THE SHORT- AND LONG-TERM EFFECTS OF THE DESIGN, CONSTRUCTION, AND TECHNOLOGY UTILIZED IN A CITADEL ON A SEAFARER, INCLUDING SEAFARER SAFETY AND WELLBEING BOTH DURING AND AFTER A PIRATE ATTACK, AND THE LONG-TERM SUSTAINABILITY OF SEAFARERS SHOULD A PIRATE ATTACK OCCUR

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ABSTRACT

The following paper discusses the history of the citadel, or safe room, aboard vessels and their success rates in the instance of pirate attacks in high-risk areas, such as the Gulf of Aden and the waters surrounding Somalia. By analyzing the design, construction, and technology currently utilized in citadels, and the short- and long-term effects that these topics pose to seafarers after a pirate attack and hostage situation, the sustainability of seafarers in the maritime industry could be predicted, and possibly increased.

Keywords: *Citadel, crew sustainability, hostage, piracy, safe room, technology.*

1. INTRODUCTION

Piracy has been a major issue in the maritime industry for centuries, even after many technological advances have been utilized onboard vessels worldwide. While there are many ways to locate pirates and thwart their attacks in certain areas, there are still ways for the pirates to board the vessel, hijack the cargo, and hold the crew hostage. While cargo and vessels, though costly, are able to be replaced, the prolonged welfare of the crew onboard is sometimes omitted from the vessel's security plan.

While the use of a citadel, or safe room, onboard vessels has somewhat assisted the crew to remain safe in the case of a pirate attack, the construction and technological advancement of the citadel leaves quite a bit to be desired. While most citadels are secure from all outside forces, there have been cases where pirates, when discovering that seafarers had locked themselves inside the citadel as a method of evasion, began firing weapons at the door of the citadel and even pumped smoke into the safe room in an effort to asphyxiate the crew and force them to surrender. Also, citadels are not built to be completely impenetrable. In recent years, the crew of a Beluga ship was taken hostage after seeking safety in the citadel for roughly 48 hours after the pirates were able to open the ceiling of the safe room. This incident and the failed rescue mission of the crew that followed resulted in the death of one of the crew.

The wellbeing of the crew should be a primary concern of any ship owner, and the construction and technological abilities of the citadel could be a primary cause of the positive or negative effects that the crew endures after such an attack. Simple design and construction flaws, such as outside ventilation that could be compromised or the ability of the citadel to be dismantled from the outside, could be the difference between losing and saving an entire crew, cargo and vessel. Could better technology inside the citadel aid in the rescue attempts from the flag state, or other armed forces? Could stronger design and construction of the citadel, as well as more technological equipment inside the safe room, better protect the crew onboard from pirates, therefore keeping the crew's mental health intact after such an event? And finally, could these technological advances, if they were to be utilized in the citadel, help to ensure the safety of the seafarer, and possibly entice him or her to return to sea once the incident has passed?

The organizational behavior exhibited by companies and how their employees are treated by the company during and after a pirate attack may have significant bearing on whether the seafarer returns to sea after such an occurrence. Information will be gathered and analyzed on the employee's safety and wellbeing both during and after a pirate attack and hostage situation, the efficacy of piracy protection onboard vessels that are prone to pirate attacks and the long-term sustainability of seafarers in the industry after such an occurrence. By analyzing the design and construction of the citadel onboard vessels, as well as the technology that is currently being used and technological advances that could be utilized, this research will evaluate if the implementation of updated technological systems onboard the vessel, specifically in the citadel, will increase the return rate of seafarers after a pirate attack, as well as decrease the success of vessels being boarded and hijacked by pirates.

