**―DEVELOPMENT OF TWO PSYCHOLOGICAL INSTRUMENTS FOR PREDICTING SAFETY MANAGEMENT PRACTICES**

**IN SELECTED WORK ORGANISATIONS‖**

**BY**

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**============**

**BEING A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, UNIVERSITY OF LAGOS, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF DOCTOR OF PHILOSOPHY(Ph. D) IN PSYCHOLOGY OF THE UNIVERSITY OF LAGOS, AKOKA, YABA, LAGOS, NIGERIA.**

**APRIL, 2013**

# SCHOOL OF POSTGR DUATE STUDIES

**A**

**UNIVERSITY OF LAGOS**

***CERTIFICATION***

**This is to certify that this Thesis:**

## ―DEVELOPMENT OF TWO PSYCHOLOGICAL INSTRUMENTS FOR PREDICTING SAFETY MANAGEMENT PRACTICES

**IN SELECTED WORK ORGANISATIONS‖**

Submitted to the School of Postgraduate Studies University of Lagos, Nigeria.

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Is a record of original research carried out By

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***DEDICATION***

This thesis in its entirety is dedicated to the glory, honour and adoration of THE ALMIGHTY GOD; the Creator of the Entire Universe; ONE, who surmounts every impossibility and has the final say to any situation. HE is the God of all flesh and there is nothing difficult for HIM.

Also, dedicated to the memory of my beloved father, Late Nze Cyriacus Amajuoyi Osuagwu

(OME UDO 1 of AMATO ALIKE, OBOWO LGA, IMO STATE) , whose love for

education inspired this great height in my life, but departed from this world a year before now; and to my beloved mother – Lolo Janeth Amajuoyi Osuagwu (Nee Ada-Ibeakalam) for her love.

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***ABSTRACT***

*The main objectives of this study are to: (i). develop two valid and reliable psychological instruments for assessing safety management practices (SMP) and situation awareness (SA) in accident-prone Nigerian work organizations; (ii). investigate the relationships between situation awareness and safety management practices in the selected Nigerian work organizations; ;(iii)*

*determine how situation awareness and safety management practices would predict effective performance (commitment, involvement and general effectiveness) of workers in the selected Nigerian organisations (iv) . compare the differences in situation awareness between the selected Nigerian public and private sector organisations;(v ). determine the differences in safety management practices between the selected Nigerian private and public sector organisation;(vi) . examine gender differences in situation awareness among the employees of the selected Nigerian work organisations; and (vii). assess organisational cadre differences in situation awareness.*

*To accomplish the set objectives, two inter-related studies were carried out, namely: (1). Development and standardisation of two psychological instruments (SAQ & SMPQ) and re-validation of Organizational effectiveness test (OEQ) with Nigerian sample. Here, local norms were established for the instruments. (2). Assessment study in which a test battery of seven instruments (BIO-DATA, SAQ, SMPQ, OCQ, JIQ, OEQ & OSQ) were administered concurrently to 600 participants sampled through Multi-Stage and Stratified randomisation techniques; selected from twenty –six( public and private) organisations considered to be accident-prone on equal number, gender and cadre basis. A total number of six hypotheses were postulated for the study out of which three were confirmed, while three were rejected.*

*Relevant statistics were used in analysing data and findings showed that: (a). nine component factors were extracted from Safety management practices test, while three factors were extracted from Situation awareness test; (b). the developed instruments (SMPQ & SAQ) have high reliability coefficients and high concurrent validity coefficients with Offshore safety test (OSQ); (c). safety management practices and situation awareness were found to have significant positive correlation (r = 0.21\*; P < 0.05 );(d). situation awareness and safety management practices significantly and positively predicted the effective performance (OC, JI & OE) of workers in the selected organisations; (e). the private sector organisations significantly scored higher than the public sector organisations on situation awareness; (f). no significant difference was established between organisational types on safety management practices; and (g). gender and cadres did not record significant differences on situation awareness.*

*Finally, the findings, implications and limitations of the study were discussed, while recommendations, contributions to knowledge and suggestion for further research were put forward.*

## CHAPTER ONE INTRODUCTION

### Background to the Study

Over the years, people employed in all forms of industrial/organisational activities have been killed at work, while some large numbers have been injured seriously enough to keep them off work for many days. Reports have indicated that injuries causing disability for more than one year is enormous and fatal injuries rate has averaged out 50 per 100,000 employees (O`Dean and Flin, 2003). There are indications that many organisations in Nigeria do not have accurate records of what injuries and accidents occurring on their sites, because less than half of the possible numbers of work organisations report their casualties.

The basic fact is that many organisations (public & private) in Nigeria do not have consideration for safety standards, policies and programmes, hence their employees rampantly fall victims of industrial hazards (Eze, 2004a; Amaechi, 1990 and Thomopulus, 1981). Eze (2004) stated that “most Nigerian organisations are not employee-oriented, and therefore, the safety and health of the workers are not well catered for”. He further stated that “ a great deal of the manufacturing organisations are of the international partnership type, and are out to maximize profit, with the consequent absence of any human consideration towards their workers”(Eze, 1995, 2004b). In line with this view, Amaechi (1990) also noted that in the textile industries where great deals of noise and fabric particles are produced, the workers are not at all protected from these hazards. Thomopulus (1981), while commenting on occupational safety in the Nigerian petroleum industry, identified the psychological effects of noise from blowers and compressors to include predisposition to annoyance, poor concentration, inability to relax, and impaired speech communication.

Safety policies and programmes are concerned with protecting employees and other people affected by what a company / organization produces or does against the hazards arising from their employment or their links with the organization.

Industrial and corporate safety programmes deal with the prevention of injuries and accidents arising from working conditions and circumstances as well as minimizing the resulting loss and damage to persons and to property. Consequently, safety programmes involve two main elements viz.

(1).The diagnosis and assessment of health hazards and stress at work; and (2).The measurement and physical control of environmental hazards.

Industrial and corporate safety programmes need to be considered against the background of the factors that affect health and safety at work. Thus, the basic approach to safety management is that the employer who wants to prevent injuries in the future; to reduce loss and damage; and to increase efficiency and effectiveness, must look systematically at the total pattern of accidental happening (i.e. whether or not they caused injuries or damage).

Achieving relative safety standards in organisations requires adequate policy statement and effective framework of an action plan. The first aim concerning the health, safety and welfare of persons at work under the fact that policies of the government such as the Health and Safety at work Act 1974 extends obligations and protection to employees in all sectors of the economy including hospitals, educational establishments, research laboratories etc. This is based on the concept of a general duty of care for most people associated with work activities.

Consequently, the concepts of industrial safety requires that process such as damage control should be initiated using techniques that indicate that a thorough study should be made of the total systems of work and of the working environment, in so far as these contribute to accidents. Consequently, the nature of safety procedures requires a clear

definition of safety arrangement that indicate how the general policy statement is to be put into effect.

Great deal of work involved in construction, service and manufacturing industries has the capacity to be hazardous, and notwithstanding the safety rules and regulations in place to ensure that the risk of accident is kept to the barest minimum, accident still occur. One major and common factor in industries (Example, Construction, Aviation, Oil Drilling, Power Supply, Manufacturing and Cargo Carrying) and other work organisations which contribute to occurrence of accidents is a reduction in “Situation Awareness‟ (SA) of those concerned. When work is potentially hazardous, good situation awareness is very important, given that workers must accurately discern and adequately monitor conditions in order to reduce accidents.

Accident analyses have shown that a team can lose their shared awareness of the situation when it is vital to the safety of their operation. This may be particularly relevant to crews, miners, pilots, machine operators in the manufacturing and construction industries, cargo carriers in the shipping industry and power and energy supply industries, given the interactive and hazardous nature of their work. That way, lack of or reduced situation awareness may be a predictor of likelihood of an accident occurring. This also means that when an employee lacks the awareness of his organisational environment, his commitment, involvement and effectiveness in his workplace will be lacking. On the other hand, the ability of an employee to adequately perceive the stimuli in his environment, comprehensively interprete the stimuli and appropriately apply his gained experience to project for future actions will obviously make him safe, effectively involved and committed to the activities in his organisation. This is because he has the full awareness of the environment which enables him to operate in a manner that guarantees safety.

