

Outlining the Challenges of the COVID-19 Pandemic on Africa's Maritime Industry: The Case of Marine and Seafaring Professionals

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Abstract

Despite the 'Key Worker' status of seafarers in moments of demonstrable selflessness—ensuring an adequate supply of food, medicines, consumables such as Personal Protective Equipment (PPEs), and energy—there is a lack of genuine interest in their concerns, leading to various calls from major stakeholders such as the United Nations (UN) and International Maritime Organization (IMO) associated with COVID-19-related policies and regulations impacting the wellbeing of marine professionals and crews. Thus, to what extent are non-traditional seafaring nations of Africa impacted The study examines concerns identifying and investigating: implemented COVID-19 policies and regulations, their impact on maritime operations and crew 'wellbeing'; contingency measures and innovations aiding mitigate responses for minimal challenges to seafarers and marine professionals. The case study approach focuses on West Africa's maritime corridor, examining operations in Ghana, Ivory Coast, Liberia, Nigeria, and Angola to a host of varied ports and offshore installation operations. Direct field observations, survey questionnaires, and interviews of expert or 'eyewitness' accounts deployed via phone calls, online social media, and emails were carried out. The study finds that the international labor convention (MLC 2006) was not complied

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with. Embarkation quarantine and testing measures for offshore Ghana and Angola could not prevent outbreaks of cases on-board FPSO units, although the process identified cases. The stigma of cases amongst the crew was prevalent in the first six months of the pandemic declaration. Of the surveys conducted among 71 vessel crews, 32.14% were certain of positive cases on their various job sites. Only 19% willingly addressed issues of their proximity to the virus. Thirty percent complained of uncertainty spered by rumors as fuelling poor mental health. 91.06% showed support for IMO-led interventions. Mitigating measures included increased internet and telephone access, plus extensive boarding protocols. The vaccine inoculations remained low within the region for mariners. Findings suggest the need for more research.

Keywords: *Covid-19 impact on crew management, Health crises on marine operation, Policies and regulations in maritime, Maritime operations and pandemic, Offshore operations in Africa*

1. Introduction

Annually, international trade is said to be composed of 80 percent of the value of maritime trade contribution (two-thirds of trade volume), which is led by both national and private seaports [1][2]. Before the maritime industry, men and women who dedicate their lives to the seafaring trade (included are all maritime professionals) were forced to maintain operations under very difficult, stringent, unhealthy, and odd circumstances as a result of the global emergency towards ensuring that the fundamental sanctity of human life was sustained with the much-needed supplies of food, energy and health care products [2]. According to BIMCO, Manpower Report [3], the global supply of seafarers was estimated at 1,647,500 seafarers, of which 774,000 are trained officers and 873,500 are trained ratings, compared to 1,371,000 with 624,000 officers and 747,000 ratings estimated five years earlier. Thus, with a shortage in supply estimated at 102,500, the demand forecast for 2020 and 2025 stood at 11.7% and 18.3%, respectively. This potential market demand since the last decade has become a commodity of interest to nontraditional seafaring nations and regions across the world, particularly among African nations who seek to exploit the advantages of global labor supply shortfalls in training prospective maritime professionals and seafarers² at various levels of competencies for foreign exchange earnings. Although the end of 2019 in the global maritime industry set forth with great optimism [2][4]—thus in marking the new decade, the serious challenges of compliance with newer environmental regulations, need to maintain and increase technical innovation in a ship and engine design, among other global concerns, were compounded by the World Health Organization's (WHO) March 11 declaration of the coronavirus pandemic [2][5].

According to A. S. Sacket et al. [2], the emergency declaration resulted in an initial spontaneous series of health-inspired restrictive interventions and policies – a reaction across the nations of the world that naturally can be described as an 'upfront' to migrations. Thus,

² The term seafarers are used generically to refer strictly restricted to the traditional role of a ship's crew member or individuals trained and certified as competent to discharge a responsibility at sea. Therefore, the term marine professional is not limited to only seafarers but individuals with nontraditional roles on ships who may work on board for a period. Hence, this term may be used interchangeably as it ascribes to the larger pool of diverse careers of marine personnel whose duties also encompass ship site or boarding marine vessels for shorter or longer durations. For example, are subsea engineers and marine surveyors?

one of the most fundamental pillars of globalization is averting potential worldwide health catastrophes.

As large as the African continent appears, it is thus constituted by 54 nation-states with a population of over 1.26 billion as of 2016 [6], currently estimated at 1,340,598,000 in 2019, of which the sub-Saharan African region constitutes 1,094,366,000. These countries are reliant on international trade during the health crisis with the mode of spread of disease mitigated via the implementation of foreign and localized travel restrictions, which has also closed various national borders. Ghana, as a case in point, was closed to international travelers as of March 30, 2020 [2][7].

As many seafarers across the world, particularly of the fractional population within Africa, continue to face numerous difficulties, largely spared by the COVID-19 pandemic. The consequences of rapid job losses, to various health problems, skyrocketing cost of living, midway contract forfeitures, overstay of contracts, unpaid wages for times on board, and forced or unconsented reduction in wages under the guise of COVID-19 cannot be overstated as a bad streak of seafarer business. Regardless of the times, seafarers (those on board ships and those at home in search of vessels, particularly African seafarers) are required to pay the exact cost for their STCW 95:2010 (as amended) documentation and training renewals without any financial support or any form of COVID-19 relief. A. D. Sacket et al [2] suggested that seafarers and marine professionals in their daily duty are not alien to absorbing all forms of occupational risk and therefore understood the risk they faced with COVID-19 health crises in terms of risk to their health while on Jobsite. This understanding justifies the reason for the call and the resolution passed to elect the seafaring and marine professionals working group as "Key Workers" to limit the extent of impact COVID-19 interventions could have on their daily tasks.

Hence, the study examines the impact of the crises on these identified objectives: thus, identify and investigate some of the current policy implementations and practices regulating the seafarers amid COVID-19; develop an understanding of key aspects of the maritime operations and seafarer 'well-being' impacted by the COVID-19 crisis; and determine some of the best contingency measures and innovations as the most appropriate mitigating response.

Therefore, upon successful examination of seafarers' concerns amidst the pandemic, a resolution in this study should help counter future crises and consequential fallouts for the maritime industry. The significance of this study is that the findings will barely lay the real challenges experienced in the African maritime industry while helping inform policy decisions and regulations in the future. It will also espouse the best approach to balance the regulations and the welfare of maritime professionals (thus seafarers' 'well-being') while helping sustain high-integrity operations in a world emergency.

2. Literature Review

2.1. Overview of COVID-19 health crises in the maritime industry

On March 11, 2020, the declaration of a pandemic-scale virus worldwide set in motion a series of localized and international restrictions—the IMO Secretary-General (S.G.) per Circular Letter No.4204/Add.14/Rev.1 Five October 2020 insisted on forcing a huge number of seafarers to indefinitely stay at sea [2]. Essentially, the situation buttresses [8] claim which [2] affirmed that the new coronavirus was “causing significant problems for the maritime industry, with volatile supply and demand, port closures, and difficulties with crew changes.”

Therefore, we examine the generic features of this virus, the current state of the global pandemic and health crises, and how it impacted maritime operations throughout the crisis.

The newly identified SARS-COV-2 (also widely referred to as COVID-19) is a type of virus that emerged from China in December 2019, resulting in the worldwide pandemic of respiratory infections [9][10]. Listed symptoms included “coughs, chills or fever, shortness of breath or difficulty breathing, muscle or body aches, sore throat, loss in taste or smell, diarrhea, headache, fatigue, nausea or vomiting, and congestion or running nose”, as described in [2]. Thus, infections are said to be severe, leading to eventual death in some cases, and the mode of spread is from person to person, whereas diagnoses are solely through laboratory testing. According to the World Health Organization (WHO) [11], of the number who may develop symptoms, close to 80 percent recover naturally from the disease without hospital treatment. Fifteen percent, however, become seriously ill and may require oxygen, whereas the remaining 5 percent become critically ill and may need intensive care.

Given that anyone can fall ill with COVID-19, individuals within the age of 60 years plus, as well as people with chronic underlying medical problems such as high blood pressure, heart, and lung problems, diabetes, obesity, or cancer, remain at higher risk of becoming seriously ill. It is, however, unclear what the long-term effect of COVID-19 is and thus remains the focus of many clinical researchers, including those within the WHO [12].

