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Senior managers and safety leadership role in offshore oil and gas construction projectsTarila Zuofa^{a*}, Edward G. Ocheing^b*^aSchool of Mechanical, Aerospace and Automotive Engineering, Coventry University, Coventry, United Kingdom, CV1 2JH**^bCranfield School of Management, Cranfield University, Cranfield, United Kingdom, MK43 0AL*

Abstract

Recent changes in the global construction industry coupled with rising challenges as a result of the dynamic nature of offshore operations have greatly underscored the need for stakeholders to evolve safety management systems that optimize safety during the execution of their construction project operations. As a result, the offshore industry has witnessed significant changes which currently place a greater premium on effective safety management, with organizations' requiring to look across the whole project's life cycle. To optimize safety during operations, formulating effective safety management systems becomes a crucial challenge faced by industry stakeholders. Utilising evidence from semi-structured interviews, this paper examines senior managers' role in safety leadership in Nigerian offshore oil and gas projects. It concluded that leadership style is critical for the implementation of any effective safety management system utilised during offshore construction projects. The findings also facilitate an in-depth understanding of lessons learnt from offshore construction projects and will be useful for improving the overall safety management strategy of organisations in line with important factors usually considered by the global offshore oil and gas industry.

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1. Introduction

Majority of the oil and gas resources are domiciled in offshore fields. Past studies [1] indicate that there are over 7270 offshore oil and gas installations in place globally with a distribution in more than fifty-three countries. Offshore hydrocarbon resources also serve as a major source for meeting the global energy demand. According to Maribus (2014), offshore projects have produced about 30 per cent of the world's oil production and 27 per cent of world gas production since the start of the new millennium. [3] equally added that above ninety per cent of the world's undiscovered hydrocarbon reserves lie offshore and further disclosed that proven offshore oil and gas reserves in excess of fourteen billion tonnes of oil equivalent accounts for only about five per cent of the total proven oil and gas reserve estimates. Additionally, The International Energy Administration (IEA) anticipated that global offshore oil and gas fields would account for about a third of the anticipated one hundred and twenty million barrels per day consumption rate by 2030 [4].

These disclosures buttress this paper's view that the offshore oil and gas sector is unarguable one of the world's most viable sectors since revenue from its investment have prospects of generating huge revenue annually.

Excerpts from [5] revealed that leading global producers of oil and gas include US, Canada, Norway, United Kingdom, Venezuela, Qatar, Nigeria, Kuwait and Saudi Arabia. For the purpose of this research and because of its uniqueness in the global oil and gas industry, the activities of the Nigerian offshore oil and gas industry shall be the primary focus. Statistical projections from [6] confirmed Nigeria's great potential for highly profitable offshore oil and gas exploration and production activities. [6] indicated that with the quest to explore newer frontiers, current focus of exploration activities in the Nigerian oil and gas industry has gradually shifted to deep and ultra-deep offshore fields where huge deposits of energy resources are in abundant supply. Consequently, [7] concluded that the deep offshore operations are sine qua non to the future of the Nigerian oil and gas industry.

Regardless of the importance of the offshore industry to the global economic and that of Nigeria, [8], observed that offshore oil and gas projects are always saddled with higher levels of risks and uncertainties. Their arguments are hinged on the nature of these projects which are characterised by having extreme locations, harsh environment conditions and large number of participants from diverse orientations etc. Furthermore, the offshore oil and gas industry also presents a typical example of safety critical sector because of the interplay of inherent technological, environmental and human challenges. All these highlight the need for all stakeholders in the offshore oil and gas industry to effectively manage projects. One strategy of seamlessly actualising effective project management in a safety critical sector will certainly be by ensuring that adequate safety regulations are adhered to during projects operations.

In managing offshore oil and gas projects, the role of senior managers and safety leadership can never be over emphasised. It has been often argued that effective safety leadership can decrease human errors and incident rate. In support of this notion, The United States Occupational Safety and Health Administration (OSHA) (1996) recognized the power of leadership and identified management leadership as a key element in safety issues. According to [10], Safety leadership that motivates team members to work harder, efficiently, and take ownership of responsibilities for safety performance should upheld. Furthermore, Health and Safety Executive (HSE) in UK articulated that without effective leadership, good safety performance cannot be achieved. From the foregoing, broad conclusions indicating that safety leadership supports increased organizational safety effectiveness can be drawn. Therefore, developing and sustaining safety leadership is important to reduce accidents and to promote safety among personnel. Accordingly, this paper posits that the way forward for safety in offshore oil and gas project operations must be instigated by senior managers' and safety leadership. This is because their actions usually introduce rippled effects on the entire organisation and can galvanise greater levels of safety awareness within organisations.