In Nigeria, the „care-free‟ attitude of employees and organisational management towards safety awareness promotion, their concern for productivity and profit maximisation have brought to bear frequent incidents of hazards, that often threaten lives and the continuity of the organisations. Employees can only be safety conscious when such consciousness is

driven by the management through their result-oriented activities/programmes towards proficient safety management. That way, the employees‟ situation awareness is enhanced and team situation awareness achieved for effective commitment and involvement of the workforce in the realisation of organisational effectiveness and goals.

Situation awareness (SA) in this regard is one of the safety factors in which the relationship with organisational commitment, involvement and effectiveness was investigated in this study.

Furthermore, a stringe of high profile disasters over the past two decades has indicated the role that organisational issues play in the etiology of accident (OECD Nuclear Agency, 1987; Sheen, 1987; Gullen, 1990; Vaugh, 1996). An understanding of the socio-technical processes behind these accidents led to investigations moving away from a focus on circumstances operating at individual level, to investigating potentially more weaknesses in the organisation as a whole. As a matter of fact, theories of accident process have broadened to include organisational process and the psycho-social domain (Turner and Pidgeon, 1997). To this effect, another major safety factor of this study is safety management practices in which many other factors are subsumed.

Since the early 1990s, Safety management has been a major focus on scientific research and of regulatory attention. The primarily technical focus of the first age of risk control was supplemented in the 1960s by an increasing concern with human factors. The major disaster of that era, such as the Three Mile Island incipient nuclear meltdown showed that ensuring safety in complex technologies was not just a matter of getting people to simply comply with safety rules. Competent and well-intentioned operators could unleash and fail to control risks in unclear or unexpected circumstances.

Research has shown that accidents could only be put down to deliberate risk taking or flagrant rule violation in a few instances. In most cases, the roots of accidents and disasters in industrial-organisations lay in much more subtle interactions between people and technology.

In the last quarter of the 20th century, the focus of major accident enquiries moved deeper into the antecedents of disasters and entered the third age of safety management control. Both technical and human failures were seen as things which organisations could and should predict, control and cater for. Safety was seen as something which could be achieved despite technological and human failures if there was a robust design and safety management system. The analyses of such accidents as the Seveso Chemical Plant, the Challenger space shuttle, the roll-on and roll off ferries, series of rail disasters in the United Kingdom all pointed to weaknesses in the safety management of the companies and industries, and in the regulatory frameworks governing them (Hale, 2003).

At this time, governments were seeking to modernize and revolutionise their safety legislation especially in the North-West Europe where there was a move away from detailed, prescriptive laws and regulations aimed at specifying the technical preventive measures to be implemented. These however proved too expensive for governments to keep up to date and were always trailing behind new developments in technology. Above all, they placed the responsibility for devising the means of risk control not with the companies and industries which generated the technology and the risk, but with the regulator. These regimes were replaced with framework legislation requiring companies to develop their own safety management systems to specify, implement and evaluate the detailed preventive measures. Some of this work has been driven by the interests of the legislators in assessing the adequacy of the management systems. As a spin-off, it led to attempts to develop national and international standards for safety management, modeled on the ISO 9000 series for quality management and the ISO 14000 series for environmental management systems.

The other pressure which has furthered research and practice in safety management has been the desire of major hazard-companies to protect their own assets and images. Corporate managers as in the same way as regulators, ensured that the different sites of the company were managing risk and company image competently. For instance, if they planned to take over another company, they usually assessed how well its safety is managed and if they planned to reorganise, outsource or restructure the company‟s

management, they would like to know whether this will dangerously weaken safety management and so on, hence their concern for safety management.

Above all, it is evident that while the developed nations of the world spend fortune planning and ensuring safety in their operational environments at individual, societal, organisational and national levels, the underdeveloped and “developing” nations (Africa countries generally and Nigeria imparticular) seem not to understand the importance of safety in any human endeavour. The Nigerian Labour Act of 1974, Factory Act of 1978 and Workman‟s Compensation Decree of 1989 aimed at protecting the rights and needs of the Nigerian workers to safety and compensation, unfortunately the enforcement and implementation of these laws have not met the expectations of Nigerian workers, and neither has it contributed to the effectiveness of Nigerian organizations.

The effects of this neglect (safety management) have obvious consequences on the lives and property on one hand, and on the organisational commitment, job involvement and organisational effectiveness on the other hand; hence another concern of this study.

* + 1. **Organisational Commitment**

The concept of organisational commitment is as old as man in his engagement with work in the organisation, hence of great interest to psychologists because of it‟s strong relationship with favourable organisational outcomes. Organisational commitment is defined as “the relative strength of an individual‟s identification with and involvement in a particular organisation” (Mowday, Porter & Steers, 1982).Organisational commitment was initially conceived as a reflection of observed behaviours of employees (Becker, 1960; Porter, Steer, Mowday & Boulian, 1974), who emphasised the longitudinal aspects of organisational commitment and conceptualised the attitudinal view by defining the concept in terms of individual‟s identification with and involvement in a particular

organisation. Hoffman, Inelson & Stewart (2010), characterised this type of commitment to the following three factors:

1. a strong belief in and acceptance of organisation‟s goal and values
2. a willingness to exert considerable effort on behalf of the organisation and
3. A definite desire to maintain organisational membership.

At the individual level of analysis, organisational commitment predicts important employee‟s behaviours such as staff turnover, absenteeism, or organisational citizenship or extra-role behaviour, and performance (Steers, 1977; Mathieu & Zajac, 1990; Allen & Meyer, 1996; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Gelade & Gilbert, 2006; Siders, George & Dharwadkar, 2001; and Jaramillo, Mulki & Marshall, 2005). At the organisational level, high levels of commitment are associated with improve levels of customer satisfaction and sales achievement (Gelade & Young, 2005).

### Job Involvement

Job involvement is another important and popular concept in organisational management, which has also been defined by many scholars. Lodahl and Kejner (1965) defined job involvement as the degree of daily absorption a worker experiences in his or her work activity. Job involvement is defined as the degree to which a person psychologically identifies with his job. Job involvement is related with the work motivation that a person has with a job (Blau, 1986; Blau & Boal, 1987; Bashaw & Grant,1994; Hackett et al., 2001).

Furthermore, job involvement describes the extent to which a person‟s self-esteem depends on his/her work efficiency. The two key elements of the definition of job involvement are: the psychological identification with work and the importance of work productivity or efficiency to the individual self-esteem. Elankumaran (2004) noted that human behaviour plays a significant role in maximizing organisational effectiveness regardless of technological development. In order to achieve organisational effectiveness, members of the organisation are required to put in a higher level of job involvement. Job involvement is the internalisation of values about the work or the importance of work according to the individual (Akinbode, 2011). Job involvement improves the individual‟s socialisation process with the organisation. Organisational socialisation is the process by which an individual understands the values, abilities, behaviours and social knowledge indispensable for an organisational role and for taking part in as a member (Ramsey, Lassk & Marshall (2001).

Job involvement is grouped into four units. These are : (1) work as a central life interest,

(2) active participation in the job, (3) performance as central to self-esteem, and (4) performance compartible with self-concpt. In work as a central life interest, job involvement is said to be the degree to which a person regards the work situation as important and as central to her identity because of the opportunity to satisfy main needs. In active participation in the job, high job involvement encourages the opportunity to make job decisions, to make an important contribution towards the organisational goals, and self-determination. Active participation in the job is thought to ease the achievement of such needs as prestige, self-respect, autonomy, and self-regard.

Job involvement is afunction of individual differences and the work situations. Thus demographic and work experience variables are expected to relate to job involvement. Positive relationships are associated with age, tenure, years in occupation,education, having children, and gender. There are no strong evidernce for a strong relationship between job involvement and performance (Cohen, 1999). Job involvement and organisational commitment are negatively related to absenteeism, withdrawal intentions and turnover, as well as lateness and leaving work early, whereas it is positively related to work effort and performance (Blau & Ryan,1997). Individuals with higher levels of job involvement and organisational commitment are likely to exhibit less unexcus lateness and unexcused absence than individuals with lower levels of job involvement and organisational commitment (Blau, 1986; Blau & Boal, 1987).

