



Safety Education Video for Contractors and Subcontractors Working Onboard Ships

Safety Education Video script

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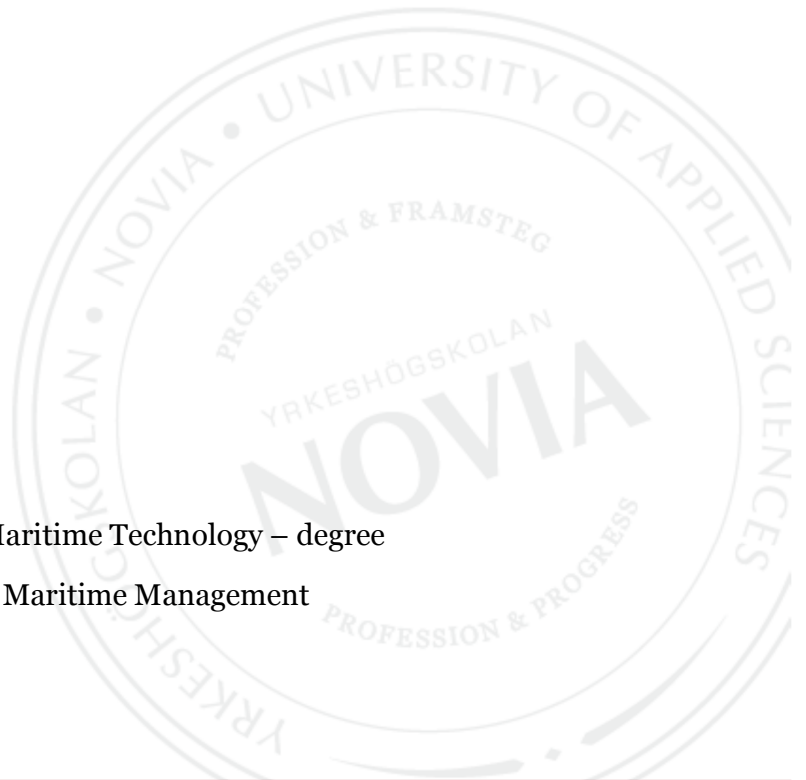


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Summary:

The goal of this thesis is to create a script for making a safety education video for contractors working onboard ships.

This script would give introductory education to contractors about the safety guidelines to be expected and observed onboard a ship. We aim to be able to help the contractors to be aware and to be able to take care of their own personal safety.

We also aim to communicate and emphasize the safety procedures for escaping from the engine room in a simple and efficient manner to the contractors.

Apart from individual contractors this thesis would be useful for firms that do contract work on ships and for shipping companies to use as a general framework for creating a customised safety video suited to their own company. This video can also be useful as an aid for safety officers onboard when briefing contractors about ship specific safety familiarisation.

Thus we hope that with this thesis work we will be able to deliver a short, interesting and efficient safety video script that will enable contractors to be able to contribute positively to the safety culture of the ship.

Language: English

Key words: Safety, Education, Contractors

The examination work is available at the electronic library Theseus.fi

1 Introduction

Ships occasionally need maintenance or upgrades for its equipment onboard, in this situation an external independent contractor is employed to fulfil this requirement. This was particularly evident during the implementation of new sulphur emission rules in the Sulphur Emission Control Area, when some shipping company decided to install a new scrubber system onboard their ships to remove the Sulphur oxide and Nitrous oxide from their exhaust gas. (Wärtsilä Cooperation, 2016)

This meant that contractors had to be onboard for an extended period of time to install the equipment and monitor the performance of the newly installed equipment, sometimes when the ship is performing its normal operation while at sea or in ports. This brings about a safety concern because these external contractors are not as familiar with the safety operation of the ship when compared with the regular ship crew members.

There is also the situation where contractors have to do very short term maintenance/repair work on the ship while it is at port, this may be due to the fact that it would cost more money and time per hour worked if the contractors were to sail with the ship for a job that can be narrowly squeezed in between the relatively little time ships spend at port. These jobs could involve working in unfamiliar environments like enclosed spaces, engine rooms, doing hot work while the ship continues its normal operation. The reality of this situation is that in practice there may not be enough time for the safety officer onboard to go talk about safety procedure onboard the ship, because port operations are also very busy times for crew members onboard the ship. (Skuld Guide, 2016)

One example that illustrates the importance of this is the engine room accident that involved the death of contractors in an engine room fire of the Insignia cruise ship in which the United States Coast Guard investigating the accident issued a safety alert stating that

“Machinery spaces onboard cruise ships and other large vessels are complex spaces where an unfamiliar person can become quite disoriented, particularly during emergencies”. (United States Coast Guard, 2015)

This statement acknowledged the dangers to contractors who are referred to as unfamiliar persons by the United States Coast Guard thus highlighting the importance of a Safety Education video specifically designed to improve the safety of contractors onboard the vessel.

1.1 Objective

The main objective to provide the generic content script for safety educational video for non-seafaring workers on board vessel. It is safe to conclude that both the ship crew and the contractors are interested in working safely and finishing the day's task without any mishap. The goal is to also stimulate a proactive attitude to safety by the contractors. This mean that the contractor would be active in asking the crew members about the safety procedures onboard the ship automatically.

The hope is that the video that is eventually produced from the script would be easy to understand and would be clear and effective.

1.2 Research question

What should be the content appropriate source for the script and how should a safety video script for contractors be written?

1.3 Limitations

This work is limited by the fact that as Maritime student and not psychologist, there are limitation with our knowledge of psychology. Psychology is defined by Merriam Webster dictionary as the study of the mental or behavioural characteristics of an individual or group. (Merriam Webster, 2016). This is because the effectiveness of the video script has a lot to do with the study of how human's learn or human training techniques.

This video script was also done based on the General Basic Safety knowledge useful contractors, so it is doesn't necessary include extensive details. It should be clearly understood that this video cannot not replace Ship specific safety familiarisation that should be done as stipulated by the STCW law. This is because the instructions in this video script are general and because each ship may have different unique safety features.

