A COMPARATIVE STUDY ON ADOPTION OF HUMAN RESOURCE MANAGEMENT PRACTICES FOR HEALTH AND SAFETY MANAGEMENT SYSTEM IN OIL AND GAS CONSTRUCTION INDUSTRIES, NESTOIL AND AVEON OFFSHORE, PORT HARCOURT, NIGERIA

IZUOGU, Sunday Anthony

Department of Sociology, Imo State University, Owerri, Nigeria

sizuogu@yahoo.co.uk, sizuoguphd@gmail.com

Abstract

This study aimed to undertake a comparative study of HR practices adopted for occupational health and safety management on oil and gas construction projects in Nestoil and Aveon Offshore Nigeria and to investigate the relationship between HR practices and construction safety management outcomes (severity and frequency of accidents). The research method included exploratory interviews and industry surveys of Nestoil and Aveon Offshore Nigeria by email and post. Data were collected using structured questionnaire. Compared to Aveon Offshore Nigeria project, the results show that Nestoil project management practices place significantly more emphasis on highlighting occupational health and safety culture during induction processes to new workers and taking working experience into account during the selection process. On the other hand, Aveon Offshore Nigeria places more emphasis on providing appropriate personal protective equipment for workers. Many HR practices are significantly correlated with safety management outcomes. These include: taking age into consideration during selection process and giving feedback to workers about their unsafe behaviour. It is recommended that project managers adopt relevant HR practices that lead to more effective health and safety management system (HSE MS) on construction projects.

Keywords: Oil and gas construction; Health, safety and environment; HR practices HSE MS; HSE outcomes

1.0 Introduction

Safety management in the oil and gas construction industry is important because poor health and safety management system leads to accidents which sometimes result in fatality, loss of man hours and project delays. Previous research on safety focused on matters such as ergonomics (Amir, 2015), overall organizational safety culture (Olusiji, 2011), health and safety policy and procedures (Odogwu, 2010). Akanni (2018) found that site incidents often result from toxic attitudes, rather than equipment failures and procedure. Thus, management practices are important in helping to reduce accidents in the workplace.

The problem of this study is derived from the severity and frequency of accidents occurrence on oil and gas construction industry due to ineffective health and safety management system (HSE MS) on construction projects. Low significant roles of human resource management on occupational health and safety culture during selection and induction processes result in high rate of incident occurrence. This study is undertaken to bring to light the comparative view on adopting human resource management practices for health and safety management system in

construction industries of Nestoil and Aveon offshore which ensures that severity and frequency of accident occurrence is reduced.

The objectives of this paper are: (1) to undertake a comparative study of HR practices adopted for safety management by oil and gas construction projects in Nestoil and Aveon offshore Nigeria which comprised: Recruitment and Selection practices (RSP); incentives and rewards (IR); health, safety and environment training (HSET); communication and feedback (CF); workforce participation (WP); management commitment (MC); performance evaluation (PE); and safety-related welfare benefits (WB).; and (2) to investigate the relationship between HR practices and construction health and safety management system (HSE MS) outcomes.

This study focused on Nestoil and Aveon offshore Nigeria, and their HR practices vis-a-vis health and safety management system. As there are many types of construction accidents, this study focuses on three types of accidents: hand and finger injury, drop object incident, and electrical shock incident. This is because these accidents occur frequently in the construction industry (Nigeria Bureau of Statistics Gross Domestic Product Q2, 2017 Final Report).

The next section presents a literature review on the HR practices commonly adopted. This is followed by a description of the research method and the characteristics of the respondents. The survey results are next presented, followed by discussion, conclusion and recommendations.

2.0 Oil and Gas Construction Industry, Human Resource Management Practices for Health and Safety Management System in Construction Industries of Nestoil and Aveon Offshore Nigeria

A c omparison between Nestoil and Aveon offshore Nigeria is made to ascertain whether health and safety practices in the two companies have impacts on the HR practices adopted and how these affect health and safety management system. Nestoil's commitment to Health, Safety and Environment (HSE) is championed throughout all levels of the company and is embedded in every aspect of her operations. Safety is driven by their leadership and applied through their operating management system. There are some similarities and little differences on HSE practices between Nestoil and Aveon Offshore Nigeria. Some of the similarities are in the area that both companies use Employee's Compensation Act, 2010, Minerals Oils (Safety) Regulations, 1962, and Nigerian Safety and Security of Radioactive Sources Regulations, 2006. In Nestoil, oil and gas construction HSE is governed by the company's policy of zero tolerance to incidents. This is achieved by management constantly improving through planning and review of the work process for a suitable and effective HSE management system. The sources of employees in both companies are similar. Both companies make use of community personnel for certain positions. In Nestoil, due to community disturbances of construction activities, employees are recruited from neighboring communities such as Aboloma and environs. In Aveon Offshore, employees are recruited majorly from Rumuolumini community. The working hours on oil and gas construction sites in Nestoil are the same with Aveon Offshore. Both have eight working hours which is followed by two hours of overtime.