### Organisational Effectiveness

Organisational effectiveness is the central theme of organisation theory. It is a viable concept from the standpoint of management. It is very difficult to conceive a theory of organisation that does not include the concept of effectiveness. Accademicians and organisational scientists unanimously agree to the importance of effectiveness in organisations, and at the same time, there is little agreement among the social scientists as to what the concept really means. The principle reason for the notable lack of consensus of the concept stems from the parochial views that many scientists harbour about the effectiveness construct. For instance, a financial analyst usually equates effectiveness with the rate of return on investment; the number of inventions and introductions may be the criteria of effectiveness for a Research and Development specialist; while job security, job satisfaction and pay levels may be the measuring rods of effectiveness for a labour union

leader. Thus effectiveness can be construed as a semantic jargon and as such, many people have defined effectiveness in terms of single evaluation criterion. For instance :

1. Effectiveness could be defined as the degree to which organisation realizes its goals (Etizioni, 1964,).
2. Organisational effectiveness could be seen in terms of survival of the organisation ( Kimberly, 1979 ,)
3. Organisational effectiveness is the extent to which an organisation, given certain resources and means, achieves its objectives without placing undue strain on its members (Georgopolous & Tannenbaum, 1957,).
4. Effectiveness is the ability of an organisation to mobilize its centres power for action- production and adaptation (Mott, 1972,).

Campbell, Dunnette, Lawler & Weick. (1970 ), reviewed a proliferation of different organisational effectiveness and formed as many as thirty different criteria for measuring effectiveness. However, he concluded that all the thirty criteria cannot be relevant to every organisation, and that since an organisation can be effective or ineffective on a number of different facets that may be relatively independent of one another, organizational effectiveness has no operational definition. Steers (1975) on the other hand, reviewed seventeen different approaches of assessing organisational effectiveness and found a general absence of agreement among them. The four top ranking evaluation criteria in his study are adaptability-flexibility, productivity, job satisfaction, and profitability. Most surpringly, „survival‟ and „growth‟ are least important factors in his study; hence he concluded that there is a little agreement among analysts concerning what

criteria should be used to assess levels of effectiveness. Generally, it could be deduced that:

1. Effectiveness is not one-dimensional concept that can be precisely measured by a single, clear-cut criterion.
2. Effectiveness is a matter of degree; hence no organisation is effective as it could be.

Effectiveness is a label to which an organisation has performed according to its capacities, potentials, and general goals.

Furthermore, Lawless (1972) highlighted the importance of three different perspectives of effectiveness, which includes individual, group and organizational effectiveness. The

relationship among these three perspectives of effectiveness is shown in figure 1.

Organisational Effectiveness (OE)

Group Effectiveness (GE)

Individual Effectiveness (IE)

### Eigure 1: Perspectives of Organisational Effectiveness Source: Lawless (1972)

The perspective of individual effectiveness throws light on the task performance of members of the organisation. The performance is routinely assessed through evaluation techniques that become the basis for pay rise, promotions and other positive rewards in the organisation. Individuals hardly ever work alone or in isolation from others in an organisation; hence another perspective of effectiveness is the Group effectiveness.

Organisation consists of individuals and groups and therefore organisational effectiveness consists of both individual and group effectiveness. Lawless (1972) contended that the relationships among these perspectives vary depending on the type of organisation, the task, and the level of technology used in the organisation. The fundamental task of management is to identify and establish the causes of these perspectives.

Organisational effectiveness is the result of a blend of vast number of variables including technology, environmental constraints, personal competence of the employees and the innovative abilities of the managers , and so on.The causes of individual effectiveness include physical attributes, personality traits, motivation and morale, and so on, while the causes of group effectiveness comprise of leadership, communication and specialization and so on. The causes of organisational effectiveness include technology, environmental conditions, competence and many other variables.

Chester (1938) identified four broad approaches to organisational effectiveness to include the goal attainment approach, system approach, strategic constituencies approach, and the behavioural approach.

The goal attainment approach states that an organisation primarily exists to accomplish goals. Goal attainment seems to be the most widely used criterion of organizational effectiveness. In the words of Chester, “what we mean by effectiveness is the accomplishment of recognised objectives of cooperative effort. The degree of accomplishment indicates the degree of effectiveness”. The assumptions of the goal attainment approach according to Chester include:

* 1. .Organisations have ultimate goals
  2. The goals of the organisation are well defined and properly understood by all the members of organisation.
  3. There must be general consensus on these goals.
  4. The goals must be few enough to be manageable and
  5. Progress toward these goals must be measurable.

The limitation of goal attainment is that it is difficult to apply in those organisations that do not produce tangible outputs. Also, organisations have different goals: short-run, long run, individual and organisational. There are problems of whose goals to consider first and who measures the goals.

System approach to organisational effectiveness implies that organisations are made up of interrelated and interacting elements. The effectiveness of the total system is dependent on the performance of all its sub-parts.The open-system perspective emphasises the inter- relationships between various parts of an organisation and its environment as they jointly influence effectiveness. In the system approach to effectiveness, factors such as inputs- output relationships, flexibility of response of the organiation to changing environment, the efficiency with which transformation takes place in the organiation, communication, job satisfaction etc must be considered. The problem with system approach is that flexibility of response to environment and such qualitative variables defy appropriate measurement.

Another approach to organisational effectiveness is the Strategic Constituencies approach, in which management seeks to appease only that part of environment that can treathen the organisation‟s survival. An effective organisation is one that satisfies the demands of those constituencies in its environment from which it requires support for its continued existence (Pfeffer & salancik, 1978). Strategic constituencies approach assumes that an organisation faces competing demands from various interes groups both within and outside the organisational environment. To see the effectiveness through this approach certain steps must be followed according to Pfeffer & salancik (1978):

1. Management should identify all integral constituencies in the environment on which the survival of organisation depends.
2. The relative power of each constituencies should be evaluated by considering the degree of dependence of the organisation on them.
3. Identify the expectations those constituencies hold for the organisation.
4. Management should then, arrange these constituencies in order of their power and expectations.
5. Organisational effectiveness then would be assessed in terms of ability to satify these constituencies that are ranked. The negative aspect of this approach is that the task to separate strategic constituencies from the larger environment is not easy. Furthermore, it is very difficult to assign the weights to these critical constituencies regarding the dependence of organisations on them.

The fourth approach is called Behavioural approach to organisational effectiveness. This approach emphasises the role of individual behaviour as it affects organisationnal success or failure.When employees agree with the objectives of the organisation/ employer, then it results in perfect integration of the individual and organisational goals. This leads to high degree of organisational effectiveness. To see the organisation survive, management must have adequate indicators. The short-run indicators are production, efficiency, and satisfaction measurement; the immediate indicators include adaptiveness and development.

### Statement of the Research Problem

One of the current challenges which seems to have direct effect on the effectiveness of work organisations (public and private) in Nigeria is safety management. It appears that many organisations in Nigeria have poor safety management practices that do not promote safety consciousness and awareness among employees. Also, it seems there is a general poor attitude to safety consciousness by Nigerian workers, as most employees tend to neglect the precautions for both personal and organisational safety at the workplace. These situations invariably expose workers to avoidable hazards. This observation is informed by the numerous accidents which often lead to injuries and death of workers, thereby implicating the inefficiency and ineffectiveness of work organisations in Nigeria.

From studies conducted on accidents in the USA (Endsley, 1995a, 1998 & 2000), two major safety factors have been identified in the organisations. They are: Situation Awareness (SA) and Safety Management Practices (SMP). In Nigeria, these factors not only seem to affect the lives and health of the employees, but also their general effectiveness in the organisations.

Furthermore, available literature show absence of proper instruments to assess employees‟ safety and situation awareness, including the nature of safety management practices in Nigerian organisations. Notable instruments so far from the literature are Offshore safety questionnaires (Rundmo, 1994) and Safety management test (Mearns , Whitaker & Flin, 2003), which are not indigenous and particularly designed for measuring safety in offshore oil and gas installations. Therefore, there is the need to develop proper and adequate safety instruments that would take into consideration accident-prone public and private sector organisations; and the peculiarity of work environment in Nigeria.

Globally, some studies have established relationships between safety and other organisational variables such as productivity (Diaz & Cabrera, 1997); commitment (Crover, 1990; Zeffane, 1994); and job involvement (Simard & Marchand, 1995 & 1997).