2 Theoretical Background

Safety issues in the maritime industry is well-known (Hansen;Nielsen;& Frydenberg, 2002). It fatality results in several loss of lives daily, a total of 31 140 occupational accidents at sea on Danish merchant ships were reported between the year 1993 to 1997 with 209 of them rendering the victims permanently disable and 27 loss of lives. Although there seems to be much concerned international however there is few literature to cover the non-dangerous cargo carrying ships (*ibid*).

Human errors are the major factors of accidents onboard; 75-96% of all casualties' onboard ship results from ergonomically inefficiencies (Rothblum, 2000). In other words proper safety training and human alertness could prevent an average of 80% of all marine incidents. There is therefore the need to increase the safety training and that led to the formation of the STCW.

2.1 STCW

STCW is the International Convention on Standards of Training, Certification and Watch keeping for Seafarers, 1978 was adopted on 7 July 1978 and entered into force on 28 April 1984. The main purpose of the Convention is to promote safety of life and property at sea and the protection of the marine environment by establishing in common agreement international standards for training, certification and watch keeping for seafarers. (IMO - STCW, 2011)

It's also unifies all the maritime standards in the world with regards to safety, thus all the maritime professional working on any ship anywhere in the globe have the same common core and standardized education. (Morrison, 1997)

2.2 Ship Familiarization

Chapter VI, Regulation VI/1 in Paragraph 1 of the STCW convention seem to imply that Seafarers shall receive safety familiarization and basic training or instruction in accordance with section A-VI/1 of the STCW Code and shall meet the appropriate standard of competence. (IMO - STCW, 2011)

The Section A-VI/1 paragraph 1, part A however states that before being assigned to ship duties, all person employed or engaged on a seagoing ship, other than passengers, shall receive approved familiarization training in personal survival techniques or receive sufficient information and instructions. (IMO - STCW, 2011)

In this part of STCW there is potential for confusion among seafaring worker, because it can easily be interpreted that this provision applies only to those only employed on the ship fulltime, i.e. the ship crew. It is usually a culture for normal seafarers to go onboard and expect ship specific safety familiarization but for contractor working onboard the ship this is not the case.

When the interpretation of this law is fully analyzed, it can be seen that the safety familiarization training should always be done for contractors as well, regardless of how long they might be onboard, even thou in practice this may not be possible for contractors that are there for only few hours. W.S.G Morrison further explains in his book that explains STCW convention

“Those required receiving approved familiarization training in personal survival techniques or sufficient information and instruction as itemized in paragraph 6, include all persons engaged or employed by an entity, organization or individual contracted to provide any service of any nature on board during a seagoing voyage. This includes maintenance and repair personnel, shop assistants, hairdressers, beauticians, entertainers, etc. The intention is that all on board, other than passengers, are made sufficiently familiar with the ship to look after themselves and also act in a positive manner in the event of an emergency so that those trained to deal with shipboard emergencies can better concentrate their efforts in controlling or eliminating the cause if the emergency” (Morrison, 1997)

This is why the Safety video script was done with the emphasis on the message that the contractor should be proactive and consult the safety officer about safety on the ship. This ensures that even if the safety responsible officer on the ship is not carrying out their responsibility according to the law about ship specific familiarizations, the contractor by being proactive can get the ship safety officer to do the right thing and give instructions about safety procedure onboard the ship.

2.3 Contractors

Contractors are external independent workers that are not part of the ship crew often used onboard vessels to conduct work including, but not limited to: structural and mechanical repairs, vessel manoeuvring assistance, diving inspections etc.

Contractors usually have some background general occupational safety training but may lack ship specific training, for example an electronic engineer coming onboard to fix the ship electronic system would only need to have done basic occupational safety course. Thus this safety educational video should add another layer of training to the contractors

2.4 Engine Room/Machinery Space safety

With this educational video script it is recognised that there is a lot of contractor work in engine rooms and machinery spaces and there is a fact that those places are prone to fire hazards. According to the conclusions of a thesis report in the Journal of KONES Powertrain and Transport titled “Analysis of fire hazard and safety requirements of a Sea vessel engine room”, it states that engine room fire hazards constitute between 30%-50% of the overall vessel fire hazard, where about 60% of fires break out in fuel oil and diesel oil system. (Charchalis & Czyz, 2011)

Due to the frequency of fire in the engine and the complex spartial structure of the machinery space, complicated pathways and the inability to predict the location of potential source of fire, it could be difficult for even normal ship crew with extensive training to be able to safely evacuate from the engine room. (Getka, 2011)

It has also been noted that the knowledge of emergency escape breathing device (EEBD) is not popular among seafarers, this device are used for emergency evacuation in smoke filled spaces and they must be in all engine room by law. It has also been noted that some deaths in engine room fire could have been prevented if the personnel involved had used the Emergency escape breathing device (EEBD). (Getka, 2011, 22)

Therefore the video script include instructions for using the EEBD.

Fires in the machinery spaces are much more explosive when compared to other spaces on the ship, this is due to the fact that most fires on the engine room occur due to the leakage of fuel, usually under high pressure from the main engine. Therefore, the ability to evacuate very fast and effectively from the engine room is very crucial to the survival of the contractor. (Getka, 2011,23)

This is why the safety video script include a section dedicated to safety procedures to be carried out in the engine room and focus on evacuation from the engine room space.

2.5 Psychology of adult learning

It has been recognised that this safety video would be targeted at adult so naturally the script writing process requires some knowledge about principle of adult learning

According to Elaine Biech, Malcolm Knowles has written in his book “Adult Learner: A Neglected Species” Published in 1973. The book contains instruction about how adults learn

- Adults have a need to know why they should learn something before investing time in a learning event
- Adults have a strong readiness to learn those things that help them cope with daily life effectively
- Adults are more responsive to internal motivators such as increased self-esteem than external motivators such as higher salaries

What must trainers do to help adult learn effectively

- Trainers must ensure that the learners know the purpose for training as early as possible
- Trainers must ensure that training relates directly to situations adult face
- Trainers must ensure that internal motivations are not blocked by barriers such as a poor self-concept or time constraints by creating a safe learning environment

In the design for this video script have aimed to provide a good training by applying the points highlighted in this paragraph. (Biech, 2005 , 26-27)

2.6 Life cycle analysis of the Safety education video

The most popular method for developing new training programs is called Instructional Systems Design (ISD). Which was developed by the USA military for their training needs. This method has been chosen for the development of the Safety training video. (Biech, 2005, 40-41)

2.6.1 Accessing and analysing needs

This was achieved this by consulting the Wärtsilä about their needs and had face to face discussions with the manager responsible for training development and operations about their needs.