While the global cumulative infection rate stood at 40,118,333 as of October 18, 2020, and the COVID-19 death rate was 1,114,749 [9], fast-forwarding to July 16, 2021, the global count of total infections stands at 188,655,968 confirmed cases, including 4,067,517 deaths. Africa's share of confirmed infections at the same time stood at 4,531,636, including 106,074 infection deaths [12]. With daily updates, A. D. Sackey et al [2] suggest a continuous rise despite progress made, by WHO [12]. continue to insist, prevention of infection and spread implies personal and group hygiene such as the continuous and frequent use of running water for hand-wash, the need to bend your elbow over when coughing, staying at home when sick, and when going into public spaces is inevitable, wearing cloth face-covering while social distancing if possible. A. D. Sackey et al [2], legally mandating basic personal hygiene has changed the phase of public-private interactions.

Although early treatment was through therapeutic drugs and nutritional supplements, the increase in vaccines spearheaded by the United States of America began to bear fruit in the last quarter of 2020 after development commenced as early as March 2020 [2][9]. On November 9, Pfizer of New York and BioNTech (a German company) announced the historic breakthrough of their coronavirus vaccine with an efficacy rate exceeding the 90 percent threshold. Subsequently, by December 11, the US Food and Drug Administration (FDA) granted its first emergency usage authorization for coronavirus vaccines [13]. This was consequentially followed by the WHO, EU, and many other states as vaccine development successes began to spread across pharmaceutical industries worldwide. July 15, 2021 cemented a total of 3,402,275,866 administered vaccine doses [12].

Within the maritime industry, the cruise ship industry and naval vessels were among the first marine crafts to have been hit with the spread of infection in the early days, suggesting the potential health dangers faced by seafaring and marine professionals at the time [2]. Fortunately, or rather unfortunately for marine professionals and seafarers engaged in maritime operations within Ghana like other African nations during the early stages of the pandemic, have been faced with [2] extreme health scrutiny and ‘private invasion.’ According to A. D. Sackey et al [2], the seaport of Tema Port and the Kotoka International Airport (KIA) within the nation's capital were subjected to surveillance as well as internal and external travel restrictions. The Takoradi seaport located within the western region served as an

international shipping route and a hub for offshore oil and gas operations in Ghana but was not spared by external travel restrictions. Operations of ships at these seaports were restricted to ships already berthed, those awaiting berth allocations while in anchorages, and those en-route offshore locations under the government's policy guidelines —subject to the rapidly changing situational timeline and data.

Therefore, the assessment of Covid-19 impact in the maritime industry segregated to include [14], (i) concerns for the provision of health and safety protection of crew and vessel worksite, the 58 workers who tested positive for COVID-19 at the oil production facility operated by Tullow Oil off Ghana's western coast in the Gulf of Guinea [15], is an example of the many incidences observed across the continental waters of Africa and the entire world's oceans, other concerns included (ii) ensuring crew is not marooned while (iii) preventing a halt in the global commodity supply system [2][14] – suggesting their inter relativity, except under extraordinary circumstances. Consequently, each of these challenges is discussed in subsequent sections of the study.

2.2. Shipping and marine operations amid the COVID-19 health crises

The role of sea transport in global commodity shipping transport over the past one and half years amid the pandemic cannot be overemphasized—thus, a period that saw unprecedented uncertainty and chaos across all nations, industries, and commerce. Over the years, the African coast, like the rest of the world's coast, has been flooded with activities that maritime experts have classified into two broad categorical industries, namely, the maritime industry (thus refers to traditional commercial marine ventures dedicated to marine cargo transportation) and offshore energy industry (refers to the exploitation of resources such as hydrocarbon resources found under the sea as well as the most recent efforts into offshore wind farm projects), which all constitute the global commercial marine industry [2][16].

While traditional commercial shipping maritime operations simply involve a single or more ships completing a voyage leg of ordinary carriage of goods from one port to another for affreightment, non-traditional offshore marine operations ordinarily involve several specialized ships of varying capabilities engaged in varying capacities on a single project, such as the development of an oil and gas production field under an engineering contract. This goes to suggest that the men and women forming a ship's crew who dedicated their time and service to trade during the pandemic had to work under very difficult situations on board the various ships. The impact of the COVID-19 pandemic could therefore be examined in regards to the ship manning structure of the various ships as well as the type of trade, in this case; reference is to vessels classified under the Safety of Life at Sea convention (SOLAS 74) as passenger vessels, which tends to determine the levels of social, physical and psychological health impact they could suffer. Although there are no universally applicable definitions for the various ship types, specific descriptions and names are applicable per treaties and conventions of IMO such as SOLAS 1/2 [17].

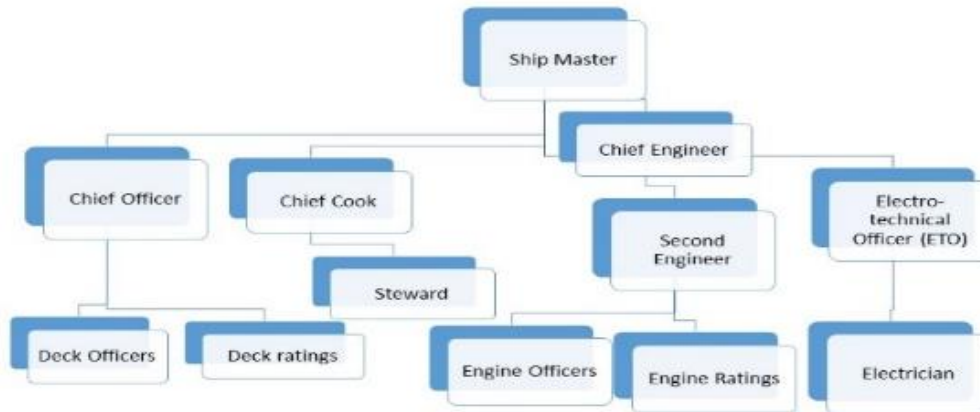


Figure 1: Ship manning structure per minimum manning requirement based on [20] description

Therefore, ship inspector [18] indicated in an online article that the required crew size of any vessel under operation is dictated by the document referred to as the “*Minimum Safe Manning Certificate*,” which stipulates the minimum number of personnel needed to safely navigate and operate the said vessel from position A to B under the Maritime Labour Convention, MLC 2006. He further noted that the requirement did not take into account other considerations, such as company administrative requirements. Hence, vessels often do have more crew beyond the required *Minimum Safe Manning Certificate* to aid in the distribution workload necessary to ensure adequate rest and effective performance from the ship’s crew. According to J. Toepfer [18], a typical marine vessel crewing is shown in [Figure 1].

For the non-traditional maritime industry, with particular reference to the commercial offshore industry dedicated to providing global energy commodities such as fossil fuel and wind energy [19], specialized marine vessels are ordinarily used in the development of these fields. These highly specialized ships are operated beyond the minimum manning requirements during engagement in offshore marine operations [2], with each crew serving a straight 12hr shift. This reverts to the minimum manning requirement (popularly referred to in the offshore industry as skeleton crew) and routes 8- to 10-hour work schedules with adequate rest periods per MLC 2006 requirement when not engaged in contracted offshore operations. Early news reports raised varied concerns for crew wellbeing in this regard – noting difficulties in crew change and extended stay, whereas overtime in some instances is unavoidable in ordinary ship operations onboard. According to A. D. Sackey et al [2], most of these specialized ships with capabilities beyond simple navigation to maintain dynamic positions at sea, as well as undertaking delicate ship maneuverings, serve as engineering construction platforms on which subsea-to-surface heavy-lift construction, subsea surveys, pipeline production, and decommissioning operations are undertaken.

Operations may include routing lifting to heavy-lift operations with cranes, subsea surveys and construction installations with remotely operated marine vehicles (ROVs), diving operations, and so forth [2][16][20]. Therefore, the manning requirement of these vessels when in operation varies from when not in operation per load of work at the given time. In addition to the excess ship crew per the minimum manning requirement, SOLAS 74 classifies the extra men and women who make up the offshore project crew as passengers. Hence, these

vessels, in line with safety when engaged in projects per the SOLAS 74 convention, are classified as passenger vessels throughout operations. Vessels of this nature can accommodate as high as over 100 plus crew [20], who are all under the command of the shipmaster while on board –consultation with the offshore construction manager (OCM).