Furthermore, studies have established associations between effective performance and commitment (Angel & Perry, 1981); effective performance and crime prevention (Johnson & Schnech,1982); effectiveness and institutional characteristics (Cameron, 1981); and effectiveness and job involvement (Schein,1990). Similarly in Nigeria, such studies include: effectiveness and financial performance (Okike, 1986); and effectiveness and commitment (Gbadamosi, 1985).

However, no known study has established relationships among situation awareness, safety management practices and effective performance (commitment, involvement and general effectiveness) in Nigerian organisations. Furthermore, no past study has established the relationship between situation awareness and other variables like gender, cadre and organisational type in Nigerian organisations.

This study therefore intends to fill these gaps by developing two psychological instruments that can be used not only to assess employees‟ situation awareness and safety management practices, but also to predict organisational effectiveness in accident-prone Nigerian organisations. This would invariably minimize the rate of accidents and hazards, and as well encourage effective work performance in the organisations.

### Objectives of the Study

The general aim or purpose of this study was to develop two psychological instruments (Safety management practices test and situation awareness test) that would assess organisational safety and employees‟ situation awareness respectively; and also predict effective performance of workers in accident-prone Nigerian organisations. Specifically, the objectives of the study are to:

1. develop two valid and reliable psychological instruments for assessing safety management practices (SMP) and situation awareness (SA) in accident-prone Nigerian work organisations.
2. investigate the relationships between situation awareness and safety management practices in the selected Nigerian work organisations;
3. determine how situation awareness and safety management practices would predict effective performance (commitment, involvement and general effectiveness) of workers in the selected Nigerian organisations;
4. compare the differences in situation awareness between the selected Nigerian public and private sector organisations;
5. determine the differences in safety management practices between the selected Nigerian private and public sector organisations.
6. examine gender differences in situation awareness among the employees of the selected Nigerian work organisations; and
7. assess organisational cadre differences in situation awareness.

### Research Questions

This study has the following research questions:

1. Will there be significant positive correlations between situation awareness and safety management practices in the selected Nigerian work organisations.

2a. Will the level of situation awareness and proficiency level of safety management practices in the selected Nigerian organisations, significantly predict workers‟ commitment to their organizations?

2b. Will the level of situation awareness and proficiency level of safety management practices in the selected Nigerian organisations, significantly predict workers‟ job involvement in their organizations?

2c. Will the level of situation awareness and proficiency level of safety management practices in the selected Nigerian organisations, significantly predict workers‟ effective performance in the organizations.

1. Will the employees of the selected private sector organisations in Nigeria significantly score higher on situation awareness than those of the public sector organisations?
2. Will the selected private sector organisations in Nigeria significantly score higher on safety management practices than the public sector organisations?
3. Will the male employees in the selected Nigerian work organisations significantly score higher on situation awareness than their female counterparts?
4. Will the middle cadre employees in the selected Nigerian work organisations significantly score higher on situation awareness than their junior and senior cadres?

### Research Hypotheses

The following hypotheses were formulated for statistical testing:

1. There will be significant positive correlations between situation awareness and safety management practices in the selected Nigerian work organisations.
2. a. The level of situation awareness and proficiency level of safety management practices in the selected Nigerian organisations will significantly predict workers‟ commitment to their organisations.

2b. The level of situation awareness and proficiency level of safety management practices in the selected Nigerian organisations will significantly predict workers‟ job involvement in their organizations.

2c. Situation awareness and proficiency level of safety management practices in the selected Nigerian organisations will significantly predict effective performance of workers‟ in the organizations.

1. The selected employees of the private sector organisations in Nigeria will significantly score higher on situation awareness than those of the public sector organisations.
2. The selected Nigerian private sector organisations will significantly score higher on safety management practices than the public sector organisations.
3. Male employees in the selected Nigerian organisations will significantly score higher on situation awareness than their female counterparts.
4. The middle cadre employees in the selected Nigerian work organisations would significantly score higher on situation awareness than their junior and senior cadres.

### Significance of the Study

This study is relevant in the following ways:

1. Safety need is an important factor in organisational management; therefore, studying the concept would enable organisational managers to know how it affects employees‟ behaviour and organisational effectiveness.
2. The implementation of the findings of this study would encourage proficiency in safety management practices and high employees‟ situation awareness. These would help organisations to achieve employees‟ positive outcomes, high commitment, involvement and organisational effectiveness.
3. The developed instruments on employees‟ situation awareness and safety management practices in Nigerian organisations would help to proffer solutions to safety problems in organisations, thereby minimizing the rate of industrial-organisational hazards.
4. Situation awareness test developed in this study could be used by the human resources managers in screening applicants for recruitment and placement in the organisations, so as to avoid the employment of accident-prone persons.
5. The study identified the particular level of situation awareness, in which accidents occur frequently in the organisations. This would enable organisational managers in Nigeria to efficiently and effectively direct/ utilize their limited resources in the area of need for prevention of accident.
6. Findings from the study would help safety managers and experts in organisational behaviour in Nigeria to formulate and administer effective safety policies, regulations and standards in their organisations.
7. The present study would open up new vistas in similar fields that would inform further research in institutions of higher learning.

### Scope and Delimitations of the Study

This study covers selected Nigerians within the ages of 18 to 59 years working in public and private organisations in Lagos State. As Lagos is the commercial and administrative nerve center of Nigeria, the research sample taken from it is therefore a good representative of Nigerian workers. Apart from the geographical scope, the study was also limited to both demographic and psychological factors such as gender, cadre and organisational type. Safety management practices and situation awareness tests were used to assess safety and predict effective performance (commitment, involvement and general effectiveness) in the selected organisations.

Twenty-six public and private organisations that are patently accident-prone were selected for the study. The sample cuts across married and unmarried persons from major and minor ethnic groups, and different religions in the country. Finally, their educational qualifications ranged from school certificate to Ph. D degree.

### Operational Definition of Terms

This study used the following terms in the sense defined below:

**Accident:** a chain of events and circumstances leading to unintended injury. Also, it is an unpleasant and unintended happening sometimes resulting from negligence, which may result in damage, loss or injury serious enough to require medical attention. It is also an

unplanned event which occurs within a planned programme and is actually or potentially harmful to an employee. It could be an indicator of insecurity and ineffectiveness in an organization or enterprise.

**Safety:** a perceived condition free from hazards or accidents in any environment. It is relative because there is no accident-free environment in practice. Occurrence of accidents can only be minimized or prevented through a process of effective safety management.

**Safety management:** management of risk of accidents.

**Risk:** an existing condition of potential hazard capable of causing injury or death to persons and/or destruction of property in any environment.

**Safety Climate:** the condition or feeling that exists in an environment or a surrounding, especially at a particular time regarding its safety; or the mental feeling, atmosphere, environment, or attitude of a body of people with respect to safety. This involves employees‟ satisfaction with safety activities, involvement in health and safety, communication about health and safety, perceived supervisors‟ competence, perceived management commitment to safety, frequency of general unsafe behaviour and frequency of unsafe behaviour under incentives. It is a manifestation of safety culture in the behaviour and expressed attitude of employees.

**Safety Culture:** the assembly of characteristics and attitudes of individuals in organisations, which establishes an over-riding priority, warranted by their significance. Safety culture forms the context within which individual safety attitudes develop and persist. Most definitions of safety culture invoke shared norms or attitudes so that the level of aggregation is considered to be the group.

**Predictors:** things, situations, events or behaviour which determine, influence or predict the occurrence of another behaviour or event. For instance, positive safety factors would positively influence, determine or predict employees‟ organisational commitment and effectiveness, and vice versa.

**Validity:** the extent to which a test actually measures the characteristics or the behaviour domains which it intends to measure. It refers to whether a test can be used in making accurate decisions or predictions.

**Test Validation:** a scientific process of determining the validity of a psychological test. As a process, it goes through stages. It is also the scientific inquiry into test score meaning. Researchers are of common opinion that all validation strategies are designed to pursue the same basic goal of understanding the meaning and implication of test scores.

**Reliability:** how accurate and dependable a measurement made is.

**Standardization:** uniformity of procedure in administering and scoring a test. For instance, if the scores obtained by different persons are to be compared, testing conditions must obviously be the same for all. This is a special requirement for controlled condition in all scientific observations. Here, the statistical norms computed from the obtained test scores provide a frame of reference of interpreting scores made by people who subsequently take the test.