Accident statistics shows that overall workplace incident rates per 1000 workers for the Aveon Offshore are 2.1 (2014), 2.0 (2015) and 1.8 (2016) (Nigeria Bureau of Statistics Labour Force Population Data, 2016). In Nestoil, the overall workplace incident rates per 1000 workers have fallen from 2.0 (2014) to 1.1 (2015) and 0.9 (2016) (Nigeria Bureau of Statistics Labour Force Population Data, 2016). In the Aveon Offshore, incident rates in the construction sector per 1000 workers were 2.1, 1.0 and 0.5 for 2014, 2015, and 2016 respectively (Nigeria Bureau of

Statistics Labour Force Population Data, 2016). In Nestoil, construction incident/Accident rates per 1000 workers in the same periods were 2.1, 1.4 and 0.1 (Nigeria Bureau of Statistics Quarter 4 2017 Labour Force Report). Both companies have decreasing incident/accident rates, with Nestoil appearing to make more reductions in overall and construction incident rates.

The improved safety performance in Nestoil is achieved by the recent implementation of health and safety measures in Nestoil. Oil and gas construction health and safety management system in Nestoil has gained more attention from various parties such as the Ministry of Labour and Productivity (MOLAP) and Nigerian Content Development and Monitoring Board (NCDMB) in recent years after the last incidents. The Nigeria Factories Act was replaced by Workman Compensation Act (WCA) 2010 (WCA, 2010). Nigerian Content Act 2010 was issued to the industry, HSE Inductions and trainings were introduced after these incidents. HSE statistics of these companies show that construction industry's workplace incident rate is 0.5 per 1000 workers in 2017 as compared to 1.2 in 2015 (Workman Compensation Act (WCA), 2010). This is a good start towards achieving the target set in these companies HSE vision and Target, where the number of work- related incident is to be 0 per 1000 workers by 2017 (Organisational Health and Safety Policy). However, workplace accident in construction is still recorded as the highest among the other industries in Nigeria (Nigeria Bureau of Statistics Quarter 4 2017, Labour Force Report). This suggests that Nigeria's oil and gas construction industry is still beleaguered with health and safety problems.

With high oil and gas construction incident rates in both companies, effective measures in health and safety management system need to be identified in order to minimize incident and injuries on oil and gas construction sites. Improving construction safety may be undertaken in various ways such as using effective HR management practices.

3. Human Resource (HR) Practices

Effective HR practices are found to lead to positive organizational outcomes (Mohrman, 2016) such as turnover (Obisi, 2015) and productivity (Price, 2017). HR practices are generally categorized into the following: Recruitment and selection, HSE Incentives and Rewards, Health, Safety and Environment (HSE) Training, HSE Incentives and Welfare Benefits. These factors should appear as discussed below.

3.1. Recruitment and Selection

Recruitment and selection are part of HR practices adopted by the organisations in employment process. Terpstra and Rozell (2013) found that well-designed selection procedures improve overall organizational performance. During selection, the applicant's personality, experience and qualifications are checked. Employees' personality and safety behaviour are found to be correlated (Ok pewho, 2011). For example, employees' characteristics such as safe attitude to work (Adeyeye, 2011), competence (Bennett, 2018), certifications and experience (Nwachukwu, 2012) have been found to affect health and safety behaviour of employees.

Physical and mental ability is sometimes considered during recruitment and selection of employees because medical examinations are considered during recruitment and selection. Every individual has different physical and mental abilities and capacity to carry out the work (Ojo, 2012). It is important to select individuals who are medically fit to work safely within the organization's environment (Banjoko, 2015).

Selecting individuals with relevant working experience has been found to produce better safety outcomes (Odogwu. 2010). Ojo (2012) causal model of accidents shows that inadequate

job experience contributes to accidents. Besides, some studies believe that much consideration has to be put on the employees' alcohol and drug consumption habits during the hiring process in order to improve safety outcomes. Smith (2013) found that alcohol usage leads to injuries at the workplace. Some studies found that alcohol and drug abuse affects workers' ability to work safely (Aturu, 2015).

3.2. HSE Incentives and Rewards

Different types of HSE milestone achievement incentive programmes in the form of monetary and non-monetary rewards had been studied (Harshbarger and Rose, 2011). HSE incentives and rewards for working safely have been found in some studies to lead to a strong health and safety culture (Ong, 2015). In contrast, some studies found that projects that implemented monetary incentives possessed higher accident rates compared to those projects which did not adopt monetary rewards (Haines, 2011; Hinze, 2013). Some studies showed that consequence management like imposing query letter and warning letters are not effective ways to reduce incident and accident rates (Ong, 2015; Hinze, 2013).

It is important to consider whether HSE incentives should be given to an individual or a crew for working safely and achieving a milestone without lost time injury (LTI). Akpala (2017) found that crew/team incentives had a stronger positive relationship with injuries than individual incentives. Crew incentives emphasize the link between HSE incentive and teamwork (Aturu, 2012). This is because workers work interdependently and the task they perform will affect others in their crew and hence they should care more for each other (Etomi, 2018).

