

The safety of seafarers going to sea engineering essay



**ASSIGN
BUSTER**

This report aims to educate readers about the safety of seafarers going to sea and the possible dangers that they face. The report will also elaborate about the ongoing issues and measures taken to ensure the safety of the seafarers.

Marine Industry has been a major platform for investment and income since the ancient times. Seafarers face possible dangers from collision of ships, fire and weather conditions. Therefore, the casualties onboard a ship have been increasing due to lack of awareness towards safety on board the ship. The International Maritime Organisation(IMO) took steps to prevent such disasters from happening. Rules have been set up to make sure the equipments onboard the ship are up to date, certified and are regularly inspected. Workers onboard must be well trained in the safety aspects. According to the International Maritime Organisation(2009), ship safety is a subject that is currently receiving high attention by most countries. The International Maritime Organisation(2009) said that this was due to a number of serious vessel casualties that have occurred in recent years.

1. 3 Methodology

The information for this report was obtained from the International Convention for the Safety of Life at Sea (SOLAS) 1974 edition, reference books, research about shipping companies and the internet. Case studies were taken from online news articles.

1. 4 Scope

As there are many possibilities that could happen onboard a ship, this report will investigate solely about the possible cause of fire at sea, preventive

measures, consequences of fire, actual events that took place due to fire, types of fire and much more.

2. Fire Hazards onboard the Ship

2. 1 Causes of Fire

According to John G. Antherson (2000), the causes of fire on a ship aren't a lot different than the causes of fires in any urban setting. As there are electrical circuits onboard the ship, there is a chance for an electrical fire to occur. Machinery onboard a ship can get hot when it's operating. An overheating bearing could cause a fire.(John G. Antherson 2000) Ships use combustion systems to generate steam, and internal combustion engines are used to generate electricity. These combustion systems will get very hot and can cause a fire.(John G. Antherson 2000) Closed machinery spaces and the volatility of fuel, lubricants and hydraulic fluids around the hot machinery can lead to a fire or an explosion. A collision at sea could initiate a fire. The galley where food is prepared is another fire hazard on board a ship.(John G. Antherson 2000) During ship repairs, metal cutting and welding equipment is carried and used on faulty equipment. Sparks from this equipment could also start a fire. There are some more possible ways fires could be started. Fire hazards in the cabin could also cause fire to occur. An article (Anon: Fires In Ships 2002) states that careless smoking is the main cause of fires in ships.

In one case scenario, sixteen Chinese nationals have been taken to the hospital after a fire broke out in their ship(APL Columbia) at port Botany on 5 January 2010. A crew member onboard the 45, 000 tonne APL Columbia(IMO:

9252242) noticed a fire in his cabin about 1. 30am. The man tried to put out the fire but was unsuccessful. The crew members had suffered from smoke inhalation and the fire was put out about 5. 30 am using the ship's own firefighting equipment. In another case scenario, a fire broke out in the engine room. A Maersk container ship (Maersk Duffield) crossed Brisbane's Moreton Bay with its engine room on fire and the Emergency Management Queensland helicopter is en route to assist. One crew member required treatment.

Shipping Database, 2009-2010[Online] Available from: <http://www.shippingdatabase.com/> [Accessed 31 January 2010]

Figure 1 [International Maritime Statistics Forum 2007 p. g 15]

Figure 2

[International Maritime Statistics Forum 2007 p. g 16]

According to the chart (figure 1) made by the Maritime Institute in Gdansk(2007), most fire accidents occur during ship repairs. Fire caused from ship repairs take up 79. 3% of most fire accidents in their case study. Meanwhile, figure 2 showed that 24. 11% of fire occurring on board a ship is located at the Cargo holds and tanks.