2. VESSELS AT RISK OF PIRATE ATTACK, AND THE EFFICACY OF PIRACY PROTECTION ONBOARD THESE VESSELS

Piracy has been a major source of concern for the maritime industry for centuries, but in recent years figures have been researched and published stating just how prevalent the piracy situation has become. According to the World Shipping Council (2013), in

2011 there were 439 pirate attacks and 45 merchant vessels hijacked worldwide. Of these, 237 of the attacks and 28 hijackings occurred off the coast of Somalia. As of spring 2012, there had been more than 51 pirate attacks, 11 hijackings, and more than 158 hostages taken off the coast of Somalia (*Piracy*, 2013).

While there are personal pleasure craft that are subjected to pirate attacks, the most financial gain for the pirates comes from the larger commercial vessels. Although liner vessels, such as container ships and roll-on/roll-off vessels, are considered to be at lower risk for hijacking based on their higher operating speeds and freeboard, these vessels have consistently been targeted by Somali pirates in recent years. According to the World Shipping Council (2013), in 2010 there were 32 liner vessels attacked by pirates and six that were successfully hijacked. In 2011, the number of liner vessels attacked increased to 65, while only one liner vessel was hijacked (*Piracy*, 2013).

As of 2006, the United Nations Office on Drugs and Crime reported that the majority of pirate attacks off the coast of Somalia occur within 350 miles of the coastline (*Maritime Piracy*, 2010), and vessels have been more adamant about remaining out of range of the pirates. However, Somali pirates are now using hijacked merchant ships as "mother ships" to carry out attacks in the north Arabian Sea and near the coastline of India, which is more than 1,500 nautical miles from their home country (*Piracy*, 2013).

The number of pirate attacks in the Gulf of Aden and Red Sea has dropped from mid-2012, which is likely due to the increased active military action on suspected pirate skiffs, and preventative measures used by the possible target vessels (Piracy & Armed Robbery News & Figures, 2013). These preventative measures include the use of citadels along with the employment of Privately Contracted Armed Security Personnel (Piracy & Armed Robbery Prone Areas and Warnings, 2013). While the threat of pirates is still prevalent, the IMB recommends that seafarers and Masters not become complacent while travelling through this area. According to Piracy & Armed Robbery Prone Areas and Warnings (2013), all vessels in this area are "advised to take additional precautionary measures and maintain strict 24 hours visual and radar anti-piracy watch using all available means." These warnings state that the crews keeping watch on these vessels should be on the lookout for small boats that appear to be converging on their vessel (Piracy & Armed Robbery Prone Areas and Warnings, 2013). If the suspected pirate skiffs are sighted early enough, the Master will have more time to increase speed and take evasive maneuvers to escape the pirates, while requesting assistance from other vessels or military agencies in the area.

3. EMPLOYEE'S SAFETY AND WELLBEING BOTH DURING AND AFTER A PIRATE ATTACK OR HOSTAGE SITUATION

Although there are piracy protection methods onboard vessels which are actively utilized, pirates are still able to wreak havoc on the crew of targeted vessels. According to *The Human Cost of Somali Piracy 2011* (2012), there were still many crimes committed by pirates against seafarers in the High Risk Area in 2011, who were either on ships that were fired upon, boarded, or hijacked; sailors aboard personal yachts; or people onshore, including humanitarian aid workers and tourists.

The Human Cost of Somali Piracy 2011 (2012) states that in 2011 a total of 3,863 seafarers were assaulted by pirates during the initial stages of an attack by firing weapons such as assault rifles and rocket-propelled grenades, and 968 seafarers came in close contact with pirates aboard their vessel. Of these 968 individuals, 413 were rescued from citadels by naval forces after waiting for hours or days, while the pirates attempted to breach the safe room (*The Human Cost of Somali Piracy 2011*, 2012). In 2011 a total of 1,206 individuals were held captive by pirate gangs, including 555 seafarers who were attacked and taken hostage in 2011, 645 that were captured in 2010, and six tourists and aid workers (*The Human Cost of Somali Piracy 2011*, 2012).