There are mixed results on the relationship between HSE incentives and reporting unsafe acts, unsafe conditions, near miss and incident/accident on site. Akpala and Adams (2017) found that there is no relationship between HSE incentives and reported or unreported unsafe acts, unsafe conditions, near miss and incident/accident on site. In contrast, Collinson (2018) found that employees tend not to report unsafe acts, unsafe conditions, near miss and incident/accident when bonuses and incentives were tied to HSE achievements.

3.3. Health, Safety and Environment (HSE) Training

HSE training is an effective HR tool in mitigating construction site incident/accidents (Chan, 2011). This is because training helps to improve workers' skills and abilities to identify hazards. According to Akpala (2017), incompetent employees may suffer injuries due to lack of experience, whereas a competent worker may follow the procedure and do task safely. Salminen (2014) found that incompetent workers have a higher unsafe act and injury rate, but a lower unsafe practice and incident rate as compared to competent workers. On the other hand, increase in experience may lead to higher incident rate, as experienced workers take up more job responsibilities, become over conversant with the procedures thereby taking short-cut and are exposed to risks (Fatoyeno, 2018). Through trainings, the importance of health and safety can be communicated (Timothy, 2017).

3.4. HSE Incentives and Welfare Benefits

HR practices may include HSE incentives welfare benefits for workers. Amadi (2012) pointed out the Nigeria oil and gas construction industries health, safety and welfare policies does not lay down welfare benefits in sufficient detail. Haslam and Gibb (2015) commented that since health and safety are highly interdependent, an integrated approach may help in improving construction safety. Theophanous (2015) suggested that workers should be provided with more personal time

and rest time. Additionally, Okonkwo (2014) found that health and safety practitioners should pay more attention to workers' safety welfare, such as 'implementation of accident insurance scheme', and not merely emphasizing on the implementation of health and safety rules.

4. K nowledge Gap

The brief literature review suggests that HR practices may have an impact on improving workplace safety. Nigerian Ministry of Labour and Productivity emphasized the adoption of human resource practices to improve health and safety. HSE is the primary focus of the construction industry, and it is known for its recommendations relevant to Nestoil and Aveon offshore Nigeria. Two studies on human resource (HR) practices to improve workplace health and safety have been conducted by Okonma and Williams (2018) and Amadi (2017). Okonma and Williams (2018) research focused on adopting HSE management system (HSE MS) practices to reduce incident/accident rates in the oil and gas construction industry. Hence, there is a gap in knowledge regarding the relationship between HR practices and oil and gas construction health and safety management system. The fieldwork was conducted to help fill this gap.

5. Research Methodology

An exploratory study in the form of semi-structured interviews was first carried out to investigate the causes of accidents in oil and gas construction industries and to find out the strategies to help reduce fatality. Three experienced HSE professionals from Aveon offshore Nigeria were selected based on convenience sampling. The interviews revealed that HR practices play an important part in health and safety management system. Based on the literature review and interview findings, questionnaire was designed. Pilot study was carried out to test the survey questions, identify ambiguous questions and test data collection techniques. The questionnaire was revised based on the interviewees' feedback and sent to them for further reviewing. Thereafter, the questionnaire was finalized. Section A of the questionnaire comprises general questions while section B includes questions on health and safety performance at project level and company level. Respondents were asked to rate the severity and frequency of injuries on their construction sites in the past 12 months on a 0 to 5 scale, where 0 = accidents did not happen and 5 = very severe or frequent. This is followed by section C where HR practices are divided into eight sub-headings (see Table 1). Respondents were asked to rate the extent to which HR practices were adopted by their firms on construction sites on a 5-point rating scaling where 1 = 'not at all' and 5 = 'to very great extent'. Respondents were also asked to rank, in priority order, the importance of the HR practices in improving health and safety in the company.

The population comprised general staff and subcontractors in Nestoil and Aveon Offshore Nigeria. The sampling frame for Nestoil consisted of large and medium sized subcontractors that are registered with the company. In Aveon offshore Nigeria, the sampling frame largely comprised staff in HSE Department in the company. Samples were randomly selected from these sampling frames. Copies of questionnaire were sent out by post and email. Survey results were collected and analyzed using SPSS software.

6. Data sample characteristics

From the 120 questionnaire sent out in each company, 90 and 89 responses were received from the Aveon offshore Nigeria and Nestoil respectively, giving an average response rate of 75% . All returned copies of questionnaire are usable. Data were checked, edited, coded and analyzed.

It is shown that majority of the respondents are senior management (58.8%) comprising CEOs, HR directors and managers, Quality control senior managers who are in different departments of the organizations. 41.2% of the respondents are middle management comprising HSE engineers, HSE coordinators, HSE superintendents, HSE supervisors, Quality control engineers and Piping Engineers. The average working experience of the respondents in the construction industry is 17 years. Most of the respondents have been involved in HSE management for more than 5 years. 72% of them indicated that their scope of work is strongly related to safety. This indicates that many of the respondents have sufficient knowledge and experience in HSE management system.