In the light of the above, this paper will examine senior managers' perceptions of safety leadership and their role towards facilitating safety performance in Nigerian offshore oil and gas projects. The subsequent sections of this paper are organised to provide an overview of relevant literature, introduce the research method utilised, present and discuss the findings and draw up conclusions.

2. Leadership and Safety

As observed by [11] leadership in organisational literature has been mainly approached in a context-free way. The concept of leadership can actually be traced to antiquity however, from a project management perspective, [11] defined leadership as a presence and a process carried out within an organizational role that assumes responsibility for the needs and rights of those who decide to follow the leader in accomplishing the project results. According to [12] terms like senior leadership, executive leadership and strategic leadership have been interchangeably used in literature for describing leadership. Irrespective of these appellations and their supposed duties, leadership has a critical role towards enhancing safety. To buttress this, [13] study advocated that individuals are more likely to be committed to safety and to engage in open communication regarding safety when they recognise that their organization demonstrate supportive actions and they are able to identify high-quality relationships with their leaders. Similarly, [14] posited that trust in management and perceived safety climate facilitated the relationship between a high performance work system and safety performance measured in terms of personal-safety orientation. These instances are pointers to the positive impact of leadership towards ensuring safety.

Investigations into major accident events have underscored leadership as an underlying contributory factor. For instance, The Fennell public inquiry into the 1987 King's Cross station fire wherein 31 people were killed, stated that there had been a collective failure from the most senior management level downwards over many years to minimise the outbreak of fire, and more importantly to foresee and to plan for an uncontrolled outbreak of fire at the underground station with a real potential for large-scale loss of life. In the same vein, following the aftermath of the Occidental Petroleum Platform disaster on the North Sea in 1988 where 167 deaths occurred, Lord Cullen's report noted that the quality of safety management by operators is fundamental to offshore safety and that no amount of detailed regulations for safety improvements could make up for deficiencies in the way that safety was managed by operators [15]. Although the Cullen report referred to leadership at higher levels of the organisational hierarchy, it has been demonstrated that leadership behaviour at all organisational levels, from senior management to front-line team leaders is critical for safety. Similarly, the Baker report into the BP Texas City 2005 refinery explosion identified that BP did not provide effective leadership on or establish appropriate operational expectations regarding process safety performance at its U.S. refineries and the panel believed that the lack of effective leadership was systemic, touching all levels of BP's corporate management having responsibility for BP's U.S. refineries.

As previously mentioned, the findings from these public enquiries and literature not only highlight leadership's role in ensuring safety but also give an indication of the relationship between leadership and safety performance within organisations. Even as these instances support the connection between safety and leadership, [16] argued that there have been very few studies in reference to the influence of top-level manager's leadership on safety performance. They suggested that majority of the studies have been centred on the influence of top-level managers, their leadership style in relation to financial performance, productivity and innovation. Thus what lies ahead will be to instigate further research into leadership style in relation to other sectors especially those which are safety critical like the offshore oil and gas industry.

3. Safety leadership and the offshore oil and gas industry

According to [16], safety leadership is a sub-system of organizational leadership. Safety leadership is the process of interaction between leaders and followers, through which leaders exert their influence on followers to achieve organizational safety goals under the circumstances of organizational and individual factors [17]. This process of interaction between the leaders and the followers affords an opportunity for sharing valuable insights on issues related to work place safety. Such interactions are very vital within the oil and gas industry because of the innate complexities that encompass most of its operations. Literature points out that several studies have captured issues bothering on safety leadership in the oil and gas industry. For example, [18] investigated the association between senior managers' perceived leadership style and the safety performance of their units. The findings of their study disclosed that leadership behaviours like intellectual stimulation, idealized consideration and contingent reward were significantly connected to lower accident rates. Studies identified and verified two important leadership behaviours. These behaviours were caring and controlling. The caring behaviour is concerned with paying attention to the welfare of the organization's members. This can be achieved by providing help when needed, establishing harmonious relationship

with subordinates, maintaining effective channels of communication and making available anything that will be beneficial to subordinates. On the other hand, the controlling behaviour deals with setting up organisational goals, establishing and maintaining performance levels, clarifying members' roles, expectations and duties and encouraging members to follow regulations and procedures.