2. 2 Classes of Fire

There are 4 types of fire that might occur onboard a ship. There are Class A , Class B , Class C and Class D fires. The U. S Department of Agriculture, Forest Service(2007) said that " Ordinary combustible" fires are the most common type of fire, and are designated under Class A fire . These occur

<https://assignbuster.com/the-safety-of-seafarers-going-to-sea-engineering-essay/>

when a solid, organic material such as wood, cloth, rubber, or plastic become heated to their flash point and ignite. This class of fire is fairly simple to combat and contain . According to National Fire Protection Association (NFPA 2008), the most common way to do this is by spraying the burning material with water, oxygen can also be removed by smothering the fire with foam from a fire extinguisher.

Meanwhile, flammable liquid are categorized under Class B fire. The National Fire Protection Association(2008) reports that this fire follow the same basic fire tetrahedron (heat, fuel, oxygen, chemical reaction) as ordinary combustible fires, except that the fuel in question is a flammable liquid such as gasoline, or gas such as natural gas.

An efficient way to extinguish a liquid or gas fueled fire is to disrupt the chemical chain reaction of the fire, which is done by dry chemical and Halon extinguishing agents. According to an extract from Industrial Hygiene and Information Management (2008): ES&H Manual Chapter 40, Hazardous Materials, class D fire are fires that are caused by flammable or combustible metals. Examples given by the ES&H manual Chapter 40, Hazardous Materials, of such metals are titanium , sodium , magnesium, potassium, uranium and calcium.

Generally, metal fire risks occur when sawdust, machine shavings and other metal are present. These fires can be ignited by the same types of ignition sources that would start other common fires.

Wikipedia, Fire Classes [Online] Available from: http://en.wikipedia.org/wiki/Fire_classes

<https://assignbuster.com/the-safety-of-seafarers-going-to-sea-engineering-essay/>

<https://assignbuster.com/the-safety-of-seafarers-going-to-sea-engineering-essay/>

[Accessed 1 February 2010]

A crew onboard a fishing vessel said that “ If a fire was to start onboard a ship, crew members onboard must know what type of fire it is. If a wrong extinguisher or method is being used, the fire might spread even more.”

(Florida Sport Fishing Crew 2002)

3. Consequences of fire

3.1 Loss of Revenue and Marine Environment

The International Maritime Organisation (2009) said that most accidents onboard a ship will result in a loss of revenue. Cargos onboard a ship might be damaged and millions of dollars worth of cargoes and resources will be affected. Fire onboard a tanker ship will have a high chance of causing an explosion and fuel leaked into the sea will cause water pollution and that will affect the marine environment. Thousands of dollars will be used to clean up the oil spill. A case study given by the Port State Information exchange (2006) was that of Hyundai Fortune where an accidental fire broke out on 21st March 2006. The combined cost of the ship and damaged cargo is estimated at over 300 million US dollars.

According to an online article by Brisbane Times, oil spill clean-up can be rather costly. In a case study by the article, an insurer of a Hong Kong-based cargo ship had to foot the bill for a 20 tonnes of diesel fuel into waters off Stradbroke Island. Authorities announced that the estimated cost of the clean-up will reach about \$100, 000 a day and take seven days to complete.

Daniel Hurst 2009 , Oil spill clean-up to cost \$100, 000 a day[Online]
Brisbane times Available from: <http://www.brisbanetimes.com.au/news/queensland/oil-spill-cleanup-to-cost-100000-a-day/2009/03/12/1236447368184.html> [Accessed on 7th February 2010]

3. 2 Political Fallout

Political fallout might also occur if swift action is not taken. Political fallout will cause the reputation of the government or authority to be at stake.(M. Masellis and S. W. A. Gunn 1992) The disasters that occur within the Maritime Industries can be used as an example for opposition parties to blame the government and this might change the mindset of the society towards the government.

According to an online article by BBC news, an oil well in the Timor Sea off the north-west coast of Australia caught fire. The oil rig had been leaking oil and marine fire fighters were struggling for ten weeks to stop the leak. The National Offshore Petroleum Safety Authority had been called out to help combat the fire and other teams such as the Geoscience Australia and the Australian Maritime Safety Authority were on standby. However, an opposition spokesman accused the Environment Minister of Australia of doing nothing to stop the oil leak.