Of the hostages that were held in 2011, a total of 35 died while still in the custody of pirate gangs. Eight of these hostages were killed by the pirates either during the attack or after they were taken captive, eight died from disease or malnutrition while in the custody of the pirates, and the remaining 19 were killed during rescue efforts by naval vessels or attempting to escape (*The Human Cost of Somali Piracy 2011*, 2012). The majority of these individuals were being used as human shields by the pirates when faced with opposing naval forces.

All hostages face the risk of violence day after day while in the hands of pirates, and are subjected to a range of inhumane treatment in violation of their basic human rights. Many times, the hostages are subjected to restricted freedom of movement and privacy, in addition to living with the constant threat of physical and psychological abuse. The living, hygiene and sanitary conditions onboard hijacked vessels can decline rapidly, and is generally not improved throughout captivity.

The Human Cost of Somali Piracy 2011 (2012) gathered post-incident reports from 23 vessels that were held under pirate regimes and released in 2010 and 2011, which described the experiences of hostages. While the total number of crew onboard these vessels was not listed, at least three seafarers from the reporting vessels died after release as a direct result of their treatment during captivity. The physical and psychological abuse suffered by the hostages were reportedly triggered by the pirates' basic ignorance regarding the workings of a ship, a breakdown of or slow progress in ransom negotiations, disagreements among the hostages, and better treatment to some crew in exchange for information on others (*The Human Cost of Somali Piracy 2011*, 2012).

While the range of abuse suffered by the hostages is wide, some hostages received more severe forms of abuse at the hands of the pirates. No direct numbers are given, but *The Human Cost of Somali Piracy 2011* (2012) states that half of all hostages in 2011 were subject to moderate abuse by their captors which included punching, slapping, and pushing. Roughly 10 per cent of the hostages were subject to more extreme abuse, such as being tied up in the sun for hours, being locked in a freezer, and having fingernails pulled out with pliers (*The Human Cost of Piracy 2011*, 2012).

The psychological effects that were suffered by hostages varied, as well as the physical effects. Many hostages are able to cope with their experiences after their release, but others may require more assistance. The psychological effects that are suffered by seafarers that are not taken hostage – rather, they are subjected to weapon-fire in unsuccessful attack attempts – are still serious health issues. While these attempted attacks may not be successful in obtaining hostages for the pirate gangs, they are the maritime equivalent of attempted murder and should not be brushed aside when looking at the psychological impact on seafarers.

The Human Cost of Somali Piracy 2010 (2011) states that there was very little official information available to the public on pirates' treatment of hostages during captivity. As a result of the lack of information, the Declaration Condemning Acts of Violence Against Seafarers (the Washington Declaration) was formed, which commits flag state signatories to submit reports on seafarer welfare during captivity to the International Maritime Bureau. As of June 2012, four of the largest flag states – Liberia, the Marshall Islands, Panama, and the Bahamas – have signed on to the document. The intent of the Washington Declaration is to provide a reliable source of information for organizations looking to assist seafarers who have either been subject to a pirate attack or who are at risk of an attack.

4. EFFECTS OF SEAFARERS IN THE INDUSTRY AFTER PIRATE ATTACKS AND HOSTAGE SITUATIONS, AND PREVENTION MEASURES ASSOCIATED WITH PIRATE RISKS

The Marine Piracy Humanitarian Response Programme has issued a Good Practice Guide for Shipping Companies and Manning Agents for the Humanitarian Support of Seafarers and their Families, which was developed to support seafarers and their families' through three phases of a piracy incident; pre-departure, the crisis, and post-release/post-incident (*Good Practice Guide*, 2011). According to this report, an increase in the number of pirate attacks has increased awareness of the risk of such incidents amongst seafarers, and seafarers sailing in piracy risk areas are apprehensive due to fear of what might happen when they are onboard. The fear of captivity, in terms of physical conditions and duration, may provoke anxiety from initial awareness of an impending attack. Many seafarers feel that they are "worthless as individuals and pawns in the bigger ransom negotiations" (*Good Practice Guide*, 2011).