With this background, it is easy to appreciate how such a COVID-19 impact may have on both segments of the commercial marine industry in terms of manning and operations. It is worth noting that due to local content regulations governing the offshore industries of Africa, which serve to increase the labor force of African descent on the various offshore projects within their national boundaries, the pandemic's impact should be relevantly studied. The health risk infection of COVID-19 therefore may be limited to vessel crews, and their interruptions of shore maritime professionals [2]. Given that the benefit of the SOLAS 74 regulation is to ensure adequate design for the safety of life at sea at all times, one does easily observe the convention focused on safety, does adequately cater to the health of crew beyond the mere requirements in the vessel design –thus making arrangement for medical aid and staff, as well as having hospital cabin on-board. However, concerning infectious diseases that are potentially airborne, it remains unclear whether vessel accommodation ventilation designs should be recommended in the future. This remains essential if progress is to be made in understanding the nature of outbreaks that occurred onboard cruise vessels, among others. It is also, however, unclear at what stage, whether before mobilization, during marine operations (at sea, port, and offshore facility locations), and during disembarkation periods, infections occur. These stages of events are at the core of vessel crew management pertaining to the International Labour Organization, ILO and MLC regulations. Therefore, the contention with vessel crew management operation is discussed in the proceeding paragraphs.

2.3. Premobilization, mobilization, and demobilization amid COVID-19 constraints

Ship crew mobilization is a huge human resource management market within the maritime industry with major third-party players such as V. Crew of V. Group with a network of over 44,000 seafarers [21] and Worldwide Recruitment Solutions (WRS), which sources crew for various clients across the world. In this case, the abovementioned subjects are examined concerning the two critical concepts of crew management, thus ship crewing and crew change management. According to the Marlow Navigation [22], the concept of crew management for ships ordinarily incorporates a variety of activities that are handled by crew management companies and their contracted manning agencies. Thus, the responsibility for providing the manning capacity needed by vessels occurs under a crew management contract between the ship owner and crew Management Company. These activities encompass the sourcing, recruitment, selection, and deployment process. Other activities include scheduling, training/upgrading programs, and ongoing management of seafarers engaged on the vessels under crew management contracts. Essentially, crew administrative aspects, such as “payroll services, travel arrangements, insurance, assistance with health, banking & financial services, career guidance, communication duties, and team-building and family/social programs”, are catered for [22]. The challenge of obtaining the required sourcing, mobilizing, and deploying hundreds of multinational contractors around the world [23], particularly in the offshore sector for a project, at the end of the first quarter of 2020 was compounded by the onset of the global pandemic declaration and a ‘tyranny’ of heavy travel restriction [2].

2.3.1. The concept of ship crewing

Ships operated in all waters are required to meet the minimum manning requirement at all times to ensure the safety of life, operations, and the overall well-being of the crew. These measures are strictly enforced by the vessel flag state in support of port states. This is the reason behind the continuous desire for crew change despite the raging pandemic. Historically, crewing of ships has been achieved for various ship divisions, namely, (1) the deck department (with the primary responsibility of steering, keeping lookout, handling lines in docking and undocking, and performing at-sea maintenance on vessel hull and no machinery components), (2) the engine department (thus operated machinery and performed at-sea maintenance), and (3) the stewards' department (which does the work similar to hotel staff for crew and passengers) (see Fig 1 detail structure). The current sourcing of seafaring staff with the ranks of ratings for the international shipping industry is majorly pooled from developing countries, especially the Far East and South-East Asia. This includes the Philippines (Filipino seamen), India, and China. OECD countries, including North America, Western Europe, and Japan, serve as major sources for officer recruitment. However, officers are increasingly recruited from the Far East and Eastern Europe (i.e., Ukraine, Russia, Croatia, and Latvia). Others include Greece, Japan, and the United Kingdom [24].

African seafaring, as it stands today, constitutes only 2 percent of the world pool [25]. However, researchers have no sighted data on the total marine professional population on the continent, especially the current population working within offshore locations and port facility locations that periodically interface with ships. Nonetheless, news of positive COVID-19 test cases that occurred offshore Ghana [15], for example, signals the impact of COVID-19 subtended on the industry and the various interfaces despite the stringent protocols that were in place along the crew supply chain. While most industries during this pandemic resulted in remote operations [26], most ships and maritime operations across the board could not function without meeting their manning requirements. This includes FPSO's available fuel and energy supply and cargo carriers transporting the needed food, medicines, and consumables.

2.3.2. The concept of crew change operation

The desire to limit face-to-face interactions seen as a conduit to the spread of the pandemic is forcing the alteration of traditional activities of business operations into innovation. How much of this change is seen within crew change operations? It is essential to note that crew change is regarded as one of the most complicated tasks traditionally carried out at offshore sea locations or anchorages and within port facilities – mostly during port calls for ships. This stream of activities is hence performed against the clock to enable ships to continue with normal operations with the required set of crews on time [27]. The process of crew typically occurs when a cargo ship approaches a coastal city to make a port call, contacts a port agency, and makes an official request [27], thus, suggesting that such requests to the port agency are not mostly limited to a change in the crew list. Therefore, crew change is a series of activities that consist of replacing one of the ship's crew members with another one. This action must be previously authorized by the ship's Captain, and it is outsourced to port agencies [27].

A typical modus operandi follows [27]: (i) the receipt of the Captain's request for processing at a fee, (ii) the processing involves managing all the necessary documentation (such as port pass, visas for the disembarking crew), (iii) ensuring the coordination of the embarkation and disembarkation of each corresponding crew member, (iv) where necessary, managing the ferry trips between offshore locations and the port as well as the transfer and

collection of the crewmember from airport to ship boarding locations, and finally, (v) when necessary, booking of hotel accommodation for the crew member returning to their place of origin due to scheduled flight time. Extra services when required are provided under the terms of service.

These durable processes today have come under very difficult constraints [17][28][29], who all bemoaned the COVID-19 situation that had paralyzed supply chains and the movement of people. The IMO [17] insists that seafarers are unsung heroes amidst the pandemic, ensuring the transport of more than 80% of trade by volume, including vital food and medical goods, energy and raw materials, and manufactured goods that were made available across the globe when needed. While it is difficult to fully evaluate the impact of COVID-19 on ship crewing and operations amongst nations over the last couple of months, nations such as India, the UK, Italy, Brazil, South Africa, and others at a point in time rated as COVID-19 hotspots, resulting in extreme internal lockdowns and thus restricting access to foreign travel [30][31][32][33], meant seafarers, marine professionals, and ships in those regions and from those regions came under global scrutiny regardless of the region their voyage commenced. The IMO [17] also claims that an estimated number of 200,000 seafarers remain onboard commercial vessels and are unable to be repatriated past the expiry of their contracts as of March 2021. Thus, averting the ongoing problem remains vital for preventing fatigue and protecting seafarers' health, safety, and well-being.

Further alluded to the difficulties “surrounding repatriation and crew changes” having had a major negative impact on the shipping industry, which resulted in various calls for immediate interventions [17]. Such interventions included the various IMO resolutions that called on “Governments to designate seafarers as key workers” as adopted by IMO, the United Nations General Assembly and the ILO recounts that there have been situations where seafarers are denied access to medical care ashore despite the urgency of treatment needed that was unrelated to COVID-19. This raises further concerns for seafarers, the owner, and ship and crew management teams. With the availability and inoculation of COVID-19 vaccines currently ongoing, it remains unclear whether seafarers are accorded the needed attention and care sort by their crew management teams from the various national authorities. Zeymarine [34] and Wilhelm-Sen [35] reported the current threat to the shipping industry as the slow vaccination of seafarers while citing an incident of ship docking with COVID-19-infected Filipino crew during a period in which the Philippines, India, and many other countries struggled with vaccine shortages. Belgium is the first country within the European Union to commence a program providing COVID-19 vaccinations for seafarers. The International Transport Federation, ITF affirmed efforts by the Dutch government partnered with ship owners and local unions in vaccinating 49,000 seafarers. Additionally, efforts are continuing at major ports around the United States [35]. According to Wilhem-Sen [36], developing countries will not achieve mass immunization until 2024—having approximately 90% of the population within 67 low-income countries. The situation places a burden on 900,000 individuals from developing countries who constitute the world's seafaring community [35].

This notwithstanding, it is essential to note in summary that crew management services are an essential part of maritime and ship management-focused in ensuring there is manpower capacity for various activities handled by crew on-board vessels, as well as related administrative issues that shore-based. The efforts are expected to comply with the ISM Code, ISO 9001:2014, and ISO 14001:2014 standards. The Det Norske Veritas group [37] also notes that crew management today makes use of technology. Thus, ship crew management software is currently designed to support the crewing process across the entire

marine crewing pool while enabling the optimization of vessel crew deployment. Thus, they have access to relevant data and reports accessible onboard and onshore. This development certainly has played a critical role amid the pandemic.