It was through this process that it was learnt that Wärtsilä wants emphasis to be placed on safety in machinery space.

2.6.2 Developing Learning objectives

At this stage the main question is what achievement will result from this video, so at the end, after the contractor have watched the video.

- The aim is that the contractor would have learned to be proactive onboard about their own personal safety
- The Contractor would be familiar with the unique safety procedures onboard ship

2.6.3 Design and Develop the program

This is the stage where the script is written and the video is shot. The script is produced from various maritime safety literature and IMO laws. The methods and procedures that have been chosen to design and develop the educational safety video will be further discuss in chapter 3 of this thesis.

2.6.4 Implementing the design

This is the stage where the video would be shown to the contractors. It could be shown as part of a series of safety video or it could be a simple video available on the public internet.

2.6.5 Evaluate performance

This stage shows whether the original objectives were met, if they were met then the safety video can be used by the companies to train their contractors. One way to measure if the original objective was met is through a safety exam, which could also be implemented in the video. This would test the contractors about their knowledge before watching the video and their knowledge after watching the video. A longer term way of testing is also if there is a reduction in contractor accidents/incidents onboard the ship due to watching the safety video.

If not then it needs to be accessed again and the whole process goes again into a cycle described in Figure 1.

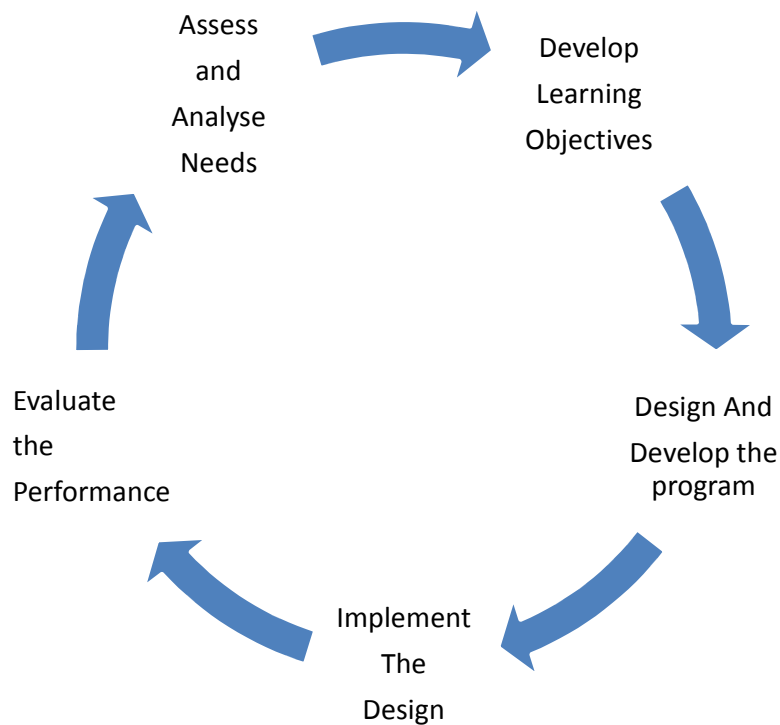


Figure 1 the whole process of training (Biech, 2005, 41)

2.7 SMART

SMART process explains why the choice of a video is the most cost effective way to improve the safety of contractor onboard ships without making any systematic/structural change that could be expensive

- **Specific:** Safety video can be very specific about its goal and objectives and achieve a lot for very little cost.
- **Measurable:** The success or failure of a safety video is very measurable, when compared to a systematic measure
- **Attainable:** It is relatively easy to make a safety video, so it is an achievable goal.
- **Relevant:** A safety video is immediately useful to the contractors who would appreciate the information and knowledge they gain from the video. A systematic change in work procedure may not appear relevant to the contractors and thus it is more difficult to implement
- **Time-bound:** Every minute that nothing is done another contractor's life is at risk. A safety video can be done in short time and thus start saving life immediately. Systematic/Structural change in the working system usually takes a longer time to implement.

3 Previous work and Research

Previous work and researches were studied during the making of the script for the safety video. Due to the fact that cruise ships transport people and tend to be more safety focused about personnel/ passengers than other ship types, cruise ship safety videos were extensively studied during the making of this video script. The safety video for princess cruises titled safety at sea was consulted, this safety video which is available publicly online on YouTube was targeted for their crew members. (Cruise, 2014)

A safety video for contractors made my Canada Steamship line was also consulted. This proved helpful to give a good guidance for the Safety script writing. It should be noted that the nature of the video made by Canada Steamship Line is that their video is well customised and suited to their operations and thus cannot be easily applicable generally for all contractors (SAFETY VIDEO FOR CONTRACTORS, 2015)

The main difference between this previous video work and the safety video that will be made from this script that this video script is more general and targeted to all contractors on all ship type. This is important because contractors actually work on different ship types and not just one particular ship or shipping company. Another difference is that this safety video script create focus on specific safety features like the use of EEBD and escape from Engine/Machinery rooms which have been proved to be crucial in Sub chapter 2.5

4 Methods and Procedures

In this Chapter the aim is to show the method that has been taken to produce the video script. The STCW was used as the backbone for the script, this is because the minimum standards have being specified in STCW

4.1 Using STCW Familiarization material as the foundation for the Script

The safety goals of the safety familiarization training for all new crew was used as a standard for the design of our safety video script, this means that contractors should be able to communicate with other personnel on board on elementary safety matters and understand safety information symbols, sign and alarm signals.