The characteristics of industries and profiles of projects undertaken are shown in Table 1 as collaborated with the questionnaire. Majority of the projects undertaken by the industries are offshore construction projects, comprising mainly EGINA UFR/FPSO projects which details OLT Piles, Bouyancy tank, and Mooring lines maintenance. There is a good spread of project value and duration. More projects in the Aveon offshore employed 100 to 1250 workers compared to Nestoil projects that are more labour intensive, thus employing more workers.

6.1. Health and Safety Performance of Firms

Mean for health and safety management outcomes (severity and frequency of accidents) of Aveon offshore and Nestoil oil and gas industries were computed. ANOVA was conducted to see if th ere is any significant difference between Aveon offshore and Nestoil data. The results are shown in Table 1.

'Falling from height' is the most severe type of incident (mean = 1.00) and occurred most frequently (mean = 0.58) on construction sites in Nestoil. In Aveon Offshore, apart from 'other incidents/accidents', the most severe and frequently occurring injuries that happened are 'struck by or against objects' (mean = 1.22 and 1.03 respectively). Nestoil may have more falling from height accidents because its construction projects are largely high rise due to daily activity of workforce.

The ANOVA results show that there is no significant difference in accident severity in the Aveon Offshore and Nestoil for the three main injury types. In terms of accident frequency, Aveon Offshore sample has significantly higher frequency than Nestoil in terms of 'stuck by or against object' injury. Aveon offshore sample also registered significantly more severe and frequent 'other accidents' than Nestoil.

The t-test results show means N 0, negative t-values and p b 0.05. This indicates that injuries do happen on construction sites but they are neither severe nor frequent. One possible reason for this is that the scale is subjective and this constitutes the limitation of the study. Another reason is that respondents may have been unwilling to rate truthfully as it may show that their sites are not well managed.

7. Data Analysis, Results and Discussion

The data from the questionnaire survey were analyzed based on the following HR practices as parts of the objectives of the study: Recruitment and selection practices (RSP); incentives and rewards (IR); health, safety and environment training (HSET); communication and feedback (CF); workforce participation (WP); management commitment (MC); performance evaluation (PE); and safety-related welfare benefits (WB). The results are discussed below.

7.1. Safety-Related Recruitment and Selection Practices (RSP)

7.1.1. Similar practices

Behavioural based questions that were asked during the selection process (RSP 1.5) are found to be positively correlated with severity of injuries arising from being drop object incident (r =

0.277, p = 0.027) in both industries. This may be due to supervisors assuming that if new workers can answer behavioural questions correctly during interviews, they are safety conscious and thus can work safely with little supervision. This results in higher severity in injury on workers who are struck by drop objects.

7.1.2 Dissimilar practices

Five safety-related recruitment and selection practices were stated in the questionnaire. Out of these, emphasizing organizational safety values to new workers during selection process (RSP1.1) is significantly practiced by Aveon offshore (mean = 4.26, p = 0.00), while Nestoil does not place significant emphasis on this. It is important to emphasize organizational safety values to workers even before they are selected or hired for the job so that workers know that their employers take zero tolerance for safety non-compliance. Study by Andi (2018) also shows that organizational health and safety culture influences workers' perceptions towards health and safety.

Table 2 shows that recruitment and selection practice adopted by Aveon Offshore Nigeria takes worker's experience into consideration during selection process (RSP1.4vi) (mean = 4.06, p = 0.00). There is less emphasis on workers' experience during recruitment and selection process in Nestoil as compared to Aveon Offshore. Majority of community members are employed in Nestoil through their community leaders and union. Mohamed (2013) found that workers' perception of risk is influenced by their work experience. This suggests that working experience is one of the important factors to be considered during recruitment.

7.2. Health and Safety-Related Incentives and Rewards (IR)

7.2.1. Similar practices

Based on the t-test results for similar practices (see Table 4), two significant practices for rewards and incentives are identified. The first practice that is emphasized in both industries is on giving out incentives based on individual's safety performance (IR 2.3i) as opposed to group incentive. This might be due to workers performing in a less stressful environment when individual incentive is adopted, as co mpared to group incentives because a worker's chance of receiving safety incentives will not be influenced by others.

However, some studies showed that group rewards lead to better organization’s health and safety performance compared to individual rewards or incentives (Bartol and Hagmann, 2012; Lauver, 2017). From the t-test result, it is observed that giving out incentives based on group's safety performance (IR 2.3ii) is not significantly adopted by employees in both companies (p N 0.05). The key reason for the difference in the results of this study and previous research is that construction workers are highly on project base and this prevents a worker from working with the same team throughout their stay with the company, unlike in oil and gas production industries where workers are permanent staff who have fixed work stations. Thus, group rewards is difficult to be carried out on construction sites.

The second practice that is adopted by the Nestoil and Aveon Offshore is applying consequence management on workers who violate health and safety rules on sites (IR 2.4). Common consequence management includes query letters, warning letters and dismissal to workers who are deterrents against violating health and safety rules. Study by Aksorn and Hadikusumo (2018) which identified warning letters as one of the critical success factors in influencing safety programme performance on sites is consistent with the results of this study.