BBC News 2009 , Australia well catches fire [Online] Available from:
<http://news.bbc.co.uk/2/hi/asia-pacific/8336564.stm>

3. 3 Human Casualties

Accidents onboard a ship will also cause human casualties to occur. Fire especially will be life threatening onboard a passenger ship and it will cause chaos and panic among passengers. (L. M. Collins 1999) A good way to ensure that human life is not lost is for the crew and passengers to follow instructions given by the Captain. If the passengers follow the instructions swiftly, they will be able to escape from the ship safely.(L. M. Collins 1999)

One of the major events that had many human casualties was that of RMS Titanic. According to David G , Titanic was struck by an iceberg and sank in two hours and forty minutes on 15 April 1912. The sinking of the Titanic resulted in 1517 deaths out of the 2223 people on board. The high casualty rate was due to the fact that the ship was not carrying enough lifeboats for everyone onboard.

Brown, David G. (2000). The Last Log of the Titanic. McGraw-Hill Professional. ISBN 0071364471.

Most fire cases are quickly dealt with and the only losses that the crew face are the cargos or raw materials onboard. Up to this day, passenger ship have not faced any fire incidents that resulted in major human casualties.

4. Fire Safety Measures

4.1 Safety of Life at Sea(SOLAS)

M. Masellis and S. W. A. Gunn(1992) said that fire casualties on ships lead almost certainly to disastrous results because of the limited and isolated areas of the vessels and the lack of immediate and easy access for the rescue team. Preventive measures are therefore much more effective in the effort to avoid such casualties than rescue and fire-extinguishing procedures or devices. [Marine fire casualties in merchant ships: the Greek statistics 1992 Available from: <http://www.springerlink.com/content/h8362077847j9127/>]

In 1914, The International Maritime Organisation had a convention among international leaders and maritime leaders to talk about maritime safety. Of all the international conventions dealing with maritime safety, the most important is the International Convention for the Safety of Life at Sea(SOLAS). There have been many versions of SOLAS adopted by the International Maritime Organisation but the present version was adopted in 1974 and entered into force in 1980. The SOLAS conventions have all covered many aspects of safety at sea. The convention in 1914 included chapters on safety of navigation, construction, fire protection and life-saving appliances. (International Maritime Organisation 2009)

This shows that the International Maritime Organisation is constantly trying to find ways to improve the aspects of safety at sea to ensure the safety of seafarers' life by introducing the Safety Of Life at Sea(SOLAS) and updating it.

4. 2 Fire Safety Test and Safety Equipment

One of the fire safety measures is to conduct fire safety test for the ship. Fire safety of ships is an extremely important area. Before any material can be used onboard a ship, it must have successfully passed strict tests and have been certified for use. This is to ensure that the material or equipment does not pose a fire hazard onboard the ship. (SP Technical Research Institute of Sweden 2008)

Another safety measure is to install safety equipments on the ship. Equipments such as fire extinguisher, sprinkler system , gas monitor and other safety equipments are being implemented. The International Maritime Organisation(IMO) is taking steps to introduce new and more sophisticated equipments onboard the ships. IMO hope to reduce the amount of accidents from occurring onboard the ship and will rely on this new equipments to combat the problem more efficiently.

4. 3 Service of ships and Equipments

According to The Safety of Life At Sea 1974 edition, the ship and its safety equipments have to undergo service once every few years. Safety equipments include components that can deteriorate over time. Therefore, this can decrease the effectiveness of the equipment. Examples of such equipments stated in the Safety Of Life At Sea 1974 edition (SOLAS) are fire extinguishers, EPIRBs, flares, life jackets, life rafts and smoke signals. Servicing of the equipment must be done by the manufacturer or an authorised agent by the expiry date. The expiry date must be clearly marked on the equipment. Most life raft needs to be serviced every two or three years. Equipment that cannot be serviced or no longer works must be replaced if it is to be carried as part of the safety equipment onboard the ship.(The International Maritime Organisation 2009)

In the event that an emergency were to occur and the safety equipments were to be faulty as they were not sent for servicing, the manufacturer should not be blamed as the expiry date have been stated clearly on the equipment. It is the duty of the crew onboard and its owner to send the equipments for servicing once the expiry date is over.