[19] surveyed 200 offshore installation managers (OIMs) in charge of 157 production platforms and drilling rigs in the UK oil industry. Their study recognised four important safety leadership issues. These issues were (a) visibility at the worksite and leading by example (b) developing open, honest and trusting relationships with the workforce (c) workforce involvement and empowerment in planning and decision-making, thereby increasing workforce ownership and responsibility of safety performance, and (d) being proactive about safety.

From the brief literature reviewed a number of broad conclusions can be drawn. These conclusions give a suitable context for the research's aim and objectives. The literature reviewed highlights claims that past research on leadership and safety in the oil and gas seems to be appreciated and well detailed. Nonetheless, there are still glaring fragmentations in most of these contributions, thus justifying the need for additional research. For instance, none of these studies or others has explicitly focused on the senior manager and safety leadership role in Nigerian offshore operations. Majority of the available studies cited have solely focused on safety leadership in the United Kingdom, United States and Norwegian oil and gas industry. In the light of the above, this paper seeks to address senior managers' perceptions of safety leadership and their role towards facilitating safety performance in Nigerian offshore oil and gas projects.

4. Method

The main form of data collection comprised semi-structured interviews with senior managers in Nigeria's offshore oil and gas industry. Semi structured interviews were utilised because they provided the researchers with abilities to garner rich and in-depth information required [20]. The sample utilised was purposefully selected to engage participants with wide experience in the offshore industry. It was critical to find participants who had participated in offshore oil and gas projects. Consequently, fifteen senior managers were selected for interviews on the basis of their long term project management experience, with each participant having a long-standing familiarity on offshore oil and gas projects in Nigeria over a period of many years. The participants provided rich information regarding the offshore oil and gas projects they had participated in. Port Harcourt and Warri (south-south Nigeria) were the principal locations of all participants.

The average duration for each interview was forty five minutes. During the interviews, questions were focused on eliciting information on safety and leadership issues from current and past projects. All interviews were with the participants consent recorded and subsequently transcribed verbatim. Afterwards, they were managed through the use of qualitative analysis software package NVivo. The use of the NVivo led to the emergence of several themes. These themes were further clustered around the research objective thereby generating both descriptive and analytical data. The software also enabled the establishment of connections and at the same time, it supported the exploration of the emergent patterns.

5. Findings

5.1 Safety at work

Participants all seemed well informed on the importance of safety at work as well as related issues. Some cited the need for optimum performance as the main motivation for safety at work while other articulated their personal responsibilities to themselves and their organisations as their primary motive for adhering to safety. Generally, the issue of safety at work was regarded as a non-contentious subject since all participants acknowledged its importance and the role it plays in enhancing project/ overall organisational performance.

5.2 Leadership style and safety

The concept of leadership was extensively discussed, some of the questions bothered on leadership and leadership styles. The participants were asked to describe their various styles of leadership. From their accounts most participants acknowledged the existence of various forms of leadership. One participant elaborated the importance of sound leadership during offshore oil and gas projects. According to the participant, while leaders should be experts in their fields, they must also be capable of having transferable skills and interpersonal qualities needed to inspire other personnel to achieve the project and organisational objectives. Another participant also admitted that present day projects leadership should concentrate not just on rewards and performance of project personnel but also on softer issues such as their welfare and capacity enhancement. In summary, variety of leadership styles such as the transactional, transformational and autocratic styles were mentioned as major leadership styles utilised by most senior managers handling offshore oil and gas projects.

With regards to leadership style and safety, it was disclosed that when senior managers are able to demonstrate commitment to safety by their leadership style, personnel are spurred towards adopting better synergetic working patterns. Such synergetic patterns were often times responsible for higher levels of performance and productivity experienced during project operations. Thus it was concluded that leadership style has a role critical for the implementation of any effective safety management system utilised during offshore project operations.

5.3 Safety performance

Whilst the need for optimum safety during project operations was considered non-negotiable, the means of accessing its performance was discussed. Some participants explained that safety performance within their organisations and project operations define how well their safety system framework accomplishes its functions with respect to the specifications and conditions, for which it is designed. Another participant articulated that within their organisation's operations, safety performance is given uttermost attention and that it is usually assessed based on a comprehensive set of safety indicators. It was also established that cultural, human, behavioural, economic, psychological factors and environmental factors were key factors which may have both negative and positive consequence on safety performance.