There is a significant positive relationship between giving out HSE incentives (IR2.2i)

and frequency of other accidents (r = 0.282, p = 0.032). The more HSE Incentive are given out to workers when there are fewer accidents, the frequent 'other accident' happened on sites. This result adds to the hitherto varied findings. Haines (2011) and Vredenburgh (2012) discovered that HSE Incentives has no effect in reducing injuries at workplace. Teo (2015) found that HSE Incentives lead to better firm's health and safety performance. This suggests that HSE incentive is not a stable incentive for health and safety management system.

7.2.2. Dissimilar practice

When correlation analysis is carried out for dissimilar practices for incentives and rewards category, it is found that giving out rewards in non-monetary form for fewer accidents on construction sites (IR2.2i) is positively correlated with frequency of injuries caused by electrical hazards in Nestoil (r = 0.345, p = 0.049). This suggests that the more non-monetary reward is used, the more unsatisfactory is the safety management outcomes on construction sites in Nestoil. Fortunately, Table 4 shows that giving non- monetary reward is only practiced to some extent in the Aveon Offshore and very little extent in Nestoil.

7.3. Health, Safety and Environment Training (HSET)

7.3.1. Similar practices

The results in Table 2 show several health and safety training practices that are adopted by both Nestoil and Aveon Offshore. The similar practices in both companies are: implementing health and safety training for workers, emphasizing certain elements in safety training courses, providing and reviewing in-house health and safety training courses, training on workers' attitudes, using safety as a platform for communication, and sending less experienced workers for more training. These practices are discussed below.

The companies adopt safety training for workers to a great extent (ST3.1). This agrees with Lingard (2012) who also found that adequate health and safety training leads to better health and safety management system because it is the most direct way to increase workers' technical skills and awareness of safety. Safety training should include making workers more familiar with the tasks on site, and teaching them how to perceive potential hazards and consequences.

Oil and Gas construction firms of study in Nigeria have similar practices on contents for health and safety training: safe work procedures (ST3.2i), risk assessment (ST3.2ii), Personal Protective Equipment (PPE) usage (ST3.2iii), recognition of hazardous actions (ST3.2iv), and explanation of accidents' consequences (ST3.2v). These training elements give workers a better understanding of their work nature and use of protective equipment. Duff (2014) also found that health and safety training on procedures and equipment usage lead to better workers' safety behaviour.

These two companies of study do provide in-house safety training and reviewing in-house safety training courses (ST3.7). This indicates that the companies recognize the importance of safety training and are not providing training. In-house narrowed safety courses also meet specific needs of company (Hinze, 2013). Thus, it is important to customize a firm's own health and safety training for its workers to improve health and safety performance. Firms need to review health and safety training courses (ST3.7) to keep up with new developments and after accidents happen. Necessary changes to health and safety training have to be made to accommodate the lessons learnt from past incidents or mistakes. Lesson learnt usually comes in

the form of HSE Bulletin which is communicated to all workers either during tool-box talk, daily meetings and/or Supervisor meeting. Sawacha (2011) also found that review of health and safety training courses lead to better health and safety performance on oil and gas construction sites. However, it is important to take proactive rather than reactive approach. Thus, regular reviewing of health and safety training programmes is recommended.

It shows that both Nestoil and Aveon Offshore emphasize training workers' attitudes regarding safety (ST3.5). This is because workers' attitudes will influence the way they perceive the hazards in their work. The finding agrees with Ajzen (2011) who found training as being able to cultivate improved health and safety attitudes and subsequently, health and safe behaviour among workers.

In both companies, employees use health and safety training as a platform to communicate health and safety issues to workers (ST3.6). The result suggests that health and safety issues can be communicated more effectively between supervisor and workers in a face-to-face health and safety training as compared to other means such as emails or phone calls and WhatsApp.

Nestoil and Aveon Offshore emphasize more on sending incompetent workers than competent workers for retraining (ST3.9). Incompetent workers belong to the group of workers who are more susceptible to accidents because they lack knowledge in health and safety-related issues and lack skills in carrying out works safely. Aksorn and Hadikusumo (2018) also found that more attention should be paid to personal competency, job experience and sufficient training. There are some positive correlations found between health and safety training practiced by both Nestoil and Aveon Offshore and accident severity and frequency.

7.3.2. Dissimilar practice

Pearson Correlation result shows that among Aveon Offshore respondents, there is a significant relationship between adopting Electrical Risk assessment system and frequency of incident that involves electrical hazards coming from welding activities ($r = 0.421$, $p = 0.015$). The finding suggests that the more the electrical bonding system is adopted, the more frequent electrical hazards related incident happen on Aveon Offshore Nigeria. Taking the findings together, it indicates that electrical bonding system is not popular and when implemented, does not lead to positive health and safety management system.

7.8. Welfare Benefits Relating to Safety (WB) - HSE Incentives

7.8.1. Similar practice

Safety and health campaigns (WB8.3) is significantly practiced on both Aveon Offshore and Nestoil (see Table 2). These campaigns help to increase awareness among workers. Cheng (2014) suggested that there should be ongoing promotion of safety and health campaigns in oil and gas construction projects from inception to completion. In Aveon and Nestoil, there is monthly HSE Incentive/award given to best HSE performance worker of the month.