According to the IMO 2009, maintenance and inspections of equipments must be recorded to provide objective evidence that these work have been carried out according to the manufacturer's instructions.

4. 4 Proper training for the crew

According to the Maritime Port Authority Singapore(MPA) 2010, Seafarers working on board a ship must have the valid certification or endorsements.

In Singapore, these are issued by the Training Standards Department of MPA.

Seafarers working on board a ship are required to have a valid Certificate of <https://assignbuster.com/the-safety-of-seafarers-going-to-sea-engineering-essay/>

Competency (CoC) or endorsement, which comply with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

The crew must also be well trained in fire fighting and First Aid. Those who wish to work onboard a ship must have an Advance Fire Fighting Course certificate and Elementary First Aid certificate as well before they are qualified to work onboard (Maritime Port Authority Singapore 2010). The crew will also conduct regular safety drills after each departure from port. The crew are to follow their duty that had been assigned on the Muster List.

By having proper trained crews onboard a ship, this will minimise the chance of human error and accidents from occurring. Furthermore, the crew are well trained to handle any emergencies such as fire. The International Maritime Organisation (IMO) 2009 once said that the quality and familiarisation are directly affected by the frequency and quality of the drills carried out. IMO added that a crew debrief after each drill is essential to emphasise lessons learned and to give additional training where necessary.

5. Conclusion

5.1 Further Improvements

Every year, the International Maritime Organisation and other Maritime Body are working hand in hand to improve a seafarers life in terms of their living condition and to ensure that they are working in a safe environment. The organisation are trying to find constant improvement to reduce marine casualties, loss in revenue due to unwanted accidents. One improvement that can be introduced to the ship is the All-in-One fire extinguisher. This

<https://assignbuster.com/the-safety-of-seafarers-going-to-sea-engineering-essay/>

extinguisher would be able to combat any types of fire such as Class A , Class B, Class C or Class D fires. By having this fire extinguisher onboard the ship, the crew will not need to waste time to find different methods to combat different types of fire. Another improvement that could be introduced is the fire isolating system. This system will isolate the fire from spreading to other rooms and this will reduce the damage caused towards the ship. The Maritime Port Authority said that this new inventions will further improve the safety aspects but it still needs to undergo more tests before it can be implemented towards the ships.

5. 2 Human Error is still the Main Cause

The International Maritime Organisation have taken steps to ensure that the technology and safety equipments being implemented are up to date. Even though this is so, nothing can be done if the accident caused is by human error. Even if the crew had gone for proper training, human error will still occur. An article by B. S Dhillon(2007), human error costs the Maritime Industry \$541 million per year and a study of 6091 major accident claims revealed that 62% of the claims were attributed to human error. B. S Dhillon(2007) added that human error contributes to 84% to 88% of tanker accidents.

[B. S Dhillon 2007. Human Reliability and Error in Transportation Systems, Springer Series in Reliability Engineering . Page 1.]

These incidents will result in crew injuries or death and the ship will be delayed or damaged. Even if there is mechanical failure, human error can play a role in terms of lack of maintenance , monitoring or a breakdown in

<https://assignbuster.com/the-safety-of-seafarers-going-to-sea-engineering-essay/>

communication. The Bahamas Maritime Authority added that crew fatigue and complacency can be a major factor in this incident. The Bahamas Maritime Authority said that " Good equipment can cost more, but safety should be accorded a higher priority because a ship cannot be operated safely without the seafarer."