2.4. Marine operations and the routing duties of a ship's crew

Given that the impact of COVID-19 over the past year has been felt in all sectors of the world economy, almost at all workplaces and on nearly all forms of operations, including maritime operations, identifying some of these critical operations carried out by seafarers bares a potential interface to COVID-19. Traditionally, the marine operation responsibilities of a ship's crew are summarized under general maintenance operations, machinery maintenance, and cargo handling operations nearshore and in offshore locations [39].

Ship-shore transfer cargo operations: over the years, significant advancements have been made in terms of technological support, from manual handling, running derricks, and rigging gears to the use of cranes. This includes auxiliary and main cranes and grabbers for lifting various loads and cargo, such as grains, cement, clinker, cocoa beans, and bauxite. It is also commonplace to find a group of men working together to develop the needed force to lift an object far heavier than a single man-load [39] (thus manual handling occurs both in port and offshore locations). Shipside labor provided by dock labor companies [40] is a common sight in most African ports, assisting in the discharge and loading of various forms of cargo. Their presence and activities are mostly associated with the duties of supercargo within loading or discharge ports. It is essential to note that cargo handling aboard ships for sea passage depends on the cargo type and the general exigencies of the transportation, such as perishable goods carried in refrigerated containers or freezer vessels. For freezer containers, an external adequate electric power supply arrangement must be made to freeze the goods [39].

In the offshore energy industry, however, the number of personnel at the level of maintenance and marine operations varies significantly depending on installed pieces of machinery operational both on deck and in engine room spaces [20]. Rhetorically, to what extent are shipboard operations varied with the onset of the pandemic?

2.5. Current developments in COVID-19 regulations and policies

AD Sackey et al [2]note the rise in national and international restrictive regulations and policies worldwide guided by the WHO's mandated guidelines [41] to curtail the spread of the COVID-19 virus. The regulations, although varied in the extent of implementation and timelines across the world, can be grouped into (a) movement or travel restrictions (restricting the movement of persons from place to place), and (b) public order mandates (including a need for social distancing, behavioral mandates on personal hygiene and order restriction such as the ban on mass social gatherings, and social businesses) [2].

Within the maritime sector, several resolutions were passed to be enforced by member states of the IMO. These resolutions focused primarily on vessel crew and maritime professionals by highlighting the concern of (i) according to them "essential status" privileges in the performance of duty. Thus, under the IMO Circular Letter No. 4204/Add. 6 and IMO Circular Letter No. 4204/Add.18, also known as the "Key Worker" status call (measures to facilitate ship crew changes in seaports during the coronavirus (COVID-19) pandemic), (ii) addressing the crew change crises under IMO Circular letter No. 4204/Add. 14, IMO Briefing 15, and port state control (framework of protocols for ensuring safe ship crew changes and travel). Others include resolutions for personal protective equipment (CL.4204/Add.15),

seafarers certificates (CL.4204/Add.19), and ensuring a safe shipboard interface between ship and shore-based personnel (CL.4204/Add.16) [17]. The IMO recognizes the violations of seafarers' rights stipulated under Regulation 2.5 of ILO's Maritime Labour Convention (MLC) –stating "seafarers have a right to be repatriated at the end of their contracts," as they work to end these violations as a result of measure implemented war off covid-19 spread [17]. Presently, these travel restrictions are easing out following the successful production and continuous inoculations of people across the world with the COVID-19 vaccine. Within the maritime sector, these developments are seen as good news, as they may pave the way for much-needed crew changes.

Conversations have continued concerning violations by Flag and coastal states of the ILO MLC 2006 Regulations 2.5, for instance, providing facilitation of repatriation and replacement of seafarers serving on board ships, which suggest could be linked to the current state of ratification of ILO Member States [42]. Thus, unlike the ratification of ILO MLC 2006, the IMO Convention on Facilitation of International Maritime Traffic, 1965 (FAL Convention) is widely ratified. Assertively, some provisions in the latest amendments have called for the recognition of seafarers' identity documents to serve as basic documents providing public authorities with the needed information relating to crew members on arrival or departure of ships. Again, the focus of the instruments related to the Convention seeks a national single window of seafarers' identity documents and their related databases [42].

These efforts are supported legally by the latest ILO Convention No. 185 on Seafarers' Identity Documents (Revised) 2003 and as amended in 2016. This instrument specifically regulates the issuance and harmonization of seafarers' identity documents issued by the national authorities of their national countries. The document succeeds the earlier ILO Convention No. 108 on Seafarers' Identity Documents, 1958 with 35 percent ratification. It is stated that the benefits will exceed the immediate 2 million seafarers working and living aboard international trade ships, who are the potential beneficiaries of these documents that conform to the latest ICAO standards verifiable with the same equipment as an e-Passport. The goal is to "facilitate seafarers' entry and transit to join their ships, their disembarking in ports, and crossing international borders while enhancing security using an internationally recognized document."

However, less than 20 percent of member states have ratified ILO Convention No. 185 with some implementation challenges that predate the pandemic requiring redress [42]. Hence, labor supply, flag, and port states consider becoming parties to the conventions and aid in the implementation of the latest relevant versions pertaining to international legal instruments under the current circumstances [42].

2.6. Notable seafarer experiences from COVID-19 impacts observed across the world

Direct infections early on from the COVID-19 virus, according to the WHO, were the first reported on-board the Grand Princess with over 700 infections and 14 deaths, accounting for over half of reported cases of SARS-CoV-2 outside of mainland China [43]. Subsequently, there have been dozens of reported infection rates from cruise ships to other commercial ships and offshore platforms. This includes several FPSO units and rigs in the offshore oil industry, of which Ghana's FPSO Kwame Nkrumah recorded 60 cases of infections offshore [15][44] and Shell's Nelson rig recorded 14 cases of infection [45]. In addition to media reports suggesting the myriad of problems, the seafarer community, and marine professionals are exposed to –highlighted by AD Sackey et al [2] to include risk to their health, employment, finances and overall social well-being, [45] closely examined the psychological effect on a

cruise ship's crew. They found that aside from the health implications of COVID-19 infections, depression was a profound medical illness among crews, suggesting that seafarers were more susceptible to diverse mental health disorders, including depression [[45][46]. Subsequently related the condition of depression to concerns of poor human resource management strategies lacking contingency planning for managing health and epidemiological type crises, and social isolation on-board [45][47]. The situation was compounded by a pervasive maroon that cruise ship employees suffered at sea for months [45][48] due to the COVID-19 pandemic. With rising case infection globally, the new challenge set forth a series of restrictions that meant maritime businesses, operations, and their customers had no option but to adapt to the changing environment of regulations.

2.7. Notable innovative solutions associated with continuous global marine operation

As discussed in earlier sections, the challenges faced by seafarers and marine professionals amid the pandemic are numerous. Some measures implemented to alleviate some of the problems have been diplomatic, thus the call via various policy resolutions [2][17] on various national authorities to accord special concession on restrictive regulations on seafarers and marine professionals. Other measures have been the provision of technical support to aid seafarers' social interaction against depression. Internet data services were provided to help the industry cope with the strain [2][7]. In the oil and gas industry, accelerated digital technologies such as remote inspections and AI-driven operations adapted to help with coping in the crisis, including the need to adapt to transitional energy markets emerging [2][49].

3. Methodology

3.1 Study design and scope

The study follows a case study approach towards developing an understanding of the current situational conditions of COVID-19 and its related concerns that have subjected African seafarers and maritime professionals on board vessels amid the pandemic. Heavy restrictive regulations continue to remain even as various countries go through different faces of the pandemic while opening up economically. The study plan was carried out in stages as and when access was made available. The study was delimited by access granted to the researchers in the fields shown in [Figure 2].

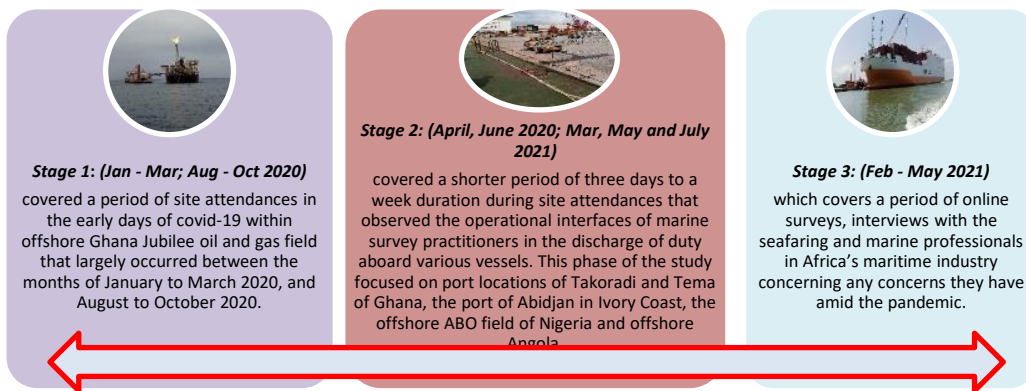


Figure 2: Structure of the study

Maritime operations observed over the period took into account operations offshore and within port facilities limited to the Gulf of Guinea region. The study areas encompassed operations in Ghana's maritime boundary. The other study areas included the Ivory Coast, Nigeria, and Angola maritime boundaries. These national maritime boundaries were selected based on accessibility to researchers and their strong maritime and offshore presence in the West African Sub-region that continued through function amid the pandemic under grave constraints.