7.8.2. Dissimilar practice

The dissimilar practice for welfare benefits is the extent to which Aveon Offshore and Nestoil provides rest areas such as shelters on sites for workers to rest (WB8.1). Table 6 shows that this practice is less emphasized by Aveon offshore, with only 35% of respondents providing such welfare benefit to workers. On the other hand, 97% of respondents in Nestoil said the company

provides rest areas for workers. A possible reason Nestoil provides more rest areas for workers is due to the community disturbances if such are not provided. It is a known fact that most of the workers in Nestoil are employees from neighbouring villages and communities who also are stakeholders in the company.

8. Conclusion

It is the affirmed opinion of this paper that some practices are adopted by both companies to a similar extent, suggesting that there are some common HR practices that are important to HSE management system. These include: giving out incentives based on an individual's safety performance; providing health and safety training; and providing welfare benefits. It is concluded that these HR practices are important for health and safety management system and should be emphasized for both companies in Nigeria.

9. Recommendations

- It is recommended that if the identified lapses and challenges in HR practices adopted for occupational health and safety management on oil and gas construction projects in Nestoil and Aveon Offshore Nigeria are addressed and the relationship between HR practices and construction safety management outcomes are significant then severity and frequency of accidents will be reduced to zero level.
- It is recommended that community culture of these companies should not be allowed to by the management and government to influence HSE culture and expertise in recruitment and selection of employees. If this is achieved, accident rate will be reduced.
- There is need for future research to be undertaken to study universal HR practices to improve health and safety of oil and gas construction industry.
- A future study to collect more sets of data could potentially reveal if there is a significant correlation between incident rates and characteristics such as the project type and the average project duration.
- There is need to ensure that the HR practices which are significantly correlated to health and safety management outcomes (accident severity and frequency) be adopted in order to bring accident severity and frequency to zero: taking age, height and build into account during selection; giving feedback to workers on their unsafe behaviour; and allowing workers to participate in decision making relating to health and safety.
- Oil and Gas construction industries are recommended to consider formulating health and safety policies based on HR practices that are found to be effective to improve health and safety management system on oil and gas construction sites. However, it should be noted that HR practices for health and safety should fit the organization's culture and industry practices as well as health and safety regulations and procedures.
- More data on HSE management outcomes should then be investigated. As this study is focused on finding out what are the effective HR practices to improve oil and gas construction health and safety, a more in-depth study can be carried to study on how to carry out the HR practices on construction sites.
- In addition, case studies on industry's adoption to HR practices for health and safety can be carried out to substantiate the quantitative data collected in this study. This will help one to understand the mechanism between HR practices and oil and gas construction health and safety.

Table 1.

Table 1: Health and Safety Performance of Firms

Incident type	Aveon Offshore			Nestoil			ANOVA (Combined data)		
	Mean	t-value	p	Mean	t-value	p	Overall mean	F value	p
Severity									
Hand and Finger Injury	1.22	−8.50	0	0.79	−13.06	0	1	1.62	0.207
Drop Object Incident	1	−8.93	0	1	−10.49	0. 00	1	0	1
Electrical hazard	0.16	−36.74	0	0.06	−81.54	0	0.11	0.93	0.339
Other accidents	1.47	−9.76	0	0.67	−13.38	0	0	7.34	0.009 *
Frequency									
Hand and Finger Injury	1.03	−12.79	0	0.48	−19.13	0	1.07	4.83	0.032 *
Drop Object Incident	0.5	−23.36	0	0.58	−20.23	0	0.54	0.15	0.696
Electrical hazard	0.12	−58.56	0	0.03	−114.50	0	0.08	1.95	0.168
Other accidents	1.6	−8.17	0	0.58	−16.28	0	1.1	11.9	0.001 *

Note: Rating scale: 0 = accident did not happened; 1 = not severe/frequent; 5 = very severe/frequent.

- Safety outcome that is significantly different.

Table 2: Summ ary of Dissimilar HR Practices in Aveon Offshore and Nestoil

Dissimilar HR practices	ANOVA	t-test (Aveon Offshore sample)			t-test (Nestoil sample)			
HR Practices	F Value	P	Mean	t-value	P	Mean	t-value	p
HSEEP1.1	12.585	0.001	4.26	7.829	0.000*	3.33	1.609	0.117
HSEP1.4i	28.514	0.000	1.54	−9.074	0.000	3.06	0.255	0.801
HSEP1.4ii	19.529	0.000	1.60	−9.777	0.000	2.73	−1.272	0.213
HSEP1.4iii	5.961	0.017	1.69	−8.341	0.000	2.33	−3.084	0.004
HSEP1.4iv	7.213	0.009	1.77	−7.716	0.000	2.42	-3.116	0.004
HSEP1.4v	5.454	0.023	2.29	-3.318	0.002	2.91	-0.594	0.557
HSEP1.4vi	16.269	0.000	4.06	6.458	0.000*	3.18	1.292	0.206
IR 2.1	4.828	0.032	2.46	−3.180	0.003	3.06	0.279	0.782
IR 2.2ii	4.462	0.039	3.25	1.000	0.326	2.55	−2.045	0.049
ST 3.11	20.926	0.000	1.46	−5.252	0.000	3.24	0.955	0.347
CF 4.3	6.063	0.016	2.63	−2.074	0.046	3.27	1.427	0.163
WP 5.3	5.400	0.023	3.37	1.886	0.068	2.76	−1.391	0.174
WB 8.1	53.260	0.000	2.55	−2.186	0.037	4.36	9.527	0.000*

References

Adeyeye, J.O. (2011). "An evaluation of human resource management (HRM) practices in Nigerian universities: The impact of size". *The Social Sciences* 4 (5): 494-498.