**Situation Awareness (SA):** the perception of an element in the environment within a volume of space and time, the comprehension of its meaning, and the projection of its status in the near future.

**Safety Management Practices (SMP):** actual practices, roles and functions associated with human and organisational survival. It involves what an organization should be doing to protect its workers, customers, the public and the environment from harm.

**Organisation:** a group of people with different qualifications, skills, knowledge, experience, attitudes and personality traits, working as a team, and guided by rules and regulations for the purpose of achieving both individual and organisational goals and objectives. The concept of organization deals with the relationship between the organisational members (employees and management) and the work situation. It is also the process of identifying and grouping the work to be performed, defining and delegating responsibility and authority, and establishing relationships for the purpose of enabling people to work together effectively to accomplish objectives.

**Organisational Commitment (OC):** the extent to which a worker is affectively attached to the achievement of the goals and values of an organization, with particular emphasis on the role the worker selflessly plays in the process of the achievement. The three components of organisational commitment include: (a) identification [b] job involvement and (c) loyalty.

**Job Involvement:** the degree to which a person is identified psychologically with his work, or the importance of his work to his total self-image. It is also a situation in which one is psychologically immersed in work-role activities of his/her organization.

**Organisational Effectiveness (OE):** the degree to which an organization realizes its goals through cooperative efforts of its members and stakeholders. It is the extent to which an organization, given certain resources and means achieves its objectives without placing undue strain on its members due to hazards.

## CHAPTER TWO LITERATURE REVIEW

A thorough understanding of this study necessitates a review of several relevant theories. These theories in no small measure serve as the theoretical framework of the study. The theories are: (1). Maslow‟s hierarchy of needs theory; (2). Cognitive social learning theory; (3). Situation awareness theory; (4). Safety management theory; (5). Accident theory of social threshold; (6). Adjustment-to- stress theory; (7). Goal-freedom –alertness theory; (8).Accident statistics theory; (9). Individual –factor theory and (10). Accident - proneness theory. Also, this chapter reviews empirical studies, which cover the dimensions of this study, thereby revealing previous findings in similar field that broadens knowledge on the subject matter.

### Theoretical Review

The above theories are reviewed in this section as follows:

### Maslow‘s Hierarchy of Needs Theory

Maslow (1943) postulates that all human needs are classified into physiological needs, safety needs, social needs, esteem needs and self-actualization needs. He arranged these needs in a hierarchical structure, whereby the lowest in order of necessity are the physiological needs, followed by safety needs, social needs, esteem needs and self- actualization needs in ascending order. The satisfaction of these needs progresses upward for the individual from basic ones (physiological needs like food), to the next level on the ladder until the last on top when he/she attains fulfillment. However, the inability to satisfy any of the needs serves as motivation to accomplish the goal of that satisfaction.

Self- Actuali- zation

Esteem Needs

Social Needs

Safety Need

Physiological Needs

Figure 2: Hierarchy of Needs Theory Source: Maslow (1943)

Safety need occupies the second step on the ladder, making it an essential need of every individual. Safety needs are primarily security from hazards of life, danger, deprivation and threats imposed by the working environment, fellow employees or management. The need for security dominates the mind of a man who feels threatened.

A key assumption in this study therefore is that a man whose safety needs are adequately guaranteed in his work place will feel safe and secured; hence he will be motivated, committed, involved and effective in the performance of his duties. This is a major premise upon which this study examines how employees‟ safety needs would impact on their effective performance in their organisations.

### Cognitive Social Learning Theory

The early works of Ivan Pavlov, Skinner and John Watson gave rise to cognitive social learning theory, but was however, credited to Albert Bandura who was named after the theory (Bandura, 1977). It states that the most important parts of people‟s behaviour are

learned from other persons in the society such as family, friends and larger cultural

society. By implication, people are seen as playing active roles in determining their own actions, rather than being passively acted upon by the learning environment. According to Oborne (1982), one model of causes of accidents was based on social learning theory. He postulated that safe behaviour is often not reinforcing because it is more time-consuming, requires special equipment and procedures, and is sometimes regarded as „unmanly‟ by other workers. Furthermore, that safe behaviour is reinforced only when an accident occurs as a result of unsafe behaviour. However, accidents do not often occur enough to promote safe behaviour. Unsafe behaviour on the other hand, can be reinforcing because it is quicker, more comfortable, and more socially acceptable.

Generally in Nigeria, it seems a good number of workers prefer less time consuming work, more comfortable, easier and quicker way of doing work to the opposite. This attitude has the negative effect of not taking into cognizance the expected safe working practice required to avoid accidents/hazards in the organisations. This is because the patience required in following procedures and regulations necessary for safety is ignored. Although, it might result to increase in turn over of productivity as management would always prefer, but safety in this kind of situation is considered secondary. The results most often are industrial accidents and hazards.

In organisations where productivity takes priority over safety, managements hardly discourage workers from any unsafe-work attitude or practice that seems to increase output. However, they seem not to hesitate in blaming or punishing workers when such unsafe practice leads to accident or hazard. Also, managements seem to prefer seeking for solutions when accidents have already occurred, to preventive measures for all forms of accidents that are likely to occur in the organization. This kind of managerial approach to safety management, hardly encourage efficient and effective safety management in an

organization. This would also have adverse effects on the general effectiveness in the organisational performance.

### Situation Awareness

Situation awareness, according to Jones and Endsley (1996), is “the perception of the elements in the environment within a volume of space and time, the comprehension of their meaning, and the projection of their status in the near future”. On the other hand, Adam, Tenney and Pew (1995) described the concept as “the up-to-date minute cognizance required in operating or maintaining a system”. These definitions are the most widely accepted and often cited as appropriate and accurate description of the concept. Situation awareness (SA) therefore, is the ability to successfully pay attention to and monitor the environment, and anticipate risky and accident-prone situations. This is a vital factor in ensuring a safe working environment. The goal of situation awareness is to make those concerned aware of their surroundings, so they can react to and anticipate events and actions. It is when Situation awareness fails that accidents occur (Jones & Endsley, 1996; Endsley, 2000b).

Safety at personal and organisational levels should be a concern of every individual who works in an organization. Employees should be perceptive, comprehensive and proactive about possibilities of the accidents and other hazards in their jobs and organisational environment. This would engender in them a better attitude towards safety at work and avoidable accidents would be reduced to a minimum. By so doing, efficiency and effectiveness are encouraged as workers would be more committed and involved in their duties, hence higher productivity.

Endsley (2000b) stated that situation awareness operates at three different levels: Level 1 perception, Level 2 comprehension, and Level 3 projection.

### Level 1 SA: Perception

This is the basal constituent of situation awareness. It involves the perception of essential elements in the environment. Without an accurate initial perception of the relevant elements in the environment, it is unlikely that an accurate idea of the situation could be formed. This increases the likelihood of an error or accident, since the fundamental components on which the later stages of SA are inaccurate.

### Level 2 SA: Comprehension

This involves the comprehension, interpretation, storage and retention of the perceived information to conceptualize the situation, because the significance of the objects/events is understood (Stanton, Chambers and Piggott, (2001). This implies, essentially that meaning has been derived from the elements perceived. The degree of comprehension that is achieved will vary from person to person. According to Endsley (1995a; 1995b & 2000a), the level attained is an indication of the skill and expertise of the operator.

### Level 3 SA: Projection

This is the final level which occurs as a result of the combination of levels one and two. This stage is very important because it involves possessing the ability to use information from the environment to predict possible future schedules and events (Endsley, 1988; Sarter and Woods (1991). Having the ability to correctly forecast probable/future circumstances is vital to taking the best decisions on appropriate courses of action, because there will be enough time to dispel potential discords and formulate a suitable course of action to meet goals (Stanton, et al (2001).

Dalrymple & Schiflett (1997) described situation awareness as humans responding appropriately to important informational-behavioural cues. This definition contains four key elements: (1) humans, (2) important informational cues, (3) behavioural cues, and (4) appropriateness of the responses. Important informational cues refer to environmental stimuli that are mentally processed by humans. The appropriateness of the responses is measured /assessed by comparing the response with an expected response, or a number of possible expected responses. The expected responses form the basis for a performance measure of situation awareness.