Given that the study's concern focused on the raging COVID-19 public health crises, protocols, and restrictions across these countries of interest encompassing travel constraints, hotel protocols, marine facilities, and operations, the study limits its scope to the above-described periods of varying operations. The scope chosen is in sync with the general business trend across the region, as suggested by AD Sackey et al [2]. The approach will primarily be a mixed qualitative and quantitative account per description.

Based on these designed stages, the study proceeds to examine the entire African context soliciting experiences of sampled seafarers and a select group of marine professionals available to the researchers. The study then makes use of a narrative element in describing the observation of operations amid the pandemic during site attendances under study.

The mixed qualitative and quantitative approach implemented in the study allows researchers to be able to gauge the experiences of respondents accurately in comparison to the analysis derived from the statistical data obtained. The correlation from the results we believe shall reveal the sensibilities of emotions given the study's core objective is to help develop an understanding of issues about marine professionals and ship crew wellbeing amidst the pandemic.

3.2. Data gathering and analysis process

The data gathering process followed AD Sackey et al [2] approach—taking into account the overall survey requirement to gauge opinions of seafarers and marine professionals and the various attendances at study sites chosen for the study, which informed us on data needs, analysis and the various sets of data gathering tools researchers could rely on amid the pandemic restrictions. The study also factored in time and access during the gathering process, which considerably impacted the primary data collection process and its sources. The instruments chosen for this research were questionnaires, personal observations, and interviews with experts or 'eyewitness' respondents. Thus, the first and second stages of the study conduct site observations at various stages of the pandemic cycle between 2020 and 2021.

The third stage focused on online surveys and interviews in the first quarter of 2021. A review of secondary data is also carried out. The instruments chosen for the online survey (Google Forms and LinkedIn survey) were deployed through various platforms, such as mobile phone calls, including online text platforms that use WhatsApp, Facebook Messenger, and emails. Various literature materials from online articles, journals and webpages, and news were also cited. These approaches were imperative due to COVID-19 health risks, protocols, and regulations, including various social distance requirements, travel restrictions, and heightened health risks following the varying new strains. Direct and indirect interviews were conducted (see Appendix).

3.2.1. Sample size

The samples chosen for this study are a fraction of the seafaring community and marine professionals who work in the maritime and offshore industries across Africa. These are with varying degrees of experience. Sample size (1) constituted ten (10) purposively selected expert respondents engaged in interview sessions (see Table 1). [Table 1] below is a list of crucial experts interviewed.

Table 1: Sample size (1) — selected interview respondent

Marine Surveyors	24-10-2020	MWS Survey practice and situational awareness
HSE & Deck Crew	(15-19)-02-2020	Operations safety and situational awareness
Safety Officer	(15-18)-06-2020	Health and safety concerns
Ship Agent/Ivory Coast	23-03-2021	Ship Management concerns
Crew management	11-02-2020	Crew (dis) embarkation
Pipeline Pressure Test Engineer	15-07-2021	Survey concerns
Chief officer and Master	10-10-2020	Club Survey
Statutory Surveyor	20-10-2020	Statutory
Crew operation Manager	16-09-2020	Crew management & Quarantine
Marine Cargo Surveyor	18-10-2020	Cargo

Source: Field Data

Sample size (2) shown in [Table 2] constitutes the random sampling of 100 seafarers and offshore marine professionals of various nationalities whose experience aboard ships encompasses time spent on traditional ocean-going ships and offshore specialized vessels. However, 71 individuals were able to respond to surveys per time constraint. The two samples selected from the population of seafaring and marine professionals were empirical to project a clearer understanding of sentiments among these populations in the areas of interest and ascertain if there was any convergence between experiences of senior rank members (largely constituting sample (1) shown in Table 1) and none senior members of the population.

Table 2: Respondents to survey questionnaires

Population	Sample Size	Actual Respondent
Seafarers and Offshore marine professionals	100	71

Source: Field Data

The data analysis carried out from the study, which was mostly qualitative with slight quantitative data, followed a descriptive narrative as it deployed comparative arguments in developing the knowledge based on the information obtained. Survey analysis involved graphic presentations that made use of point scores and percentages.

The entire analysis architecture shown in [Figure 3] is a slight modification of the [2][50][51] structure as it cooperates with the global health challenges and the dynamic geopolitical climate of restrictions shaping the West African maritime corridor.

4. Results

The results herein discuss the various field observations and experiences of researchers engaged in varying operations situated within the maritime boundaries of four influential

West African nations—juxtaposed to experiences of the selected experts interviewed along with the general sentiments among the seafaring and marine professionals gathered through the survey. The discussions are detailed below.

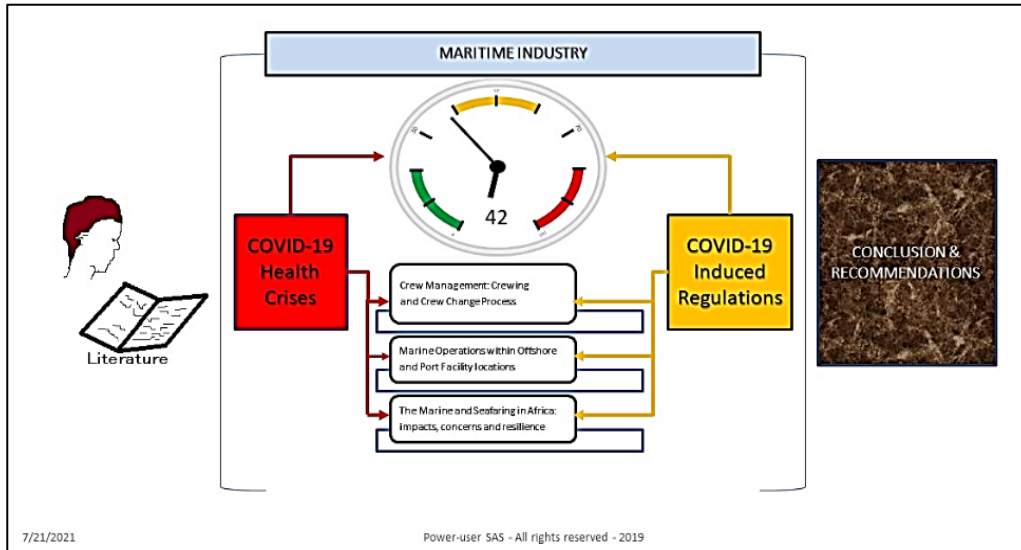


Figure 3: Analysis flow

4.1. Background of respondents

Background of respondents from Tables 1 & 2 above transcended most of the popular career groups found within the maritime and offshore domain, which included the number and experience of Roustabouts, Able-bodied seamen, deck and engine officers, welders, offshore Riggers, Subsea Project Engineers, Ship Agent, Crew Agents, HSE officers and Deck foreman (as seen in Fig 4 in terms of point score and averages for each in percentiles). Others included marine surveyors, deck technician engineers, and subsea pressure test technicians.

The sum of experiences of the expert respondent amounted to 141 years, with an average of 14 years, from which four seasoned mariners accounted for 61 percent of the experience. Thus, 87 years of 141 years total.

These were in senior and middle management of operations whose work scope influenced other marine professionals. Respondents, however, engaged in the survey constituted individuals of all demographic with occupational experience of over 306 years –working on various roles on vessels. Together, the working experience of respondents in the industry amounts to 446 years –translating to 449 points (see Figure 4), which is significant to drive the perspective of the novel concerns resulting from COVID-19. With this background, researchers sort to ascertain the level of situational awareness from the pandemic.