Ajzen, I. (2011). "The theory of planned behaviour". *Organizational Behaviour and Human Decision Processes* 50 (2): 179–211.

Akanni, O. C. (2018). "Project safe talk and management commitment: Safety communication: Training for construction workers". *Saipem Nigeria Symposium 2018*: Lagos ark Tower, Nigeria

Akpala, A. (2017). "Human resource safety practices and employee injuries". *Journal of Managerial Issues* 19 (3): 397–413.

Akpala, A. and Adams. (2017). "Get safety problems to the surface: Using human resource management practices to improve injury reporting". *Journal of Leadership and Organizational Studies* 14 (2): 168–179.

Aksorn, T., Hadikusumo, B.H.W. (2018). "Critical success factors influencing safety program performance in China construction projects". *Safety Science* 46 (4): 709–727.

Amadi, P. (2012). *"Nigeria oil and gas construction industries health, safety and welfare policies; Questions and answers: A practical approach",* 2nd ed. Thomas Telford, London.

Amir, E. (2015). *"Ergonomics at work: Human factors in design and development",* 3rd ed. John Wiley and Sons Ltd., England.

Aturu, B. (2012). "Team-based pay plans: A key to effective teamwork". *Compensation and Benefits Review* 24 (6): 24–29.

Aturu, B. (2015). *"Nigerian labour laws: Principles, cases, commentaries and materials".* Lagos: Friedrich Ebert Stiftung.

Banjoko, S.A. (2015). "Warnings: A supplement not a substitute for other approaches to safety". *Ergonomics* 38 (11): 2155–2163.

Bartol, E and Hagmann, D. (2012). "Factors affecting safety performance on construction sites". *International Journal of Project Management* 17 (5): 309–315.

Bennett, N. (2018). "A causal model of the relationship among accidents, biodata, personality, and cognitive factors". *The Journal of Applied Psychology* 74 (1): 81–90.

Carstensen, O., Jepsen, J.F., and Nielsen, K.J. (2006). "Worker participation in change processes in a Danish industrial setting". *American Journal of Industrial Medicine* 49 (9): 767–779.

Chan, A.P.C. (2011). "Study of attitude change in people after the implementation of a new safety management system: The supervision plan". *Construction Management and Economics* 19 (4): 393–403.

Collinson, D.L. (2018). "Surviving the rigs: Safety and surveillance in offshore oil installations". *Organization Studies* 20 (4): 579–600.

Comell, A.S.(2010). "Organizational aspects of engineering system safety: The case of offshore platforms". *Science* 250: 1210–1217.

Edenburgh, A.G. (2012). "Organizational safety: Which management practices are most effective in reducing employee injury rates"? *Journal of Safety Research* 33 (2): 259–276.

Edmond, D. (2017). "The relationship between corporate culture and health and safety performance". *Professional Safety* 12 (42): 29–33.

Employee's Compensation Act, 2010,

Etomi, A. (2018). "The role of safety climate and communication in accident interpretation: Implications for learning from negative events". *Academy of Management Journal* 41 (6): 644–657.

Fang, D.P., Maxwell, F. (2014). "Construction safety management: an exploratory study from China". *Construction Innovation* 4 (4): 229–241.

Fatoyeno, M.R., (2018). Predictors of work injuries among employed adolescents. *The Journal of Applied Psychology* 83 (4): 565–576.

Garrett, R.B., Perry, A.J., (2016). A safer way to improve construction site injury prevention. *Occupational Health and Safety* 65 (9): 60–64.

Goranty, I.V., Solomon, M.S. (2014). "Perceptions of safety management and safety culture in the aviation industry in New Zealand". *Journal of Air Transport Management* 10 (4): 231–237.

Haines, E. B. (2011). "Factors affecting safety performance on construction sites". *International Journal of Project Management* 17 (5): 309–315.

Harshbarger, D., Rose, T. (2011). "New possibilities in safety performance and the control of workers compensation costs". *Journal of Occupational Rehabilitation* 1 (2): 133–143.

Haslam, R.A., & Gibb, A.G.F. (2015). "The quality of accident and health data in the construction industry: interviews with senior managers". *Construction Management and Economics* 17 (2): 197–204.

Hinze, J. (2012). "Safety incentives: Do they reduce injuries"? *ASCE Practice Periodical on Structures and Construction* 7 (2): 81–84.

Hinze, J. (2013). "Factors that influence safety performance of specialty contractors". *Journal of Construction Engineering Management* 129 (2): 159–164.