Endsley (1995b) stated that “situation awareness provides the primary basis for subsequent decision making and performance in the operation of complex and dynamic systems”. He believes that at its lowest level, the operator needs to perceive relevant information (in the environment, system, self. etc.); next, to integrate the data in conjunction with task goals; and at its highest level, to predict future events and states of the system based on this understanding. Taylor (1990) defined situation awareness as, “the pre-requisite state of knowledge for making adaptive decisions in situations involving uncertainty”. He further stated that situation awareness is the knowledge, cognition and anticipation of events, factors and variables affecting the safe, expedient and effective conduct of the mission.

Furthermore, Billings (1995) defined situation awareness as “an abstraction that exists within our minds, describing phenomena that we observe in humans performing work in a rich and usually dynamic environment”.

On the other hand, Carol (1992) explained the concept using the relationship between the pilot and the aircraft. He defined it as, “a pilot‟s continuous perception of self and aircraft in relation to the dynamic environment of flight, threats, and missions, and the ability to

forecast, and then execute tasks based on that perception”. For Carol therefore, Situation awareness is a problem solving in a three-dimensional spatial relationship complicated by the fourth dimension of time compression, where there are too few givens and too many variables. He argues that situation awareness encompasses the individual‟s experience and capabilities, which affect the ability to forecast, decide and then execute.

From Carol‟s argument, one can deduce that situation awareness represents the cumulative effects of everything an individual is and does as applied to the accomplishment of a mission.

Some scholars like Emerson, Reising & Britten-Austin (1987), Endsley (1988), and McMillan (1994) equally defined the concept from the same perspective of pilot-aircraft relationship. For instance, Emerson et al (1987) opined that SA is like “the crew‟s knowledge of both the internal and external states of the aircraft, as well as the environment in which it is operating. The internal state of the aircraft refers to the „health‟ of its utility systems which must be monitored, while the external environment refers to the terrain, threats, and the weather”. Situation awareness has been likened to risk- awareness, which is developed in the organisations through programmes that encourage workers to undertake a risk assessment in their minds before commencing work (Hopkins,2002; 2005a; 2005b; 2006 & 2007) . According to him, “risk-awareness programmes as cultural approach to safety, rely not only on individual risk-awareness, but on organisational systems that encourage risk-awareness”(Hopkins, 2005a & 2007). Risk- awareness as situation awareness is a cultural approach to safety and also a form of risk assessment, which has been variously referred to as „informal risk assessment on day- to- day task‟ (Joy & Griffiths, 2005), „informal/mental risk assessment‟( Australian Coal

Association Research Programme, 2007) and „last minute risk assessments‟ (Gillette et al., 2004). There is the belief that what makes risk-awareness programmes a form of risk assessment is that risk-awareness programmes encourage workers to stop and think before starting work, so that they may identify hazards and take action to control the associated risks.

In this study, the researcher by Varimax rotation method also identified three principal component factors of situation awareness. While Endsley identified perception, comprehension and projection as three component factors of situation awareness, this study however identified perception and attitude as two separate factors, but merged comprehension-projection as single and third factor. The researcher explains that one‟s attitude towards what he perceives, determines his comprehension-projection status.

Generally, when proper perception, rightful attitude towards the perceived element and adequate comprehension-projection are made on issues relating to work performance in an organization, efficiency and effectiveness are certain in terms of safety, productivity and organisational survival. These outcomes are considered very important to this study.

### Safety Management Theory

The theory of safety management is associated with Kirwan (1998). He defined safety management as “the total activities conducted in a more or less coordinated way by an organization to control the hazards presented by its technology”. According to him, an organization should be able to identify what it does to protect its workers, customers, the public and the environment from potential hazards associated with its operation. It is by so

doing, that organisational members, the environment and the general public would be considered safe, since accidents and hazards would be minimized. However, if these activities or functions are not carried out by the organization, the probability of accidents and hazards occurring would be high.

The “necessary attitudinal ingredients for proficient safety management in any organization include commitment, involvement, care, trust, alertness, openness to learning and priority for safety” (Kirwan, 1998). These activities if actually carried out by the organisations should reveal the information about their contributions to employees‟ safety awareness, employees‟ good safety behaviour, general reduction of accidents and hazards in the organisations, and general organisational effectiveness /performance. It is important to note therefore that all these variables among others have been directly or indirectly manipulated in the present study.

Besides, the nine component factors extracted during factor analysis of the SMPQ instrument developed in this study by varimax rotation method with Kaiser Normalization are the functions, roles or activities expected of any organization with proficient safety management practices. When management carries out these activities, the information regarding effectiveness in both safety and the general organisational performance is revealed. This is in agreement with Kirwan‟s postulation. Consequently, this study among other things aimed at assessing the safety management practices in both public and private organisations in Nigeria. This was done by examining and comparing how these activities are carried out in the selected accident-prone organisations.

### Accident Theories

In view of this study‟s concern with safety management and its impacts on organisational effectiveness in Nigeria, a review of some theories on accidents is necessary. Accidents often occur in organisations; however, their causative factors are more critical because they make organisational environment unsafe for employees. Consistent occurrences of accidents in an organisation often leave employees uncommitted and ineffective. To surmount the problem, management and workers must ensure that positive attitude that would encourage safe operation is enhanced in the organization. The organisational climate must permit safe working practices.

The accident theories reviewed in this study include: Theory of Social threshold, adjustment-to-stress theory, arousal-alertness theory, goal-freedom-alertness theory, accident statistics, individual factor and accident proneness theories.

### Accident Theory of Social Threshold

Paterson (1950) made significant contributions to accident proneness through his sociological theory. He classified the causative factors of accidents into three groups:

1. Individual (Intrinsic),
2. Social (Extrinsic), and
3. Natural.

In his sociological postulations, he stated that certain individuals become accident-prone only under “propitious social conditions”. Furthermore, he observed that social stress may produce emotional changes in the individual which would interfere with his ability to act in a safe manner. According to him, a social threshold exists beyond which the individual

becomes temporarily accident-prone. Paterson believes that these thresholds are established by the social group in line with its accepted patterns of safe and unsafe behaviour. Repeated accidents therefore might be a symptom of individual deviation from a group‟s norm of safe behaviour.



Threshold

D

C

Q

X

Y

P

N1

Max.

N

Min.

Conditioning

**Figure (3):** Accident Theory of Social Threshold

Population

**Source:** Paterson (1950).

The social threshold of accident possibility at any given moment may bear a relationship to the curve of behaviour C, as shown above. Beyond this threshold, these individuals within area P are deviants from the norm N, who are more accident-liable if the other half of the social interaction involved is a similar deviant. An individual within the area Q who is more strongly conditioned will conform more closely to the rules of the road and will be less accident-liable. Sote (1984) noted that this situation is dynamic .In his explanations,

he illustrated as follows: Individual X in region Q, may be translated into region P, through being distracted by conversation in his car by his passenger. On the other hand, an individual Y in region P, who has been driving tempestuously owing to a quarrel with his wife, may calm down and conform to the norm of behaviour, thus moving into Q. These are said to be immediate and internal social factors.

Paterson‟s theory of social threshold has been found to be scientifically deficient. For instance, Haddon, et al (1964) argued that Paterson‟s assumption of social conditioning is always aimed at decreasing the possibility of an accident is unreasonable. He also argued that the concept of a social threshold or cutting point on a normal curve of behaviour seems unlikely to prove either valid or useful. It is therefore doubtful if such a threshold would be an all-or-none type, with individuals being safe up to the threshold and unsafe beyond it.

Sote (1984) criticised Paterson‟s sociological theory of accidents for failing to analyse other accidents that occur as a result of deviant behaviour emanating from the worker‟s disobedience to constituted authority. He illustrated this with an example, where the worker refuses to wear the shoes to work as required in the factory or disregards the rule of wearing hand gloves and protective goggles while welding with carbides and electrodes in the factory.

The researcher of the present study also noted that, although Paterson‟s theory of social threshold has made some remarkable impacts in understanding the possibility of occurrence of accidents and safety consciousness, but his use of terms like mores, norms, and deviance is extremely loose, and the concepts are inadequately defined.

