intervene when you think that safety is being compromised.

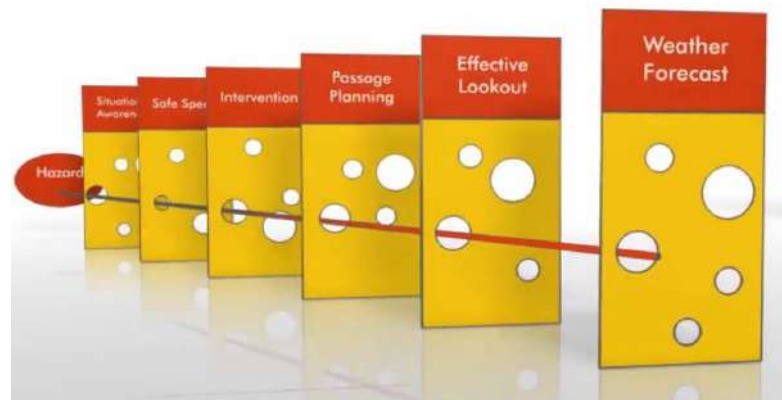
Develop and follow your own safety habits in the daily work routine. Set the safety bar high. Be a good safety example for others to follow.

**TEAM ENGAGEMENT AND DISUCSSION TOPIC:**

1. All fleet Masters with the assistance of Chief Engineers, to conduct a refresher training towards the company's procedures Chapter 14 permits to work.
2. All fleet vessels to deliver on board the Learning Engagement Tool "Personal Injury", with the aim to discuss key issues relating to the specific theme and how to prevent similar incidents from happening.
3. Hazards/exposures to burns onboard and mitigating measures.

**Figure B2.2:** *Second example of lessons learned from an incident investigation*

## Reflective Learning Tool



# LEARNING FROM INCIDENTS

## Collective Normalisation

In groups list the barriers that failed leading to this incident?

How do you ensure these barriers do not fail in your location?

Menu



NEXT >

**Figure B2.3:** *Third example of lessons learned from an incident investigation*



## Appendix C1 Template of lessons learned from a review of incident trends

|   |   |
|---|---|
| LOGO  | <p><b>Lessons Learned from a Review of Incident Trends</b></p> <p>The information below is produced based on reviews of own and or industry incident investigation reports.</p>                           |
| <p><b>ID:</b></p>                                       | <p><b>Description of the common incident related trends:</b><br/> <i>Describe the common types of incidents that are occurring and other specific information related to these types of incidents</i></p> |
| <p><b>Time period:</b></p>                              |   |
| <p><b>Common causes:</b></p>                            |   |
| <p><b>Overview of lessons learned:</b></p>              |   |
| <p><b>Corrective actions to reverse the trends:</b></p> |   |
| <p><b>Team engagement and discussion topic:</b></p>     |   |