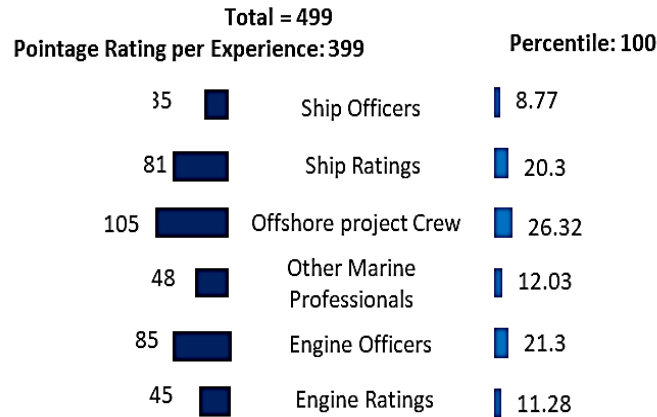


Figure 4: Ranks paired against marine experience and occupation in evaluating the responses of respondents

4.2. Covid-19 situational awareness by respondent

Researchers could not identify anyone out of the respondents who were not aware of the current status of the global pandemic. When asked specifically if they were aware of the developments of the COVID-19 virus, the symptoms, the protocols in place at the worksite, if they were ever willing to help end the spread if they were aware of vaccine development, and if they were willing to receive vaccine inoculation. The general response showed high levels of awareness of the COVID-19 health crisis [2], as some were observant of the information regarding the progressive changes in viral variants of SARS-CoV-2 since originating from China, which includes the UK, the Brazilian variant, and the current Delta variant from South Africa. Others referred to the first and second waves of the spread of infection as the most sensitive moments that characterized their careers as businesses were forced to close, leading to contract cancellation, suspension, and forfeiture. Concerning symptoms, each respondent had no struggle recollecting one or two out of the catalog of symptoms to look out for when scanning their immediate environment, which was consistent with the WHO's symptom list [7].

Respondents had no issue recollecting the very immediate COVID-19 protocols – before embarkation, on their Jobsite, and during disembarkation – and the essence to ensure strict adherence at all times. However, a handful indicated discomfort on most occasions when complying with all these protocols, suggesting their interest in securing an alternative. These findings agree with AD Sackey et al [2] findings. Again, all respondents showed great awareness of vaccine development (citing vaccines from Pfizer, COVAS, JOHNSON&JOHNSON, and ASTRA) and rising inoculations across the world. Essentially, those who consented willingly to receive vaccine inoculation if offered constituted only one-third (33 percent) of the total population of 81. Two-thirds (66.67%) of the respondents indicated that they would accept the COVID-19 vaccine when it was made a job mandate. The high prevalence of resistance occurred before the first vaccine was announced. The study, however, observes a growing interest as public education continues in Africa.

4.3. Nature of marine operations impacted by Covid-19

Regardless of the COVID-19 pandemic crisis and restrictions, marine vessels continued to move from port or offshore facilities to ports and vice versa in the region, whereas operations

of all forms on offshore sites and port locations continued. Respondents were then asked what had been the impact of the pandemic on operations. Respondents were quick to point out that the situation has had a great impact on their work during operations since March 2020. Some noted several incidences of time out called amid operations to brief the crew concerning the reported rumor of covid-19 situation that created much anxiety and agitations among some crew members offshore Ghana. The foundation of the problem was a crew change that occurred right within the early stages of border closure and travel restrictions in Ghana following the first imported case into the country from Europe.

Researchers observed that this "timeout" call effort helped coil a volatile situation on-board one pipeline and a heavy-lift construction vessel of over 300 crews (thus foreign and local) over the period, as all crews were officially informed in a general meeting of the negative test of the suspected case, although the individual was made to remain in isolation after boarding the vessel. Therefore, respondents attributed the volatile nature of events inflating passions and anger among some crewmembers to the level of anxiety, uncertainty, and lack of relatable information in the early days of the pandemic. According to some respondents, these events impacted the morality of the crew. Their desire to see things return to normal was visible throughout their comments and discussions, affirming a general feeling amongst the various segments of marine professionals [2].

4.4. The Covid-19 health risk concerns seafarers and marine professionals

As P. T. Alpert et al [46] illustrated in their study, the health crises currently experienced by seafarers as a result of the COVID-19 pandemic are not limited to COVID-19 virus infection and the associated symptoms. However, the COVID-19 health crisis unconsciously elicited strains of other health crises (mostly psychological) within the social cycle of both affected and unaffected individuals. Thus, the growing concerns over poor mental health today are unavoidable per research studies and media reports –had resulted in suicidal tendencies, while others are withdrawn due to stigmatization.

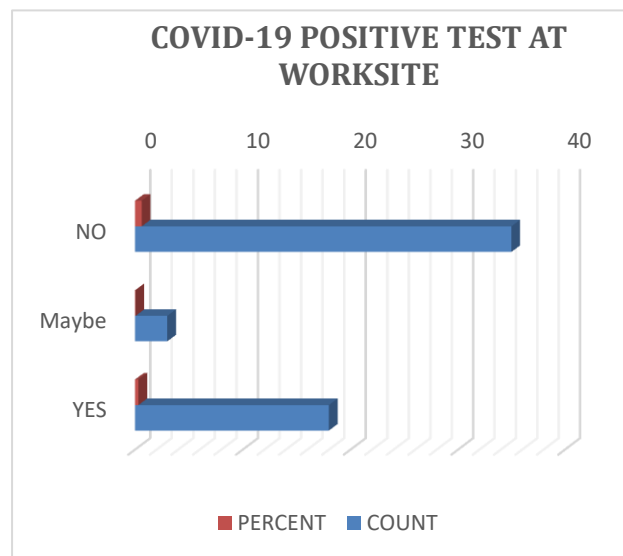


Figure 5: Respondent who responded to whether anyone on the worksite ever tested Covid-19 positive

These conditions of poor mental health were also observed by Alpert et al [46] among the onboard crew of a cruise ship. Notwithstanding the sensitive nature of the issue, respondents were asked if anyone at their worksite had ever tested positive for COVID-19. Of the 71 respondents, 18.36 percent offered to respond –well aware of the stigma surrounding COVID-19 despite the myriads of available public information and education across the world. Researchers intentionally weighed their responses against the condition that those responding were on active duty onboard ships at the time or had only recently disembarked from their ships. For those who responded regardless of privacy concerns, the results are shown in Fig 5. 17.50% answered in the affirmative. The respondents explained that as time has weighed in on the COVID-19 pandemic, much has been learned, and therefore, a positive case is not as feared as before even of the rumor by ship crew. Some were happy to share their earlier experiences with researchers –claiming there were occasions remorse on-board led to agitation among some crew members when after a crew change earlier that day, an on-signer happen to have been seen displaying symptoms similar to covid-19. According to them, although the individual was subsequently quarantined, most crew members took offense and questioned the vessel management of reasons for the crew change amid the pandemic. A total of 34.20% indicated no query of incidence at their job worksite, whether during port calls or on travel. A little over 5 percent. However, 2% were unsure, claiming that during embarkation quarantine, the crew was kept across various hotel facilities, and whenever the test was conducted, they were hardly disclosed openly. Therefore, they could not tell which of the crew was affected at any time despite the rumors.

Beyond the work site, all respondents were asked if they personally or any close associate had to come into proximity to the positive COVID-19 test. Of those responses indicated in the chart of Fig 6, it can be seen that of the 19 percent who responded to the query out of the 71 respondents sampled, 69 percent said no, they have never tested positive nor have any close relations of their tested positive for the COVID-19 virus. 31 percent, however, indicated the affirmative. Those who indicated the affirmative did not wish to explain the circumstances as according to them brought bad memories. They, however, shared with researchers that the situation led to delays in the embarkation of vessels, as well as having to also suffer from a state of depression. Others indicated they lost their job offers entirely without any form of compensation. Some suggest that the most difficult part is the moment such news is broken to them concerning the laboratory test when they had patiently endured quarantine and were only a few days away from mobilization. Given these comments, researchers proceeded to examine crew management operations over the time frame as discussed below.

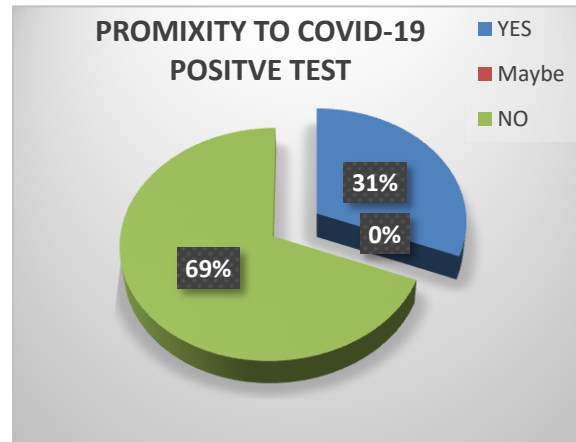


Figure 6: Respondent response if they or any close associate have had a positive covid-19 test

4.5. COVID-19 protocols, Regulations, and policies influencing crew management operations

Respondents were subsequently asked whether they had noticed any massive changes in crew management operations since the operationalization of national and international COVID-19 protocols and did they find them useful and a healthy balance of their work and health. According to respondents, there was no doubt the measures were tough on any free-born individual in the world who has been forced to cope with this crisis. This thus concurs with [2]findings [2]. As observed, none of the respondents were excited about the excessive restrictions and protocols. They were also neither in favor of allowing the pandemic to spread for the sake of keeping their freedoms. They indicated that the normal situation of a relatively basic arrangement for premobilization, mobilization, post-mobilization, and disembarkation operations across the entire chain of crew management under shipping and offshore operations changed.