### Adjustment-To-Stress Theory

This theory states that accidents occur more frequently when workers are experiencing psychological or physiological stress (Kerr 1957). Sote (1984) explained that the proneness of young accident repeaters is largely associated with adjustments to work discipline, attaining self-sufficiency away from parental ties, courtship, and marriage and so on. It is not surprising therefore that many young people nowadays get involved in organisational accident. This is so because of their curiosity/desire to make quick money to live on the „fast lane‟. This urge often induces them to engage in unsafe work attitudes by „cutting corners,‟ or indulging in „sharp practices‟, worrying a lot, getting into multiple projects/jobs, lost of concentration and so on.

In agreement with Sote‟s view on young accident repeaters, the researcher is of the opinion that regular counseling of organisational workers by industrial /organisational psychologists/human resources managers would effectively help in managing those issues that usually cause stress in workers. This would invariably reduce the rate of accidents and hazards in organisations.

### Goal-Freedom-Alertness Theory

Sander & McCormich (1993) stated that, “workers who have the autonomy to set realistic performance goals are less likely to have accidents”. In this case, when workers know their goals and targets, they are able to plan in advance and gradually work towards the achievement of the set goals and avoid the pressure of meeting their targets in a hurry. Such hurry obviously leads to tension, anxiety and stress, which would invariably cause accidents and hazards in organisations.

In this study, the researcher identified work-place anxiety as one of the principal component factors of organisational effectiveness during factor analysis. He also noted that work-place anxiety correlated negatively with thirteen safety variables and job involvement in the study. Furthermore, it has very low positive correlations with organisational commitment and general organisational effectiveness. Consequently, anxiety has an implication of causing accident and ineffectiveness in organisations. Organisational managers, who issue out emergency policies and involve their workers in production pressure to meet market demand or target most often, seem to create anxiety in them. Also, managers who threaten their workers with sack letters, query, and so on, equally seem to induce anxiety in them. This category of managers seems not to allow their workers to have the necessary autonomy in setting their goals and targets, as well as working towards the targets without pressure. This is counter productive and should be avoided in Nigerian organisations.

### Accident Statistics theory

This theory states that the total number of accidents in a particular activity is a product of how dangerous the activity is (that is, the risk and the frequency at which people are exposed). It states that “the easiest way of reducing accidents of a particular kind is to reduce people‟s exposure to the situation which produces it” (Mackay, 1967).

The researcher of this study observes that this particular explanation is inadequate in the production sector. For instance, in the factories people constantly work and operate machines to ensure high productivity. Therefore, if accidents frequently occur as a result of faulty machines, it is better to repair or replace the machines instead of restricting

people from operating them . Only restriction of exposure to the machines would result in low productivity. It is however better to identify their causes, i.e. whether the machines are faulty, so that a lasting solution can be sought and implemented, while regular operation and high productivity are maintained. In doing so, efficiency and effectiveness are achieved towards the organisational goals. As a matter of fact, the statistics theory of accident would be better applied with children and any form of accidents in particular, rather than with employees and industrial-organisational accidents.

### Individual Factor Theory

This theory states that, “If it is the case that human error is an important cause of accidents, we should be able to demonstrate that some people are more likely to have accidents in some circumstances; example, when they are angry, tired, inexperienced or untrained. The relative importance of these factors has to be related to different remedial measures (Howarth & Gillham, 1981).

### Accident Proneness Theory

There is a belief that some people are “accident prone”. This idea was first introduced as early as 1919 by statisticians who studied accidents in munitions factories in England during World War I. The researchers found that a small minority of workers had the majority of accidents. However, most researchers contend that evidence on the accident- prone worker does not bear up under scrutiny. Although, there may be some individuals who have more accidents than others, it may be more connected to the kind of work they do, rather than their peculiar characteristics. For instance, Porter and Corlett (1989)

discovered that individuals who considered themselves accident-prone pay less attention to their environment when performing particular tasks.

Porter and Corlett believed that accident-prone persons are so because they either do not pay attention to their environment when performing their tasks, or that the management is unconcerned in the improvement of their safety awareness.

In this study, safety training is seen by the researcher as an aspect of safety management practices which can be used by management to improve the knowledge, skills and abilities (KSA) of employees towards safe working behaviour in their various operational bases. Training therefore, provides solution to individual factor and accident-proneness theories. Indeed, training eliminates the „proneness‟ of workers to accidents and improves their general attitude to safety consciousness.

Generally, the five theories adopted for this study are (1) Maslow‟s Hierarchy of Needs,

(2) Social Learning Theory, (3) Situation Awareness Theory, (4) Safety Management Theory, and (5) Goal-Freedom–Alertness Theory of Accidents.

### 2 Review of Empirical Studies

Major empirical studies covering the scope of this study are reviewed as follows:

### Situation Awareness Studies

A research conducted by Sneddon (2004) on the accident database of a multinational oil company in the period between January and October 2003 revealed 332 incidents. A total of 135 incidents that related to situation awareness (SA) errors were analyzed and classified using the taxonomic approach of Jones and Endsley (1995; 1996). The overall results showed that 66.7% were classified as Level I SA errors; 20% were level 2 errors

and the remaining 13.3% were level 3 errors. Sneddon concludes that the drilling accidents attributable to SA errors had the vast majority of 66.7% due to errors in level I SA (failure to perceive correctly), followed by 20% errors in level 2 SA (failure to comprehend correctly) and 13.3% errors in level 3 SA (faulty projection).

In a review of military aviation mishaps, Endsley (1999) discovered that problems with situation awareness were the leading causal factors. He also discovered that 88% of accidents among major air carriers, involving human error could be attributed to SA. Having the ability to correctly forecast probable future circumstances is vital to taking the best decisions on appropriate courses of action. Situation awareness has parallels with the purpose of risk-awareness programmes, because it elaborates the cognitive processes associated with achieving awareness. Borys (2009) noted that the three levels of situation awareness can be applied successfully to better understand how individuals can act with heightened awareness of risk.

Fagbohungbe (2009) stated that “employees are the most vulnerable victims of

occupational safety and health hazards in any organization. This is because they carry out the operations that directly produce goods and services. They are therefore exposed to the danger of machines, chemicals, heat, cold, computer screens and so on”. He observes further that even though it is not the responsibility of the employees to put in place safety and health measures, they become stakeholders through direct involvement in the operational procedures. Fagbohungbe therefore suggested among other things, some self and situation awareness clues that employees should adhere to for their personal safety and reduction of health hazards in organisations. Some of these clues are:

1. Employees must be technically competent.
2. They must have self confidence.
3. They must be aware of their perceptual thresholds. It is at that point that sensation becomes perceivable by individuals. It also influences the individual‟s reaction time.
4. They must promptly report “just noticeable difference” in the performance of equipment or machines.
5. They must identify dangerous work related behaviour and avoid them.
6. They must avoid working beyond their physiological limits in order to avoid physical/mental fatigue.
7. They must not be hasty in performing their tasks on the job.
8. They must avoid the use of faulty equipment.
9. They must avoid the use of drugs with sedative effect at work.
10. They must properly protect their bodies when handling dangerous chemicals.
11. They must avoid smoking cigarettes near inflammable materials etc.

Authors have raised arguments about how an individual acquires and maintains the appropriate level of situation awareness. Dominguez (1994) argued that SA involves the extraction of information from the environment, and the integration of this information with relevant internal knowledge to create a mental picture of the current situation. Such mental pictures are of interest to the present study as they are used to direct further exploration in a continual perceptual cycle, the result of which is used to anticipate future events. Thus, the essential concept within Dominguez‟s understanding of situation awareness is that the process of SA acquisition and maintenance is active and cyclical.

While it is clear that the process of SA acquisition and maintenance is reliant on an active and cyclical process, some authors however, posit that this process is also adaptive. For instance, Neisser (1991) formulated the concept of a „Perceptual Cycle‟, while the interaction between human and environment shapes the human‟s perceptions and actions. Neisser argued that “the structure of our knowledge and expectations of some aspects of the world (schema) are always activated, but that the activation of particular schemata is as an oriented response to the environment. This oriented response selects new information for attention that in turn activates appropriate schemata and so on”. Taylor (1996) argues that neisser‟s Perceptual Cycle presents “a description of SA whereby human attention and awareness of the environment or situation are actively modified by the changing appreciation of information gleaned from that environment”.

From Taylor‟s arguments, the researcher deduced that human attention and awareness of the environment (SA) is not static but dynamic, consistently modified and activated by the environmental features. One of the basic methods of attention and awareness modification is systematic sensitization as conceptualized in the PSM model of this study for situation awareness in organisations.