There are certain things that could help to reassure the seafarer who can relate to these feelings, including knowledge of a pre-planned use of convoys with associated security resources and familiarity with the protective measures adopted by the ship, including muster points and secure areas such as a citadel, decreases the feeling of physical vulnerability and helplessness (*Good Practice Guide*, 2011). According to this Guide, knowledge of a pre-planned method of communication with the ship owner or nearby security sources to indicate an attack and call for assistance is considered by seafarers to be of the utmost importance.

Psychological reactions to traumatic experiences can occur within days, weeks or months of an incident. The Good Practice Guide states that the probability exists for re-stimulation of reactions when sensory reminders such as similar smells and sounds occur (2011). Post-Traumatic Stress Disorder may be seen in some cases, as well as depression, anxiety disorders, and substance abuse, which may require mental health professionals to moderate. The increased stress for released hostages and their family members may be reported when the seafarer returns to work and when travelling into pirate risk areas. Some seafarers may avoid seeking help for fear of their future employment (*Good Practice Guide*, 2011).

After prolonged captivity, there may be periods of anger, hope, despair, feelings of helplessness, and potentially renewed shock reactions at differences in physical deprivation or inhumane treatment experienced (*Good Practice Guide*, 2011). Seafarers that have dealt with pirate attacks and/or hostage situations, along with their families, may experience a period of adaptation back to "normal life" after the experience. The seafarer may not wish to share their memories of the experience, but these memories should be processed so the seafarer can deal with them on a daily basis (*Good Practice Guide*, 2011). The seafarer not successfully coping with these memories may prevent the seafarer from returning to their daily lives or affect their ability to return to work.

One safety tactic that could be easily utilized by crew onboard vessels boarded by pirates is the use of a citadel, or safe room. The prevention of hostage situations by using a citadel offers the possibility of retained crew after such an incident occurs, by offering psychological piece of mind to the seafarer. Not only will the seafarer be safe in the event of a pirate attack, but they may also be more at ease even if an attack does not occur when the vessel is travelling through high-risk areas.

5. HISTORY OF CITADELS ONBOARD VESSELS

According to the Greg Girard (2013), a citadel is a

"designated pre-planned area specifically built into the ship where – in the event of imminent boarding by pirates – all crew can seek refuge with the objective of preventing the pirates from gaining control of the vessel." This safe room should contain methods to control the vessel, emergency rations, a safe air supply, good external communications, and a closed-circuit television control to view areas onboard.

The safe rooms onboard vessels have been rather successful, according to Greg Girard (2013), and have even improved the effectiveness of naval forces during rescue attempts. If the crew is safely inside the citadel, it can then allow the rescuing naval forces, who in the past have been hesitant to intervene on a vessel once the pirates are on board for fear of harming the crew, to engage the pirates knowing the crew is safe.

6. SUCCESS RATE OF CITADELS

In 2011, at least 3,863 seafarers were fired upon by Somali pirates armed with assault rifles and rocket-propelled grenades (*The Human Cost of Somali Piracy 2011*, 2012). Of that number, 968 seafarers faced armed pirates who managed to board the vessel. According to *The Human Cost of Somali Piracy 2011* (2012), 413 of these seafarers were rescued from citadels on their vessels by naval forces after waiting for hours or days, while the pirates attempted to break into the safe room.

Glen Forbes (2011) states that the recent successes in the use of citadels have only gone to further endorse their good reputation. In April of 2011, a member of Marine Pirate Busters was a Team Leader onboard the *MV Arrilah-I*, which was attacked by pirates. This individual stated that the "crew hid in the citadel to evade the pirates. It appears they not only entered a safe room but were forced to don breathing apparatus. The pirates, on discovering that the seafarers had locked themselves in a citadel, began shooting at the door and then pumped in smoke in an effort to asphyxiate the crew and force them to surrender" (Forbes, 2011). The crew not only had breathing apparatus with them, but food and water as well as equipment to communicate with nearby ships and aircraft. From this safe room, the crew also had the ability to disarm the ship and prevent the pirates from operating the vessel.