**Figure C1.1:** *Template of lessons learned from a review of incident trends*

## Appendix C2 Examples of lessons learned from a review of incident trends

### Lessons Learned based on Trend Analysis

| ID: 2017-01   | Description of the incident related trends  |
|---|---|
| <p><b>Time Period:</b><br/>2Q-2017</p>  | <p><b>During Q2 2017 there was an increased trend of accidents involving contact with the terminal dock/jetty/mooring installations during berthing maneuver. For example:</b></p> <p>On .... (date) at .... hrs local time, while a fleet vessel was berthing at the port of ....., under Pilotage with the assistance of three tugs, the vessel made contact with the forward mooring dolphin causing a side shell indentation in way of WBT 5P. Fortunately, no any damage was caused to the terminal. Class attended and verified that the vessel was fit to proceed until next dry docking. Loading operations commenced and completed uneventfully on ..... (date). Permanent repairs to the satisfaction of Class were performed at the port of ..... on .... (date).</p>  <p>On .... (date) while a fleet vessel was performing a turning circle maneuver in order to berth with her starboard side alongside at ....., Terminal with Pilot on board and the assistance of three tugs her bulbous bow softly contacted with the dock structure causing a dent in the port side of the bulbous bow. Minor damages to the terminal infrastructure were alleged to have been caused. Class attended and issued a COC for the damage to be repaired within 3 months. Loading operations commenced and completed uneventfully on .... (date).</p>  |
| <p><b>Common Causes:</b><br/>           Immediate cause: Improper berthing maneuver<br/>           Root cause: Inadequate planning and risk assessment of berthing operations.</p>  |   |
| <p><b>Overview of Lessons Learnt:</b><br/>           Approaching at port and mooring is a risky operation involving a number of various and fast-changing parameters and factors. Therefore, the approach and berthing maneuvering must be subject to a proper planning and risk assessment which should be discussed and agreed with the Pilot having taken into account all prevailing and anticipated conditions and berth characteristics.</p> <p>Ship personnel should be well prepared not only to implement properly the safety and risk control measures already established but to assess and react effectively to any new hazard that might occur.</p> <p>The master when planning his maneuver should take into consideration:</p> <ul style="list-style-type: none"> <li>• The greater effect the wind's force and direction has on the ship superstructure, relative to its trim, draft, and speed, along with the factors governing the pivot point which in turn depends on the ship's motion ahead or astern. These factors will indicate the proper positions for securing the tugs and how they can be used in the most effective way.</li> <li>• The advantage of the propeller's turning effect (or transverse thrust) specifically when vessel's speed is minimum.</li> <li>• The vessel's position at the commencement of berthing maneuver in relation to the longitudinal axis of the jetty/ berth especially when weather conditions are not favorable and pulling power of tug boats is limited.</li> <li>• The "shallow water" effect on turning that will significantly increase the turning circle and stopping distance and time. In cases where the under keel clearance is small (less than 4 meters) the engine and rudder responsiveness will be also affected Master should ensure that tugs potential is exploited to fullest.</li> </ul> |   |

Issued on: 15 June 2017

Page | 1

## Lessons Learned based on Trend Analysis

Vessel's movement during port maneuvering must be monitored closely by the officers in charge at mooring stations and information should be passed to the bridge in respect to distance and clearance from fixed objects and other navigation hazards.

Even under pilotage, the Master remains responsible for the safety of the vessel and he should thus ensure that all Pilot's actions/orders are carefully and closely monitored and assessed. The Master should not hesitate to take prompt action so that to ensure at all times smooth and safe mooring operations.