Ibrahim, T.S. (2016). "Using scorecards to measure safety performance". *Journals of Professional Safety* 44 (12): 23–28.

Ikenna, E. (2016). *"Business psychology and organizational behavior"*. Psychology Press, New York.

Kerr, M.S., Wells, R.P., and Ibrahim, S. (2016). "Evaluation of a participatory ergonomic intervention aimed at improving musculoskeletal health". *American Journal of Industrial Medicine* 49: 801–810.

Lauver, V.Y (2017). "Understanding reactions to safety incentives". *Journal of Safety Research* 32 (1): 17–30.

Lingard D. (2012). "Improving safety by the modification of behaviour". *Journal of Construction Management and Economics* 12: 67–78

Minerals Oils (Safety) *Regulations, 1962,*

Mohamed W.D. (2013). "Occupational health and safety workplace arrangements for the modern labour market". *Journal of Industrial Relations* 47 (1): 91–116

Mohrman, A.M. (2016). "The impact of human resource management on organizational performance: Progress and prospects". *Academy of Management Journal* 39: 779–801

Nigerian Safety and Security of Radioactive Sources Regulations, 2006. Cited in Nigeria Country Profile on Occupational Safety and Health 2016

National Environmental Standards and Regulations Enforcement Agency Act, 2007
Nigeria Bureau of Statistics Labour Force Population Data, 2016

Nigeria Bureau of Statistics Quarter 4 2017 Labour Force Report

Nwachukwu, C. C. (2012*). "Management: Theory and practice".* Lagos: Africana-First Publishers.

Obisi, C. (2015). "The impact of human resource management practices on turnover, productivity, and corporate financial performance". *Academy of Management Journal* 38 (3): 635–672.

Odogwu. C. (2010). "Safety behaviour and safety management: Its influence on the attitudes of workers in the Nigeria construction industry". *Engineering, Construction and Architectural Management* 7 (2): 133–140.

Ojo, F. (2012). *"A Review of the Industrial Accident Literature".* HMSO, London.

Oknoma , C & Williams, J. (2018). "Communication strategies for achieving a total safety culture: employers need to overcome the perception that giving safety-related feedback creates interpersonal conflict". *Occupational Hazards* 70 (7): 49–51.

Okonkwo, C.E. (2014). "Management attention to workers' safety and welfare in organisations*" International Journal of Safety Management* 17 (5): 309–315

Okpewho, I. (2011). "Accident tendency, avoidance learning, and perceptual defense". *Academy of Management* 39 (4): 779–801.

Olusiji, P. (2011). Safety culture and risk management in organizations. *Journal of Cross-Cultural Psychology* 22 (1): 129–140.

Ong, D.S.Y. (2015). "Fostering safe work behaviour in workers at construction sites". *Engineering, Construction and Architectural Management* 12 (4): 410–422.

Ossai, I. (2013). "Scorecard approach to benchmarking organizational safety culture in Construction". *Journal of Construction Engineering Management* 129 (1): 80–88.

Price, A. (2017). *"Industrial relations and productivity in the Nigerian oil and gas industry".* Brookings Institution, Washington, DC.

Ruth, J.M. (2014). Not everything is a safety problem. *Occupational Health and Safety* 73 (8): 4–15.

Salminen, S. (2004). "Incompetent workers and injure rate in the oil and gas industry; An international literature review". *Journal of Safety Research* 35 (5): 514–521.

Sawacha, E. (2011). "Factors affecting safety performance on construction sites". *International Journal of Project Management* 17 (5): 309–315.

Shaar, A ; Fredericks, T.K., Butt, S.E. (2016). "An investigation of management's commitment to construction safety". *International Journal of Project Management* 24 (2): 167–174.

Smith, G.S., (2013). "Worker substance use, workplace problems and the risk of occupational injury: a matched case–control study". *Journal of Studies on Alcohol* 64: 570–578.

Teo, B.E (2015). "Construction workers perceptions toward safety culture". *Civil Engineering Dimension* 10 (1): 1–6.

Terpstra, D.E., Rozell, E.J. (2013). "The relationship of staffing practices to organizational level measures of performance". *Personnel Psychology* 46 (1): 27–48.

Theophanous F. E, (2015). "Employees' time and rest at workplace", Journal of Safety Management and Research 34 (2): 199–205

Timothy, I .S, (2017). "Reinforcing safety values in people". *Professional Safety* 42: 20–26.

Urrabazo-Kane, C. (2016). "Management's role in shaping organizational culture". *Journal of Nursing Management Issues in Collaboration with Nursing Management* 14 (3): 188–194.

Vredenburgh, V.I.O (2012). "Effects of HSE Incentives in reducing injuries at workplace"; *International Journal of Health and Safety Management* 17 (5): 309–315

Zimobi, J.E., & Okparakwe, J.P. (2012). *"Nature of the Construction Industry: Just-In-Time Productivity for Construction".* SNP Publishers, pp. 36–52.

Zimohar, E. (2010). "Safety climate in industrial organizations: theoretical and applied Implications". *The Journal of Applied Psychology* 65 (1): 96–102