4.5.1. Travel protocols against routes of travel and challenges arising

Several COVID-19 travel protocols have been actively in place across the world since the onset of the pandemic [12][30][31]. These protocols in practice are carried out at various interfaces that travelers and migrants patronize. These facilities include seaports, airports, hotels, road transport arrangements, and restaurants. Seafaring and marine professionals who have had the reason to travel to their various workstations onboard ships offshore and at port facilities. Most have had varied experiences concerning the implementation of travel restrictive protocols. Thus, the study observed that a typical seafarer's job required him or her to travel from the home country, state, or region to board the vessel for which the job employment contract was signed. Such operations entail securing a boarding pass if vessels are in a port location. Depending on the proximity of the seafarer or marine professional's home to the vessel location, flight tickets are secured for their travel together with a visa where necessary. Largely, travel protocols affecting their movement are those implemented at air and seaport facilities. These protocols can be categorized into:

- (a) Airport or Seaport protocols specified by State Authority per national regulations— all travelers are required to present a negative COVID-19 test case under 72 hrs

before receiving a boarding pass for flight or vessels while ensuring adherence to all social protocols in public spaces.

- (b) Flight Protocols per Airline requirements— all travelers are required to ensure adherence to social and personal hygiene protocols for COVID-19 all through the flight until disembarkations.

It is imperative to note here that most of these protocols form part of the crew management guidelines handed over to ship crew and marine professionals attending to or leaving worksites. These instructions are regularly updated as per regular travel advice received during shipboard operations. Regardless of compliance with the protocols and all efforts made by ship owners, seafarers have continued to suffer from overstayed contracts onboard ships partly due to concerns about the unavailability of flights at the end of mandatory quarantine stays.

It is also essential to note that ship crews have occasionally disembarked ahead of contractual terms due to emergencies. However, the COVID-19 pandemic took this option away from most ship crews in the past year. A case in point is the recount of one of the most difficult situations observed by researchers while on board. The case involved an elderly ship crew in his late 50s who received news of the passing of his aged father. This crew member is the breadwinner of his family. The vessel's construction management team offered the crew member sometimes off away from construction operations on the offshore oil and gas field. However, the crew did not find the gesture useful and returned to the worksite –taking up lighter jobs on the vessel's main deck (housing various heavy-lift cranes, pipeline production plants, and pipe storage unit), and only resorting to intermittent phone calls and browsing when away from construction area (in the vessel's accommodation unit) as much as possible to communicate with family members back home. All crews were empathetic to his inability to demobilize and head home to Malaysia offshore Ghana. This case is similar to that of another crew member on board the Seven Borealis who had to resort to calls and video chats on WhatsApp to be part of the burial of his mother. Flight as a means of travel in Africa continues to be one of the most underserved commerce; therefore, availability and pricing are never guaranteed.

Again, seven crew members of the general bulk carrier during loading in the port of Abidjan, according to expert respondents who indicated they were scheduled for crew change upon berthing, were forced to remain on board and to continue their service until the vessel had concluded the next voyage to Malaysia after crew management was unsuccessful in securing a flight from Abidjan to the Philippines. The respondent who also doubled as a captain indicated that their relievers in this case were also forced to continue to stay back in quarantine or return home until crew change was possible – raising issues of inconvenience and low morale amongst crew members. The respondent also noted the unavailability of the berth at the most critical point in time during the port call as another reason they had to grapple with. He passively added that crew change operations onboard ships cannot simply be compared to most land-based operations where systems can simply be shut down where necessary until the next hand takes over. With ships, there must be a man on watch at all times literally, he stated, and therefore until your reliever shows up on the ship all crew is expected to keep their duty post.

- (c) Land Border routes and protocol – the use of land border crossing in migration amongst Africans appears and continues to be the most effective migration channel, especially in West Africa. Across the study regions, researchers observed that international borders between neighboring countries have remained closed since

March 2020, whereas internal borders between cities, regions, and counties remain open. COVID-19 protocols for commuters were largely limited to social distances and mandated personal hygiene before crossing each police, drug enforcement, customs, or immigration barrier. There are no PCR (polymerase chain reaction) COVID test requirements for migrants who continue to cross the land borders.

Since most land borders in Africa remain closed despite improvements in managing the COVID-19 pandemic across the world, border communities and migrants, in general, have questioned the wisdom behind the delay in opening and, in some instances, staged demonstrations as reported in the Ghanaian media of Afloa border next to Togo and the Elubo border next to the Ivory Coast [52][53][54]. The reasons for these continuous border closures remain unclear regardless of the frustrations among residents living along the border. Marine professionals such as Surveyors, Auditors, and Seafarers who have had to attend to job sites in locations near or in neighboring countries, regions, or towns with less or no available flight arrangements continue to use these land borders, which remain close to most West African nations, as observed; hence, such migrants resort to the use of unofficial routes at their peril. These unofficial routes include river bodies for which the use of canoes continues to serve border communities and migrants as a whole, although there are no strict COVID-19 protocols for commuters. Respondents who made use of these land border crossings in the course of performing their duties indicated their disappointment with how special consideration is not given to them when attempting to cross the border as 'key workers, ensuring that the asset integrity of vessels ensures the safety of life at sea of all crew and property. Rather, they are turned back, and they have had to resort to unapproved border crossing routes. They also indicated occasions where they witness diplomatic vehicles being let through the approved borders in their diplomatic vehicles. To them, the voice of IMOs and major stakeholders through the resolution did not resonate in the boundaries of their member states, as border security personnel were unaware or adamant of the protocol via the December 01 2020 resolution.

Given that December 01, 2020, UN IMO resolution categorizes seafarers and marine professionals as 'key workers' to aid their movement between their job sites (ships and ports) and their native homes, it is naturally expected that such individuals wielding identity cards and complying with the protocol are given access to freely pass across any national border—be it land, sea or air space provided they have the required documentary evidence. However, no effort has been made to sensitive the land border security of these changes, and are therefore subject to security risk and extortions at border crossings. Notwithstanding, the concerns of extortions at border posts are not new, and it is imperative to note that COVID-19-related travel costs and restrictions [55] have only worsened the plight of travelers' insecurities and extortions at the various borders.

4.5.2. Quarantine requirement for seafarers

a) The Ghanaian Scenario as Observed:

The 14-day quarantine requirement for COVID-19 is continually being implemented worldwide. In Ghana, while a 10- to 14-day quarantine was strictly required of ex-pat professionals entering the country and attending to offshore operations, due to the need for cost-cutting measures, the quarantine period for designated local crews during embarkation was split into two periods. The first three to six days are periods of self-isolation at home. During the self-isolation period, the Health and Safety officer of the crew management institution conducted unannounced video calls to determine the levels of adherence to the

requirement. An eight-day quarantine then proceeds embarkation for which a COVID-19 test is carried out 72 hrs ahead. A daily record of the temperature of each person in isolation within the hotel is taken by quarantine officers for the operators. These quarantine protocols observed in Ghana were largely similar and varied slightly to those observed in Angola. As observed by researchers on offshore site observation, the following itemized events characterize the COVID-19 protocol of both foreign and local nationals whose professional duties place them onboard ships at remote locations.

b) The Angolan Scenario as Observed:

In self-isolation, a daily log of your temperature and blood pressure will be taken by a dedicated doctor/nurse. For foreigners, in addition to the mandatory PCR test required at the various airport units from the place of departure and place of arrival, the quarantine PCR test is also needed.

Thus, these records plus another negative test certificate to be issued are required by the Ministry of Health and Shipping Agents on the day of transfer embarkation aboard the surfer boat designated to conduct the transfer of the crew from the shore facility to the remote offshore platform or vessel.

Again, once on-board the designated vessel or FPSO unit at the offshore location, the following rules apply:

1. Clothes are isolated 72 hrs before sending to the laundry.
2. The onboard medic takes a daily log of all POBs.
3. A rapid PCR Covid-19 test is done on day 8.
4. All items from transfer boats, etc. are quarantined for 24 hrs before any person is allowed to physically handle/touch them.
5. The usual hand washing is encouraged, and hand gels are made available at each door to encourage sanitization.