The safety video showed what to do if there is a man overboard situation, it showed fire or smoke if it is detected, the safety video script also showed what to do if fire or abandon ship alarm is sounded. The safety video script laid emphasis on the importance of the muster stations and on the emergency escape routes. The video scripts showed how to locate life jackets and raise alarm in case of fire. It also showed

the dangers of watertight doors and the caution associated with using water tight door. (IMO - STCW, 2011, 217)

While using the Safety familiarization guidance as the frame work for the safety video script, there is some additional knowledge to the safety video script for example, escaping from the machinery and engine room, the use of EEBD. The safety video script does not include instructions on how to fight fire because of legal reasons and because the ship crew are especially trained to fight fire and have it as their duty on the muster list to fight fire onboard, instead the safety video script focused on how the contractors should save their own life and escape from dangerous fire situations while raising alarm to attract the crew for fire fighting operation, so the emphasis for safety video for contractors is prevention on fire, raising alarm during fire and escape.

4.2 Script writing

The script for the safety video was composed of twenty scenes that span through all necessary areas that a contractor worker will encounter on board. Each of these scenes consist of three parts namely action, audio and text on the screen, which is the fundamental technique in writing a film script thus breaking down the in-mind idea of the storyline or the movie picture into fragments and units that can be easily be dealt with accordingly (Swain & Swain, 2015).

Adequate planning is essential step to a successful scriptwriting. For educational film script, any needed information on the subject must be gathered and the writer must essentially have foreknowledge and ultimately have practical experience to be able to relay the information perfectly (Gonzalez, Previte, & Tombs, 2011).

It also important to establish how and what the information that will be scripted be metamorphose into the film production. It will be off no use if the information that has been scripted cannot be reproduced graphically (Rea & Irving, 2015). Therefore the scriptwriting was confined within the video production capabilities of the contracting company as much as possible. Mind map and drawings were used to illustrate each scene as much as possible to determine which information is actable or could be presented graphically. The best alternative which can be reproduced graphically information was opted in a situation where the original intend idea is impractical.

4.2.1 Methodology

As it already mentioned the script had three parts: the video graphics, the audio and the text on the screens. Educational film production is has different set audience and especially for such kind company safety video training is audience-specific and has totally different presentation way from any other film (Gilder, 1989). For instance

the text part of the script might not be profitable in general movie. All illustrations and demonstrations in such a safety educational oriented film will not be seen in entertainment video; therefore the main purpose for the video should be fundamentally established (Gonzalez, Previte, & Tombs, 2011).

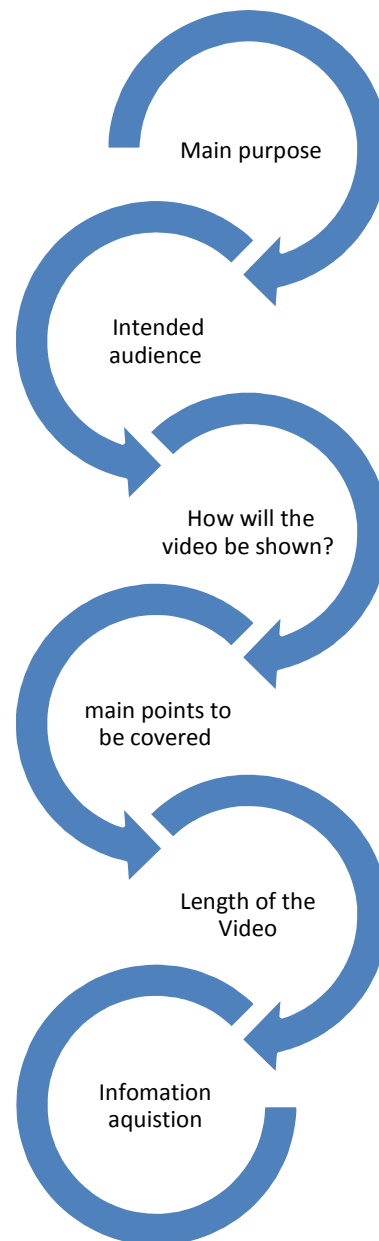
The steps illustrated below were taken in the planning process before the script writing. The necessary considerations were taken in each of every steps in the planning part of the script writing.

After a meeting with the contractors, most of the information needed for the planning was established. The main purpose for the video was made known to be educate the intended audience contract workers on safety issues onboard, what they need to know, what they have to do and what they should not do. It was also established the platform to which the film will be shown which was internally within the contractors staffs training platforms and the length of the tape was estimated to be between 10 to 15 minutes. So the primary task that was done in the script planning was the determination and gathering of the important or necessary information.

It is also essential to determine how the video starts. The script of the video produced begins by a trailer of an incident and continues to introduce the reason or the purpose of the video. The information at the first scene of the video is regarded to be one of the most important parts of the whole video, because it holds the key to achieving the purpose of the video as it is the determinant for the audience to continue and watch the whole video if their appetite is wet enough for more or discontinue if they found no pleasure for more. For education video, such information, can be a short introduction of what the whole film is about or it can be a trailing example of the issue the film seeks to educate the audience on. The first impression is very important (Mollison, 2010).

It is also important to determine how the film develops one scene after another, the information relay should be continuous and in harmony with the middle portion delivering the main point of the message. Some of the information can be put on the screen as text and others can be repeated as audio (Gonzalez, Previte, & Tombs, 2011), however considering the demand made by the company that they intend to subtitle the film into seventy languages the screen text was left blank to make room for subtitling.

Figure 2: Planning Steps for the Script (Gonzalez, Previte, & Tombs, 2011)



4.2.2 Information determination, acquisition and gathering

To achieve the intended purpose of the production of the film, content determination is of a core importance to the planning and the writing of the script. Videos designed to fulfil cognitive and behavioural objectives must be more specific and accurate on the contents (Gonzalez, Previte, & Tombs, 2011). Safety training in the maritime industry is generally governed by precepts that are adequately underlined in the

IMO's STCW and the ISM Code (Rodriguez & Hubbard, 1998) and therefore these regulations were used. The ISM Code creation by the IMO was intended to provide uniform international organisational structure for ship-owners and management to train crew in regards to safety. Since its formation the record of incidence usually caused by human error has drastically reduced (Lappalainen, 2008). Similarly the STCW impact on safety since its introduction in the maritime industry is very conspicuous and enormous.

Thorough search through these regulations were made and the information gathered were summarized to make it concise and best fit for 5-10 minutes audio reading. The core information relevant to our focus was chosen. The chronological steps of information flow in the script were based on personal imaginations of realistic scenes and experiences of the authors of this work.