There were 21 sailors and three security guards onboard this vessel, and all were able to enter and remain in the citadel during the entirety of the attack. Rhynhardt Berrange, the head of Global Maritime Security Solutions who provided the security guards, stated that the safe room and other defense precautions, such as regular anti-piracy emergency drills, were key to keeping the crew safe. Mr. Berrange stated that the pirates "continually tried to breach the citadel. The successful resolution of this incident demonstrates the importance of adopting best management practices. Safety standards must be in place for dealing with all emergency situations" (Huang, 2011). The pirates were never able to successfully flush out the captives from the safe room, and all of the crew was released from their hideout after military personnel stormed the ship, forcing the pirates to surrender.

Pirates have become familiar with the use of a safe room onboard vessels, and have gone so far as to complain to the ship owner about the use of a safe room. In September 2010, the *Magellan Star* was boarded by pirates in the Gulf of Aden, off the coast of Somalia. Even though this vessel was travelling in a convoy, which is usually a sound security measure, the other vessels spread apart and caused one vessel to become a target. The crew fled from the attacking pirates into a safe room onboard the vessel, which was supplied with drinks, medical equipment and other supplies, including a satellite phone (*Pirates and the Panic Room*, 2010). According to the ship owner, precautions were taken in case the pirates decided to sink the vessel when no hostages could be taken, and an emergency exit was incorporated into the safe room so the crew could get off board at any time. The ship owner states that "what is most important is that they could not take any hostages" (*Pirates and the Panic Room*, 2010).

One other precautionary measure that was taken during the attack on the *Magellan Star* was the captain setting up the engine so that it could not be started in the usual way. The ship owner stated that the pirates, upon finding no crew in sight onboard, called the shipping company in desperation, wanting to know where the crew was located. The pirates complained in the same phone call that they were not able to start the engine as usual. This vessel was held for 22 hours by pirates, but was released without any further incident (*Pirates and the Panic Room*, 2010).

While there are success stories of the citadel onboard vessels, there are still instances where the pirates are able to board the vessel and retrieve the crew from the safe room. On January 22, 2011, Somali pirates captured the *Beluga Nomination* in the Indian Ocean. The crew hid in the citadel onboard the ship for the first 48 hours of the incident, but then pirates were able to open the ceiling of the safe room and take the crew hostage (*Pirates Enter Safe Room via the Ceiling*, 2011). It was not further reported if the crew was released, or if any injuries or fatalities occurred.

7. ANALYZING DESIGN AND CONSTRUCTION OF CITADELS

There are many vessels in service today that have working citadels onboard, but there are still many that are not equipped with sufficient anti-piracy measures. In the case of the *Magellan Star*, the crew was fortunate, as the ship owner has a total of 71 ships and has not been able to modify all of them with safe rooms. The ship owner states that these modifications take time, especially with the large supertankers that are at sea for many days at a time. And while these vessels are still travelling in the Gulf of Aden, the ship owner reassures Spiegel that they do not send vessels on jobs with a clear

conscience, and realizes that over time the pirates will learn more about the vessels and further invest in their profession (*Pirates and the Panic Room*, 2010).

Current safe rooms onboard vessels are stocked with provisions and medical supplies for the crew and any other personnel who may be onboard, as well as satellite phones and GPS locators for communication with shore-based agencies, steering mechanisms and emergency engine shut-off switches to keep the vessel from being directed by the pirates. To protect the crew from the possibility of the pirates sinking the vessel when negotiations do not turn in their favor, emergency exits that are otherwise undetectable by the pirates are incorporated into safe rooms onboard some vessels (*Pirates and the Panic Room*, 2010).