6. Discussion

Safety plays a crucial role in the life cycle of any project. Literature cited earlier, indicates a growing recognition of senior manager's role towards establishing the relevant environment that supports workers to operate safer. Being a safety critical sector, most offshore oil and gas industry projects are characterised by having combination of human, technological, environmental difficulties and projects within the Nigerian offshore oil and gas industry are no exceptions. Although commendable efforts have been made towards improvement in the wake of certain disasters, this paper identified the need for more concerted efforts aimed at bolstering safety within the Nigerian offshore oil and gas industry. The finding from the interview raised some important issues.

Firstly, it noted that several leadership models are currently being utilised within the industry. Though the paper will not be discarding any of these styles, it will focus on common mentioned types based on the accounts provided by the participants. These models include: the transactional, transformational, the laissez-faire leadership models. In the laissez-faire model, the manager tends to withdraw from the leadership role and offers little in terms of direction or support. They are often indifferent to the needs of their followers. When this model is in force, subordinates are often in conflicts regarding their roles and responsibilities. They also exhibit tendencies to usurp the leadership role or seek direction and vision from elsewhere. In summary, the laissez-faire model can be considered essentially as a non-leadership model. According to [12], the Transformational leadership focuses on future development, and has also been called relationship-oriented leadership. [21] observed that such interactions usually result in better exchange quality and greater concern for welfare. Transactional leadership focuses on the link between rewards and performance and has also been called task-oriented leadership.

Although not explicitly mentioned by any participants, this paper also discusses the authentic leadership model. Authentic leadership can be construed as an overlap of the transformational leadership model. However, relying on

the positive organizational behaviour, full-range leadership and transformational leadership theory and ethical perspectives, [22] defined authentic leadership as a process that draws from both positive psychological capacities and a highly developed organizational context, which results in both greater self-awareness and self-regulated positive behaviours on the part of leaders and associates for the fostering of positive self-development.

Relating these models to safety, the paper argues that issues pertaining to safety must be communicated in not only a manner that stimulates understanding but in a way that promotes overall performance among project personnel. To achieve this, a great emphasis on the crucial role of leadership must be highlighted. Consequently, leadership which motivates team members to work harder, work efficiently, and take ownership of responsibility for safety performance should be encouraged. With regards to how senior managers can improve their commitment to safety and their role towards facilitating safety performance in Nigerian offshore oil and gas projects, this paper posits that embracing the authentic leadership model will be the way forward and a more fruitful model to adopt.

Authentic leadership fosters greater self-awareness, relational transparency, an internalized moral perspective and balanced processing in the sense of comprehensive information search and processing, resulting in positive self-development in followers, heightened levels of follower trust in the leader, engagement, workplace wellbeing, and veritable sustainable performance. This paper believes that by adopting these characteristics, senior managers can help drive the safety culture among their personnel. Additionally, the paper urges that the following issues should be given consideration by senior managers and safety leadership:

- Maintaining overall control for safety with active participation from all project personnel.
- Ensuring that established safety policies are not just laudable but also enforceable.
- Ensuring that all levels of project personnel are aware of and practice policies and procedures set out in their safety management programs.
- Administer the safety policies throughout their organisation by appointing a designated Executive responsible for the co-ordination of the safety performance on all company projects.
- Discipline, re-educate and/or train any personnel who fails to discharge their responsibilities satisfactorily and in line with organisational safety policies.
- Promote an organisation safety award scheme for deserving personnel and project teams.
- As a key part of lessons learnt from project operations, senior managers must introduce a mechanism for the reporting, investigating and costing of injury and damages. Such mechanisms will not only facilitate the identification of similar trends but will eliminate similar occurrences in future projects.

7. Conclusion

As the Nigerian offshore oil and gas industry continues to experience dynamic transformation, the need to adopt safety management standards that encourages more practical roles for senior manager and safety leadership must be encouraged. Therefore the paper advocates the way forward for senior managers and safety leadership in Nigeria's offshore oil and gas industry is to utilise leadership styles which take into account both technical aspects required for effective safety management and different aspects of interpersonal relationships. As such, it concludes that embracing the authentic leadership model will directly inspire vision, create genuine motivation of project personnel and optimise performance in line with organisational safety standards.

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