5 The Script Content Discussion and Analysis

5.1 Introduction

The very purpose of any introduction to every education film is to conscientize the audience the content and the purpose of the film. The introduction must be able to catch the attention of the audience as well (Mollison, 2010). The script begun with a person caught up in thick dark smoke with fire alarm sounding continually, causing a chaotic and confusion real time scenario of an incidence of fire explosion on board. Such scenario was chosen to create awareness of the rampant occurrence of such incidence so that the contract workers will pay much attention to the content of the video, knowing very well it could happen to him or her.

Then the audience would be told that the video is purposed to show them the solution or the way out if it happened they find themselves in such a situation in anytime of their career on board vessels and also gives other important information such as risk availability and first aid medical receptions.

Using trailers at the beginning of the quite common in are safety videos and documentary movies. Trailers have special impact on the audience psychologically and influence their movies choices and selections (von Wenzlawowicz & Herzog, 2012).

5.2 BEFORE YOU ENTER THE SHIP

This scene as part of the script was intended for adequate preparation by any contract worker before getting on board. It is expected that anybody be fit mentally, physically and emotionally. Secondly, the person must have gathered all the necessary facts and essential seafaring knowledge on safety and most especially by watching the video that will be produced by this script and understand and know what to do in case of emergency. Such action was taken because every crew on board have to some extent some level competency of safety which are mandated by the law, however failed to explain ubiquitously the definition of inclusion of contractor workers as seafarers.

The Maritime Labour Convention in the earlier versions before 2006 provided definitions for contractor workers as supernumeraries which were non-permanent crew and did not have equal rights as seafarers but treated quite different however has been revised and any person on the ship other than a passenger is considered to be a seafarer. They are therefore supposed to participate in all familiarisation exercises. The convention however made special clause for occasional workers to be trained by their employers (Trask, 2013). Therefore although occasional contractor workers are prone to the same risk like any person on board, they are not strongly mandated by law to be trained. The other issue that practically arise is that they might be considered to knowledgeable and well trained on safety by the crew on board and will result possibly not being attend to in emergency.

5.3 Ship entry

It was essential for demonstration of the standard of readiness to work on board. The proper safety clothing must be worn from the head helmet to the safety boot of the feet. Every part of the body must be protected because of the existence of various dangerous areas such as gangway and safety net, main deck holds and hatches, forecastle and poop deck windlass, anchors and winches , cranes and derricks manifold and pipeline systems (Falck Safety Services, 2014)

There could be also slips, tripping and falls may be result from slippery surfaces, obstructions, open manholes, unfenced tween decks, loose or misplaced gratings , injuries due to ship movement in rough water (Falck Safety Services, 2014) so the person should be ready. Such locations are supposed to be shown on the screen as someone acts as contractor worker on climbing over to the gangways to the ship.

5.4 After entering the ship

This scene was to enforce the contractor the need to ask for the safety officer of the ship immediately after entering the ship. It demonstrated that the crew that opens the door to the contractor worker must be charged to show where the safety officer is. It is expected by the ISM Code for the contractor worker to contact the ship safety officer for the short or brief ship familiarization, safety and emergency plans however research shows that most casualties and incidents are as a result of the law and procedure not being adhered to (Batalden & Sydnes, 2014). So therefore the contract worker should be safety-minded proactive, and insist to see the safety officer before proceeding to any place on the ship.

5.5 Parts of the ship and getting directions

Good communication is the bedrock for safety on board. Most incidence occurrence on board can be traced to miscommunication, poor communication or complete lack of communication (Hetherington, Flin, & Mearns, 2006). It is therefore essential for the contractor worker to understand the basic terminologies in Maritime English language in relation to parts of the ship and giving of directions which will be of good help to communicate effectively during the working time on board. Maritime English Language was introduced to provide set of common wordings to disambiguate the confusion in communication between people of different accent and native tongues (Ziarati, Ziarati, & Çalbaş, 2009). Therefore the fundamental terminologies for acquiring directions such as port means left, starboard means right, fore or forward means front etc. were explained and illustrated.

5.6 Meeting with the safety officer

It is required by every ship to have safety officer which is specially trained, well know ledged, and experienced on crew's health and safety related issues and the ISM Code (Rodriguez & Hubbard, The international safety management (ISM) code: A new level of uniformity, 2005). It is stated in the clause 6.3 that

"The Company should establish procedures to ensure that new personnel and personnel transferred to new assignments related to safety and protection of the environment are given proper familiarization with their duties. Instructions which are essential to be provided prior to sailing should be identified, and documented and given"

So it is mandatory for every ship to familiarize new personnel not necessary crew only. Every work done on the ship is capable of risking the safety of the lives, ship, cargo and the environment therefore the safety officer is there to familiarize the ship to the contractor worker in accordance to the law. The areas of the ship that should be familiarize includes the safety aspects of the ship, location of life saving and

firefighting appliances and how they are operated; and emergency routes and roles. These would discuss in subsequent scenes later.

It should be emphasized that familiarization exercise is different from training. The responsibility of training of contractor workers is solely of the employers. Every company is supposed to train its staffs on health and safety issues in related to the work, risk and dangers likely to be encountered and working in safety conditions and avoiding casualties; such is the purpose for this video of this script. Familiarization might include training however restricted to the place of work. Safety procedures although might contain the highlighted areas by law however differs from ship to ship and company to company base on ship interfaces and company procedures and policies. So it is therefore advised that this safety video does not exempt any contractor worker from familiarization exercises however it rather purposed to enforce it.

5.7 MUSTER STATION

Muster station is the safe refuge area for escaping or evacuation on board ship in event of emergency. Such an area is strategically planned and positioned in shipbuilding process on the ship in a location that is easy to access without constraints or obstacles (Azzi, Pennycott, Mermiris, & Vassalos, 2011). The number of muster stations on a vessel is variably dependent on vessel size and type. For instance a passenger ferry of the same size of a tanker will have more than the tanker.

The path to the muster station can be access from any position of the ship unhindered with reflective signs located both top and down the walls of the entire ship and is visible in event of blackouts. At the muster station is located evacuation equipment and lifesaving appliances. To know the location of the muster station is a fundamental pillar to the knowledge of the safety of the contractor worker and its inclusion to the script was very vital.