There are now companies that specialize in the safety of vessels and the installation of equipment in safe rooms. One such company, Fleetcom, offers a total package of The Citadel Safe Room/Anti-Piracy solution. According to their website, this solution aims to "allow crews on a vessel under attack by pirates to retreat to a safe area while still maintaining communications links with the shore" (Citadel Safe Room/Anti-piracy, 2012). The Citadel safe room solution includes an Iridium satellite voice service and GPS reporting, which are kept separate from the usual vessel communications systems to remain undetected by the pirates. This product is installed in the safe room, providing emergency and periodic GPS reports as well as voice calling services. A battery backup system can power the system for 24 hours in a powered standby mode, or for a few days in a periodic mode. This system includes an outdoor transceiver, cable, lockable cabinet, corded phone and optional battery backup. The key features of this system are Iridium voice communication, GPS emergency and periodic reporting, single cable, easy installation anywhere on the vessel, no antenna distance problem, and complete global coverage.

8. CONCLUSIONS

While the reported accounts of pirate attacks in the high risk areas of the Gulf of Aden and the coast of Somalia seem to be decreasing, other hot-spots are becoming prevalent. In recent months the western coast of Africa has become a growing area of concern regarding pirate attacks. While the Nigerian Navy has become more adamant regarding the punishment of captured pirates, the threat still remains. On August 25, 2013, the Nigerian Navy "killed six pirates and injured one other in a gun battle" off the coast of Calabar in Nigerian and Cameroonian waters (Schuler, 2013).

While the actions of the Nigerian Navy may deter some pirates from taking action against cargo vessels in the future, the threat of piracy remains in other areas of the world. With threats occurring in otherwise safe areas, even in areas that are deemed protected due to political agreements, the safety of the crew onboard may be a determining factor in continuing the operation of the vessels. Benefits such as health insurance and paid vacation may not be all that is required to entice mariners to the employment opportunities onboard cargo vessels worldwide, and the use and performance record of safe rooms aboard these vessels may become a deciding factor in which contracts they undertake.

The basic amenities that are currently included in safe rooms onboard vessels may be successful in their actions, but there are still setbacks in the construction and design of the citadel. If an enclosed ventilation system is installed in each safe room, the attacking pirates may not be able to "smoke out" the crew in the safe room by compromising their air. Also, the location of the safe room should be intently considered before construction begins, as to not be too obvious to the pirates and to deter the attacking pirates from firing upon the safe room.

Citadels onboard vessels may be viewed by some as a luxury and not a necessity, which could have a negative impact on the technology that is used when creating the safe room. As stated by the owner of the *Magellan Star*, not all vessels are currently equipped with a safe room, even though they are travelling in high-risk areas off the coast of Somalia and in the Gulf of Aden. The construction of safe rooms onboard all vessels travelling in this area, while costly, could decrease the success rate of ransom payments to pirates, which could in turn decrease the amount of attempts made by pirates to board or hijack vessels.

While the use of citadels onboard vessels have minimized the number of seafarers taken hostage, the use of citadels have not caused the pirates to abandon their attempts to board a vessel. However, citadels have impacted the industry by giving the crew the opportunity to remain safe during a pirate attack, preventing the pirates from gaining control of the vessel, and offering naval forces time to reach the vessel and engage the hijackers. By requiring a safe room to be built in each vessel that will traverse the high-risk areas surrounding Somalia and the Gulf of Aden, the safety of not only the crew could be heightened, but the sustainability of crew after such an attacked may be increased.

If a ship owner offers employment on a vessel that houses a citadel, be it state-of-the-art or a simple room with the basic amenities, experienced crew may be easier to come by. If that vessel is in the unfortunate circumstance of a pirate attack, this citadel could save not only the lives of the crew, but also the vessel and cargo onboard. Should a citadel protect the crew onboard from becoming hostages, that crew may be physically and mentally able to return to work quickly and remain in the industry longer than if they were taken hostage by the pirates.

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