### Corrective Actions to reverse the trend:

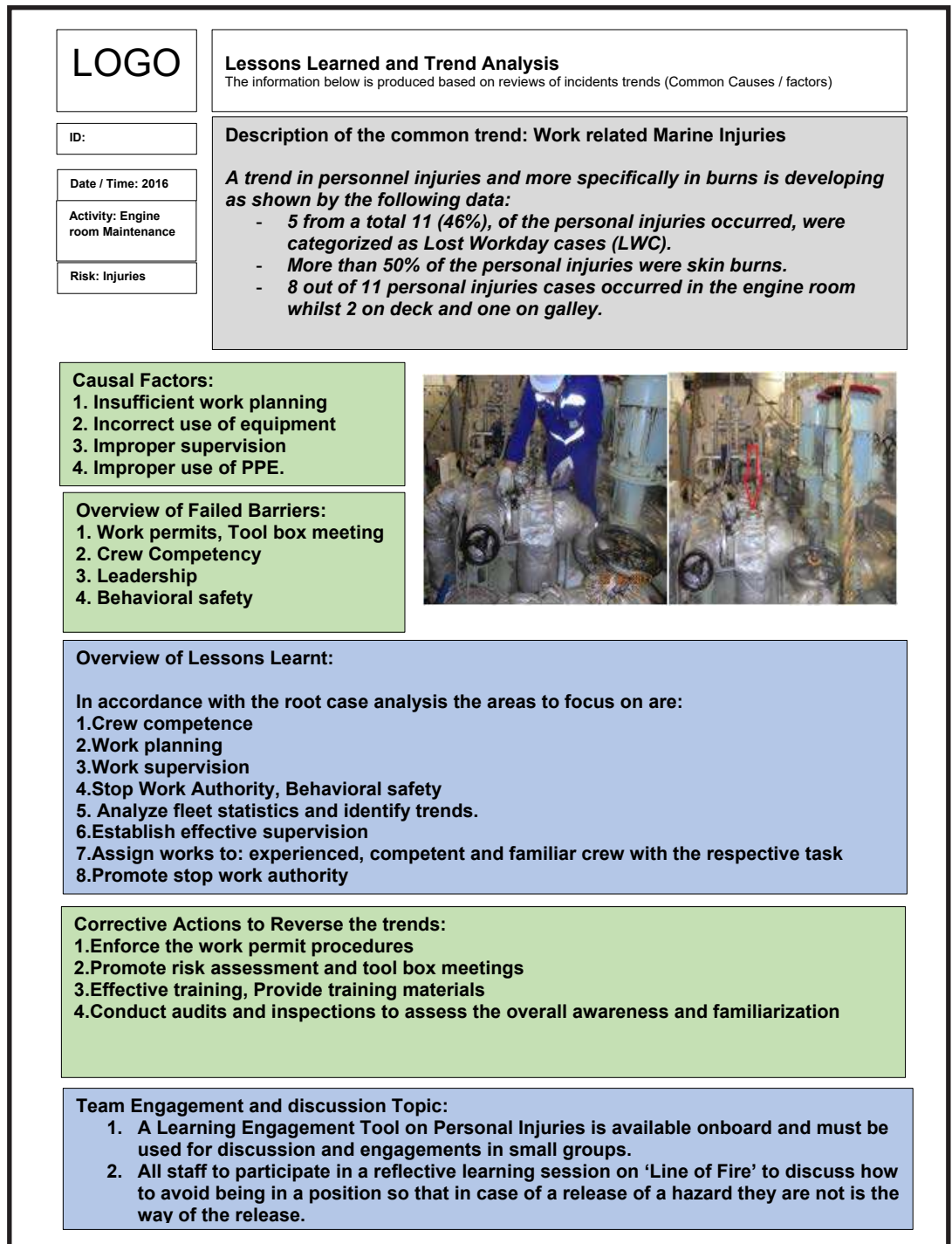
1. This "Incident Trend Analysis" to:
  - (a) be circulated to all fleet vessel and to be discussed at ad-hoc on-board meetings with the navigating officers. During this discussion particular emphasis to be given to the Lessons Learned section.
  - (b) Included in the agenda of the shore training "Sharing experience from incidents";
2. The Company's Risk Assessment on "mooring operations" to be reviewed and updated taking into account the lessons learned out of these incidents.

### Team engagement/discussion topics

- What type of incident could occur during vessel's berthing?
- How can incidents be avoided during vessel's berthing?
- Have you ever experienced a similar incident and what were the causes?
- Which behaviours can we pay particular attention to so that we can avoid an incident?

**Figure C2.1:** First example of lessons learned from a review of incident trends





**Figure C2.2:** Second example of lessons learned from a review of incident trends

## Hazards and Ignition Sources



Machinery Space Fires – October 2015

Health, Safety, Security and Environment

## Hazards and Ignition Sources



### Identifying machinery spaces relative on your vessel:

- Engine room, cargo pump room, compressor room, laundry room, battery room, emergency generator room, bow thruster room, steering gear room, workshop areas

### Always pay special attention to the following:

- Ignition sources: hot surfaces, sparks, open flames, electric arc, friction, radio waves
- Leaving coats/shoes/brooms/loose items/oily rags in areas of excessive heat
- Not cleaning filters leading to build up of heat in the system
- Oil leaks

**The leading cause of all fire outbreaks on board vessels is leakages of oil onto hot surfaces**

**Key message: Know the hazards/ignition sources and look out for them**

### Discussion points:

1. What are the machinery spaces on our vessel?
2. What hazard/ignition sources do you come across in the machinery spaces you enter?
3. Lets share some experiences where you or someone you know has been involved in an incident involving machinery space fires



Machinery Space Fires – October 2015

Health, Safety, Security and Environment

**Figure C2.3:** Third example of lessons learned from a review of incident trends



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