5.8 MUSTER LIST

Muster list is required by SOLAS to be displayed at locations that can be seen easily on the ship such as crew's accommodation, bridge and engine room. It is the detailed information of evacuation process on the ship in event of emergency. It includes required behavioural reaction of crew to general alarm and means of communication on board and duties allocated to each crew. The contractor worker therefore need to read and be familiarized with the required procedures, though might not have a specific task on the list, however needs to know the important features of the muster list, who and what is supposed to be done in emergency (Vidan, Dlabáč, & Jerković, 2015).

5.9 ALARM ONBOARD SHIPS

There are various types of alarm on-board ship to signal the crew or the passengers or both on an issue. Some of the alarms are only to notify a handful of the personnel on board, others are for general concern. For instance navigational and machinery space alarms are to notify the crew on the bridge and the engine room respectively only. Others are for the attention of everybody for example general alarm, man overboard alarm, fire alarm, abandon ship and ship security alarm (Wankhede, 2011).

These alarms are mostly of emergency situations unless drills or alarm is being tested. As contractor worker, what should be concerned is the alarms intend to draw everybody attention and the one specific to the department of work. For instance if the contractor worker is onboard to fit engines, the engine room alarms such as CO₂, enclosed spaces, within the engine room should be concerned alongside the general alarms. The script was therefore included various alarms of such, their sounding signals and how to determine the interpretation of each alarm.

5.10 FIRE EMERGENCY

One of the most serious risks on board is fire. With tons of flammable liquids on board fire on ships are more risky than any industry on land. Besides there are also several textures that can easily create and prolong fire on board (Garri, 1992). Most incidences on ships are related to fire and for this reason seafarers go through an extensive firefighting course to gain the needed competence to combat any eruption of fire on board. Contractor workers need to be equipped with enough knowledge before entering the ship. There are different techniques of fighting fire. The source of the fire determines the approach to extinguish it.

The earlier version of the script explained different types of fire extinguishers; contractors were much concerned about safety of their staffs and required the script should concerned more of escaping fire to safety place due to legal and technical issues involve with firefighting.

In event of fire the most cautious effort one has to make is find means of avoiding inhaling the toxic smoke as research has shown it is the most killer on board in such incidences (Minty, et al., 1985). It is therefore prudent to crawl on the floor since smokes are always occupies higher heights of the building. The basic fire safety procedures were included in the script: when a fire or smoke is detected the closest fire alarm button should be pressed, fire doors closed to trap the fire and moves to a safer location. Actions like smoking in unspecified locations must be refrained. Extra caution should be taken when working with fire.

5.11 WORKING IN THE ENGINE ROOM

Working in the engine room demands some basic housekeeping to keep it a safe environment. Due to the voluminous availability of fuels and numerous electrical and static forces, it is the part of the ship that is most prone to fire. Aside from fire there are various obstructions that could lead to tipping and falling. Oil and grease on the floor and stairs could lead to accidents so working as a contractor worker should be avoided. Working in the engine room involves entering enclosed spaces and doing hot work. Such work needs a permit.

It is also compulsory to obtain a permit from the Safety Responsible officer before entering an enclosed space on board the ship. Every ship is expected to have procedures for issuing permits in accordance with paragraph 7 of the ISM Code (West England P and I, 2012). The shipping company must train competent and responsible persons to be in charge of recognition of hazards, evaluation, finding control measures and eliminating those hazards in enclosed spaces in accordance with standards accepted by the administration.

Appropriate training should be conducted for crew members on enclosed space safety, which should include familiarisation with procedures for recognizing, evaluating, and controlling hazards related to entering enclosed spaces on board (West England P and I, 2012). Enclosed spaces need to be properly ventilated with oxygen content more than 20% displayed on the oxygen reading instrument with very little of any flammable gas present and it should not be entered alone. There should be efficient lighting and all checklists necessary for accident prevention done and endorsed.

Hot work is any work that involves naked flame, electric arc or gas welding gear, cutting burner tools or, including heating or spark producing equipment needs a permit before it starts. The permit is granted after the safety officer in-charge has checked the necessary fire risk assessment and safety measures followed.

5.12 MEDICAL EMERGENCY

Seafarers receive medical emergency training with STCW standard at school due to the hazards related to the job as in an isolated environment. This gives an average seafarer the basic first aid competence to tackle any immediate action before any injuries are taken to the hospital (Oldenburg, Rieger, Sevenich, & Harth, 2014). The first aid spans from application of bandages, intravenous access placement, wound suturing and painkiller administration (IMO - STCW, 2011). Medical chest on board contains various drugs for treating scurvy, and tropical diseases, and general patient care (Oldenburg, Rieger, Sevenich, & Harth, 2014).

There is also specially trained officer on board who is competent enough in handling first aid care designated as medical officer. It is very likely that contractor workers unaware of the medical services turn to go home with injury without first aid and later had to be admitted at the hospital as a result of the issue developing to an intensive level. Therefore it was essential to stress on the availability of immediate medical help on board and show the possible location of medical chest in the engine room and on board in general and most especially who to contact in the midst of injury. It was also suggested that when working alone and involved in severe injury that needs immediate attention however the injured person has become immobile, the safest and the fastest action to get attention is to hit any closest fire alarm button available. It will draw attention from the bridge and the person will be attended to.

5.13 MAN OVERBOARD

Working on sea has various risk and hazards due to the ship motion being tossed by heavy weather elements such as winds, waves, currents etc., extra careful must be taken when working closed to walls of the open deck to prevent falling overboard into the sea. Actions like working on higher heights without harnessed ladder, or a bosun chair should be refrained. When working on such areas it is prudent for the safety officer be aware before the operation is carried out

6 Conclusion

The idea for making safety video for contractor would improve the overall safety. It will make them more aware of things to ask from safety officer when they arrive on-board new vessels as it is a positive step for safety, even if it's a small step.

6.1 Future Research

Future research could focus on systems and structures that have allowed the situation that safety familiarization training is not done for contractors coming to work on board. For example, why do so many shipping companies, crews and contractors wrongfully think that the STCW law about Safety Familiarization applies only to ship crew members?

Another interesting research would be the effect of the safety video on contractors; feedback from them would be great to improve the content and quality of the videos.