It is also observed that work rotations are now 6-8 weeks aside from the quarantine days; hence, a total of 10 weeks per trip is completed by each crew regardless. Once the crew disembarks and arrives onshore, a COVID-19 PCR test is again required over the next 72 before flight departure for any foreign crew.

Again, depending on the government rules and policies concerning an ex-pat staff's region of dwelling, he or she may be required to undergo a mandatory 10-day quarantine. In this case, a negative COVID-19 test result is required on both day 2 and day 8 of the quarantine period. As a result of these measures, a maximum of 12-14 weeks has become the current length of days marine offshore personnel endures over a 12 hr daily shift away from home.

Similarly, in the Ivory Coast and Liberia, PRC test results were demanded of any crew by the government and ship owners before entry into the seaport and subsequent embarkation. These measures appeared to have been effectively implemented in certain sections of the seaport in Abidjan. However, this was not the case at the remote seaport of Greneville in Liberia dedicated to bulk carriers transporting timber logs or lumber products.

4.5.3. Boarding and disembarkation arrangements

Personnel transfer between remote offshore facilities and land-based facilities continues to make use of choppers, supply boats, and surfer boats. In offshore Ghana, chopper transfer appeared to be the dominant of the 3 modes of personnel transfer within the cape's three western basins for the 3 FPSO units. In Angola, the surfer appears to be the most dominant means of personnel transfer. However, during subsea construction operations, premobilization

embarkations in Ghana were largely carried out at the seaport where the construction vessels made use of the bulk carrier berthing in Takoradi port. This allowed for large sets of crew sizes, such as 300, in a single embarkation operation. These operations are carried out with COVID-19 protocols implemented in the port area of embarkation. Crews are required to comply with COVID-19 at all times while they are on the wharf awaiting boarding via the gangway. Researchers did not cite any data on any COVID-19-positive cases during such operations in the port.

According to respondents, despite the current requirement of a negative PCR test required to embark on marine vessels within offshore Ghana, in recent times, priority has been given to crew members with COVID-19 vaccination inoculations. These have caused some level of uncertainty amongst some local seafarers who before the new guidelines have signed contracts and were on standby—awaiting embarkation. The news leading to forfeiture of their embarkation and subsequently their contracts clearly illustrates the continuous economic hardships COVID-19 protocols have on individuals. It is worth noting here that seafarers within Africa throughout this COVID-19 era have received no financial relief and therefore mostly have had to rely on family for support, as most indicated by their long stay at home.

4.6. Other concerns raised by marine professionals and seafarers

Respondents when asked if there were other concerns they had to face over the period, all indicated the affirmative, claiming the majority of them over the course of one and half years have suffered indiscriminate cancellation of contracts besides the challenge of having to undertake overstayed contracts at some point in time. Others lamented their concern of unpaid and reduced wages at short notice in violation of ILO MLC 2006 with the only reason given – being the cost-cutting measure on crew wages to support the excess cost of operations and to keep them at work. This is a sharp contrast to the incentives given to other 'key worker' groups, such as nurses and doctors, during this fight against the COVID-19 pandemic. Respondents believe leaders in the maritime industry need to do more than talk at various talking shows and conferences and demand real action from nations signatories to UN and IMO conventions. Some also suggested that legal violations were not only on the economic front but also extended to human rights [56] and health concerns.

They bemoaned the fact that this single event tended to let seafarers rethink their careers and opt for other professions. To them, once a noble profession now appears less valued in society except when they dress up in their uniforms and appear at functions.

5. Summary, conclusion, and recommendations

5.1. Summary

The study found that all respondents demonstrated a high level of awareness of the protocols and health risks they faced during site attendance. Marine vessels, offshore installations, and shore-side facilities have also been at the forefront [57] of the COVID-19 fight, providing the essential energy commodity to power innovation, healthcare, and economic sustenance. The challenges experienced due to the spread of coronavirus are identified in an earlier section and classified into (a) the risk to health crises as the spread continues with no advance cure insight and (b) the restrictive regulations crises forcing socioeconomic activities to shrink world over. The impact of the COVID-19 health and regulation crises, as mentioned above, has led to economic fallouts in terms of loss of business, high cost of doing business, and the massive rush for innovative ways of staying in

business. The sum of the working experiences of respondents engaged in the industry amounts to 446 years, which is significant to drive the perspective of the novel concerns resulting from COVID-19. With this background, researchers sort to ascertain the level of situational awareness from the pandemic. The general response showed high levels of awareness of the COVID-19 health crisis [2], as some were observant of the information regarding the progressive changes in viral variants of SARS-CoV-2 since originating from China, which includes the UK, the Brazilian variant, and the current Delta variant from South Africa [57][58].

Marine vessels have continued to move from port or offshore facilities to ports and vice versa in the region, whereas operations of all forms at offshore sites and port locations have also continued amidst the pandemic. COVID-19 health crises have unconsciously elicited strains of other health crises (mostly psychological) within the social cycle of both affected and unaffected individuals. Respondents indicated that the normal situation of a relatively basic arrangement for premobilization, mobilization, post-mobilization, and disembarkation operations across the entire chain of crew management under shipping and offshore operations changed as a result of restrictive COVID-19 protocols. Respondents who constituted people mostly from Africa and Asia have suffered indiscriminate cancellation of contracts in addition to the challenge of undertaking overstayed contracts at some point in time. Others lamented their concern about unpaid and reduced wages at short notice in violation of ILO MLC 2006.

Situational awareness of COVID-19 and related matters, therefore, remains high amongst marine professionals. Again, although institutional quarantine and protocols are perceived to be generally effective, COVID-19-positive cases recorded on-board various offshore vessels upon embarkation after mandated quarantines tend to suggest that there is no 100% guarantee of effectiveness in the current measures implemented. This has therefore necessitated mandatory vaccine inoculations for remote offshore oil and gas marine crews within certain countries, such as Angola and Ghana. It is essential to note that international efforts are still ongoing in attempting to address the concerns of seafarers and marine professionals.

Despite the many pledges by IMO member states across the world, real efforts are yet to be seen that address the concerns of seafarers if the designation 'Key Worker status will ever have a meaning and inspire rather than demotivate members of the profession who have continued to ensure there is an adequate supply of energy, food, medicines and consumable across the entire planet –helping avert a global catastrophe. The legal violation of the MLC 2006 that continues until today ought not to be ignored if seafarers are ever going to have confidence in stakeholder institutions regulating their operations.

While institutions such as the ITF continue to fight on behalf of seafarers, their efforts appear too little and too late after the harm is done. There is a need to have deterrent measures instituted against such violations going forward. Port state control inspections (PSCs) and flag state inspections remain relevant in detaining recalcitrant ships in violation of ISM, ISPS, and MLC 2006. Management and owners are directly not held responsible and are left off the hook. All concerned need to note that seafarers are parallel-militarily trained and therefore at best have endured this hardship and violation faced of their rights without fringing. However, how long will policymakers continue to pay lip services without providing tangible results?

5.2. Conclusion and recommendation

The study concludes by asserting that the current COVID-19 crisis, regardless of whether it lasts over a year and the progress made in vaccine production and therapy, continues to pose a challenge to seafarers and marine professionals. Thus, the rate of spread of the COVID-19 infection on-board cruise vessels, among others, suggests that there are still questions as to what extent the SOLAS convention factors in guidelines into ship design and operations that ensure highly contagious communicable diseases such as the coronavirus are properly catered in ventilation systems. Although the studies identify numerous constraints in various regulations, international guidelines and best practices, violations of working agreements and occupational health requirements, and various noticeable interventions, including *Key Worker* status, when properly implemented do have positive implications for the well-being of marine professionals and seafarers, due to several limitations, the study could not fully evaluate all concerns. Therefore, further research is recommended to evaluate each of the scope concerns.

Again, the ad hoc approach of learning and developing measures in reaction to aid maritime operations by the IMO, although it managed to sustain the global supply chain through the COVID-19 pandemic, resulted in a major crisis for men and women at sea. Therefore, lessons learned within this period of history should inform the need for a comprehensively developed global emergency contingency regulatory plan that identifies various potential threats, establishes adequate measures, and adjusts reviews and amendments. Such a contingency regulatory plan will be expected to activate under the UN conference with the aid of the IMO and other stakeholder organizations and nations. A decentralized form of the plan is expected to be adopted by all UN member states, as it will harmonize decision-making and measures implemented. Such documents ought to be made public for easy assimilation.

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