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8 Appendix Script for safety video for contractor working onboard ship

Scene	Topic	Action(Video)	Audio (Overtone)	Text On Screen
1	INTRODUCTION	<p><i>General alarm going on and blackout with fire, smoke and someone stuck in the Engine room</i></p> <p>Show a well-dressed and Uniform deck officer giving the safety instruction</p>	<p>What will you do?</p> <p>This video is needed because of the unique environment of a ship, Accident rate onboard ship are often among the highest when compared to other occupations as ships have specific challenges, hazards and risks not usually found on land.</p> <p>These Dangers are further complicated by the fact that ships usually operate far from the safety of land</p> <ul style="list-style-type: none"> • At the end of this video, you will be well informed about the unique <ul style="list-style-type: none"> i. dangers and the risk you are likely to encounter on board the ship ii. The unique Safety system available on-board ships iii. Where and how to get Medical first aid onboard 	<p>ARE YOU READY? ARE YOU PREPARED? ANYTHING CAN HAPPEN....</p> <ul style="list-style-type: none"> •Dangers related to work •How to work safely – job responsibility •What is done to protect your health and safety •Where and how to get first aid •What to do in emergency
2	BEFORE YOU ENTER THE SHIP	Someone (Mr. Y) watching this safety video and reading the Muster list instruction onboard	As a non-seafarer on board the ship it is important to be proactive about your own personal safety. So please pay close attention to the instruction in this video	Watch this video completely and pass the assessment test afterwards
3	SHIP ENTRY	Someone (Mr. Y) well dressed in safe working clothing at the	When entering the ship makes sure you have all your Personal protective equipment with you and	

		<p>entrance of the ship. Doors opens, meet a crew member at the gate</p>	<p>your ID as well. POTENTIAL HAZARDS LOCATIONS</p> <ol style="list-style-type: none"> 1. Gangway and safety net 2. Main deck 3. Holds and hatches 4. Forecastle and poopdeck 5. Windlass, anchors and winches 6. Cranes and derricks 7. Manifold and pipeline systems <p>Slips, tripping and falls may be result from</p> <ol style="list-style-type: none"> 1. Slippery surfaces 2. Obstructions 3. Open manholes 4. Unfenced tween decks 5. Loose or missing gratings 6. Injuries due to ship movement in rough water 	
4	WHEN YOU ENTER THE SHIP	<p>Mr. Y begins to ask the crew to take him to the officer in-charge of safety on the ship</p>	<p>Remember to be always proactive about your own personal safety. The way to be proactive about your own safety is to ask the crew that let you into the ship to take you to the officer in-charge of safety of the ship. Pls note that some crew may assume that you are already familiar with the ship and might not automatically show you the safety officer unless you are proactive and</p>	<p>Remember to ask for the Safety officer</p>

		officer	<p>FORWARD or FORE means ahead, or on the way to the bow/front</p> <p>AFTER or AFT means behind, or in the direction of the stern/back</p> <p>UP TOP – going/being up (refers to climbing a mast)</p> <p>GOING BELOW – going/being down (referenced to downward under the deck)</p>	downward under the deck
6	MEETING WITH SHIP SAFETY RESPONSIBLE PERSON	<p>Mr. Y climb the ship stairs together with the crew and the officer in charge of the safety of the ship.</p> <p>The Ship safety officer shows the new crew the MUSTER STATION.</p> <p>The video shows the MUSTER STATION sign</p>	<p>Once you are taken to the Ship safety officer. He will spend some time with you and familiarize you with the safety procedure onboard the ship</p> <p>The Ship Safety officer would also show you the MUSTER STATION, which is the place onboard the ship where the people onboard the ship should assemble after an emergency. Ships Universal MUSTER STATION sign is.....</p>	<p>Do not be in a rush, Make sure you understand everything he tells you. Ask any question that's comes in mind</p>
6	MUSTER LIST	<p>Video shows the personnel reading the muster list</p> <p>Video shows the muster list in details</p>	<p>As part of being proactive about your personal safety, it is important for you to be able to independently learn about the safety procedure onboard the ship</p>	<p>A muster list is a list that contains all the ship specific safety instructions</p>

		Video shows the muster list in various parts of the ship	<p>A muster list is an easy to read notice board that contains all the ship specific safety instructions which is displayed in noticeable areas such as Bridge, Engine room, accommodation alleyways of the vessel so that every crew member on onboard can read it on a go.</p> <p>You should be able to locate the Muster list and be active in learning by reading and familiarizing yourself with the Muster List while onboard the vessel</p>	Possible locations of Muster list Bridge, Engine room, accommodation alleyways
7	GENERAL EMERGENCY ALARM ONBOARD SHIPS	Video shows crew responding positively to the Emergency alarm	<p>It is important to recognise the various alarms used on-board the ship</p> <p>The general alarm on the ship is recognized by 7 short blast followed by a long blast of the ship horn OR 7 short rings followed by a continuous ring depending of the type of vessel. The general alarm is sounded to make the crew on board aware that an incident has occurred</p> <p>When you here it go straight to your MUSTER STATION.</p>	The general alarm on the ship is 7 short ringing of bell followed by a long ring or 7 short blasts on the ship's horn followed by one long blast.
8	ENGINE ROOM AND CARGO CO2 ALARMS	Video shows the visual and audio CO2 alarm	<p>On most ships there is provision to fight fire in Engine room and Cargo hold by filling the spaces completely with CO2.</p> <p>A special CO2 Alarm is sounded automatically before this action is taken.</p> <p>When you hear this</p>	

			alarm and you find yourself in the engine room or cargo room it is important to evacuate the space immediately as breathing the CO2 gas can kill.	
9	FIRE	<p>Video shows a personnel welding or doing hot work</p> <p>Video shows some ships on fire</p> <p>Video shows crews smoking in special designated area and putting out the cigarette properly</p> <p>Video shows someone standing on the ships deck with wind blowing hard</p>	<p>Fire is a big threat to safety onboard ships. Therefore take special precaution against fire while working.</p> <p>The most important step to fight fire is to prevent the fire.</p> <p>Only smoke in specially designated places onboard the ship</p> <p>Never throw cigarette stub overboard the ship as they can be easily blown back onboard the ship, thereby causing fire onboard.</p>	
10	ACTIONS DURING FIRE	<p>Video shows the fire alarm on the ship and a personnel pressing it</p> <p>Video shows the audible effect of the alarm on the bridge</p> <p>Video show the personnel closing the nearest door because of the fire</p> <p>Video show the</p>	<p>If you discover smoke or fire, the first thing to do is to press the red fire alarm button, U will not hear the alarm but the alarm will alert the officer of the watch, who will immediately then send a fire fighting team to the location where you have pressed the fire alarm.</p> <p>To prevent the fire from spreading you should close the nearest door to contain the fire and evacuate the area.</p> <p>You can close fire doors</p>	

		<p>personnel closing the fire door</p> <p>Video shows a person escaping through the fire door with the door closing immediately afterward</p> <p>Video shows a smoke filled corridor and a person crawling out on the floor following the ground light to the exit</p> <p>Video show the emergency escape mask and emergency escape mask signal and someone wearing it and using it in a smoke area</p>	<p>by pressing the button next to the fire door.</p> <p>Feel free to open already closed fire door to evacuate an area but it is important for the door to remain closed after you have passed through.</p> <p>If a Corridor fills with Smoke get as close to the ground as possible and crawl to the nearest exit. The air is better at floor level</p> <p>Emergency escape breathing device are also useful for escaping smoke filled area</p>	
11	ENGINE ROOM FIRE	<p>Shows the machinery spaces in the Engine room</p> <p>Blackout situation in the engine room is shown in the Video</p>	<p>Machinery spaces are complex spaces where you as an unfamiliar person can easily become quite disoriented, particularly during emergencies.</p> <p>Additional factors like the loss of all power and lighting or excessive smoke can make rapid evacuation extremely difficult.</p>	

12	Hot Work PERMIT	<p>A person actively learning the escape routes before starting work</p> <p>Video shows a person using the EEBD to escape a smoke filled area. Shows the EEBD sign and location</p>	<p>There are simple steps to improve the odds of a successful escape.</p> <p>Before any work begins, learn the locations of available exits and escape routes in all directions this is crucial as unfamiliarity with escape routes in fire as being noted as a big contributing factor in the death of one crewmember and two contractors in an engine-room fire aboard a cruise ship in the Caribbean.</p> <p>Also learn the location of Emergency Escape Breathing Devices (EEBDs) and review their proper usage and activation.</p> <p>Lastly and very importantly, always carry a good and fire approved flashlight in your pocket. The light it provides may save your life</p>	<p>To Prevent fire it is compulsory to obtain special Hot work permit from the Safety responsible officer</p>
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		<p>Video show the safety officer giving the hot work permit and asking questions about nature of the hot work.</p> <p>Video shows the examples of hot works</p>	<p>onboard before performing hot work onboard a ship.</p> <p>Hot work is any process that can be a source of ignition when flammable material is present or can be a fire hazard regardless of the presence of flammable material. Common hot work processes are welding, soldering, cutting and brazing.</p> <p>When flammable materials are present, as grinding and drilling become hot work processes</p>	
13	Enclosed Space onboard the ship	<p>Video shows a person obtaining permit from the safety officer and the ventilation of an enclosed spaces before a personnel is allowed to work there.</p> <p>Video shows the personnel being monitored and supported while working in enclosed space</p>	<p>It is also compulsory to obtain a permit from the Safety Responsible officer before entering an enclosed space onboard the ship.</p> <p>Because of zero ventilation, enclosed places can generate and store toxic.</p> <p>Never work in an Enclosed space alone</p> <p>Ensure proper ventilation before entering an enclosed space</p> <p>Remember if a person enters an enclosed space without taking precaution, he or she may suffer unconsciousness and sometimes even death.</p>	
14	Medical Emergency	Video shows a person having a	In case you have any medical emergency,	

		cut and getting medical aid from a ship officer	Consult the Ship Safety responsible officer ASAP Ship officers have some medical trainings and the ship always carry a Medical kit to deal with emergencies	
15	Watertight door/Weather tight Door	Video shows a closing watertight door breaking a simulated limb	Never pass through watertight door when the door is closing, this is extremely dangerous	
16	Emergency Lights	Video shows the emergency exits lights/signs on the ship	There are floor lights and special lights on the ships that guide you to the emergency exit and the Muster station	
17	Man Overboard	Video shows a person working on deck using a safety harness. Video shows A person doing the correct procedure for Man overboard	Be Careful of falling overboard when you are on the ship, it is hard to survive in open water. If you see or hear someone fall overboard, try to keep them in sight and throw a lifebuoy overboard. Yell man overboard as loud as you can and contact the nearest crew member.	
18	Abandoning Ship	Video shows the abandon ship procedure from the alarm to going to the lifeboat	When the emergency situation on board ship goes out of hands and ship is no longer safe for crew on board ship. The master of the ship can give a verbal The general alarm is sounded and you should go immediately to the emergency muster station where the master or his substitute (chief Officer) gives a verbal order to abandon ship Then you will be given a life vest and guided to	

			the lifeboat or life raft	
19	General Safety Procedure	<p>Video shows people using a staircase</p> <p>Shows a new personnel carefully studying the emergency exit near is work place and cabin</p> <p>Show the major safety signs</p> <p>Show the Muster list again in detail</p> <p><i>Show the first person stuck in the engine room doing all the right thing and escaping from the situation in the engine room</i></p>	<p>Never use an elevator during an emergency Always use stairways</p> <p>Be well informed about where emergency exit are located especially where you work and near your cabin.</p> <p>Only open a watertight door if there is no other way out, Use emergency exit instead</p> <p>Understand all the Major Safety signs you will see on the ship</p> <p>Know where to go and what to do in case of emergency</p>	
20	Summary	<p>Show the deck officer giving the final instructions</p> <p>Show a person onboard that is aware of the personal exit plan and zoom out from that person to show the whole ship from above</p>	<p>Remember to always consult and go through the ship muster list, it contains all the necessary safety information you need to know</p> <p>In case of doubt about safety or if you need additional information, consult the ship safety officer</p> <p>Remember to always have a personal exit plan no matter where you are working</p>	