### Safety Management Practice s

Safety Management is defined as the total activities conducted in a more or less coordinated way by an organization to control the hazards presented by its technology (Kirwan, 1998). These hazards may pose a potential harm to its assets (like damage to buildings, plants, materials and so on.), its workforce, its customers, or those living around the company site. The broad view of hazards here includes not only the acute risks of physical damage, death and injuries, but also the long-term health risks of occupational

disease and exposure to poor working conditions. Safety management practices therefore are concerned with the actual practices, roles and functions of the organisational management towards remaining safe.

Safety management should be seen as a system and not as a sub-system of the organization.It is obviously not a case where there should be one management system which controls production and quality among other things and then an add-on part that caters for safety. Many companies or work organisations in Nigeria seem to adopt this wrong approach by giving the tasks of achieving safety to a separate safety department or safety officer, on who the staff of the organization leaves the whole responsibility to. Safety management only works when it is seen as an integral aspect of the task of all those working in and for the organization. The work of a separate safety department is to coordinate, monitor, and evaluate the safety management system (SMS) and its performance. Individuals at work determine the occurrence of hazards both consciously and unconsciously on a continual basis by their individual behaviour. This approach is labeled safety management. This provides the structure of a safety management system, with allocation of responsibility for specific actions of risk analysis, control and monitoring, which can be documented, explained to others and assessed.

However, safety management is more than simply a structure rationally fulfilling a control function. For it to work effectively, it requires attitudes like commitment, involvement, care, trust, alertness, openness to learning and priority for safety.

Several studies have been done on safety management practices, among which are reviewed as follows:

### Safety Policies

A significant number of studies on safety policies and procedures in organisations have been associated with better safety outcomes. These studies include those on work planning and organization (Cohen, Smitt & Cohen 1975; DeMichiei, Langton, Bullock & Wiles, 1982); Selection, promotion and training (Cohen et al, 1975; DeMichiei et al, 1982; Smith, Cohen, Cohen & Cleveland, 1978); accident investigation and record keeping (Gaerthner et al, 1987; Simonds & Shafai-Sharai, 1997; Gaerthner, Pfeifer & Stefanski, 1976); reduced turnover and absenteeism (Cohen et al, 1975; National Academy of Science [NAS], 1982); use of praise, rewards and avoidance of blame (Alexander et al, 1995; Eyssenck., Hofmann & Spengler, 1980); safety programme development (Cohen and Cleveland, 1983; Simard & Marchand, 1994; Hopkins, 2005a & 2006)); safety rules and procedures (Lee, 1998; Mearns, Flin, Gordon & Fleming, 1998; Hopkins, 2005b); application of common sense principle (Gerber, 2000 & 2001; Somerville and Abrahamsson, 2003; Laurence, 2005); principles of collective mindfulness (Weick and Sutcliffe, 2007); and legislative changes upon safety (CRWEBL, 2000). In various ways, these studies have shown positive outcomes from managements‟ forms of safety policies for organisations, which are supportive to the workforce.

### Leadership Style and Safety Management

Flin & Yurkle (1998) and Yurkle (1999) investigated the association between the perceived leadership style of senior managers using the MLQ (Bass and Avolio, 1995) and safety performance of their units. Results revealed that two elements of transformational leadership style (intellectual stimulation and idealized consideration) and one element of

transactional leadership style (contingent reward) were significantly associated with lower accident rates.

Another study focused on whether conventional theories of leadership, such as Bass (1985), and transformational model measured by the MLO (Multifactor Leadership Questionnaire), would offer an insight into key leadership skills for influencing safety initiative and compliance with rules at the workplace. The result showed that the need to empower subordinates and develop a sense of identity with what goes on in the organization reflects the principles of person-centered, participative, supportive and trusting relationships. Furthermore, it appears to incorporate dimensions which are likely to be influential on safety. For instance, there was an emphasis on values and emotions to explain how leaders can encourage their followers to make personal sacrifices, be committed to ideological objectives, and strive to achieve much more than they initially believed was possible.

Nonetheless, Bass‟ theory is a general one and was not designed to measure leadership behaviours that are identified through empirical research, which would have made it specifically related to safety. Yurkle (1999) criticized the label, “full range leadership theory,” which Bass (1996) used in describing the theory. However, there is recognition that no single theory can be expected to include all aspects of leadership. The MLO lacks scales on several aspects of leadership, i.e. task behaviours such as planning, clarifying, and relations behaviours such as team building networking, change orientation behaviours, participative leadership behaviours, and group and organisational processes, some of which appear related to safety.

### Safety Climate and Leadership

Safety climate could be described as the condition of feeling that exists in an environment or a surrounding especially at a particular time regarding its safety; or, the mental feeling, atmosphere, environment, or attitude of a body of people with respect to safety. This involves employees‟ satisfaction with safety activities, involvement in health and safety, communication about health and safety, perceived supervisors‟ competence, perceived management commitment to safety, frequency of general unsafe behaviour and frequency of unsafe behaviour under incentives. Safety climate, according to Cox and Flin (1998), is “a manifestation of safety culture in the behaviour and expressed attitude of employees”. Elements of safety emerge as predictors of unsafe behaviour or accidents in numerous structural models (Brown, Willis & Prussia, 2000; Cheyne et al, 1999; Thompson, Hilton & Witt, 1998; Tomas et al, 1999) and non-linear models (Guastello et al, 1989; Guastello et al, 1999). It is accepted that a favourable safety climate is essential for safe operation in any organization.

Hofmann, Jacobs & Landy (1995) labeled the individual attitudes and behaviour discernible in safety climate as the micro-elements of an organization, which themselves are determined by macro-elements of the safety management system and practices. In this sense, management attitudes and behaviour toward safety permeate down in the organization to the workforce.

In fact, not many studies have been done in this area in Nigeria. Globally, researchers are zealous to explore the mechanism by which leadership interacts with safety climate to determine employees‟ safety behaviour. For instance, in a study by Neal, Griffin and Heart

(2000), 525 hospital workers from Australia exhibited evidence to support a model in which employees‟ attitudes to general organisational climate (represented by a number of management variables including praise and recognition, goal congruency, role clarity, supportive leadership, participatory decision-making, professional growth and professional interaction) exerted a significant impact on safety climate. Also, safety climate was in turn related to employees‟ self-acknowledged compliance with safety regulations and participation in safety-related activities. This study shows that the safety climate might be made within the context of general climate of organisations. Thus, O‟Dean and Flin (2003) noted that interventions designed to improve general organisational climate may have a positive impact on safety climate.

Hofmann and Stetzer (1996) discovered in their study that employees‟ perceptions of safety climate are informed by their perceptions of the actions of management. This shows that employees attach meaning to actions of management that affect their behaviour. Similarly, Diaz and Cabrera (1997) investigated employees of three companies involved in airport ground management in Spain. They identified three dimensions of the safety climate viz company policy towards safety, management‟s commitment to safety, and perceptions about the organization‟s philosophy concerning safety versus production priorities. In all, the dimensions were able to discriminate between organisations with different levels of safety. Organisational climate relates strongly to attitudes of management through its control of factors which influence participation, commitment, safety policies and procedures, work pressure, and safety activities. O‟Dean and Flin (2003) affirmed that these factors exerted a strong impact on individual motivation to achieve work outcomes, and also provide a context in which specific evaluations are made

of the importance of safety.

The researcher of this study noted that participants viewed the general organisational climate as having direct influence on their safety need positively or negatively. Invariably, whatever their experience is in terms of organisational climate has significant impact in determining their work outcomes. Generally, they rated their organisations low on safety and other features of organisational climate, hence no significant difference between the organisational types on safety management practices.

### Humanistic Management and Safety Practices

Cohen et al, (1975) and Smith et al, (1978) discovered that the plants with low rates of accidents tend to use a “humanistic” approach in dealing with employees. In this regard, these plants had great value on good labour relations and engaged in more frequent and more positive contact with employees. The management in these plants seemed to have higher regard for their employees and treated them with much respect in their work and showed great concern for them personally. The employees therefore feel highly appreciated as individuals and that their contributions are valuable to the organization. It is on this basis that Smith et al, (1978) believed that there is a very sharp contrast between companies with low and high rates of accidents. DeMichei et al, (1982) made similar findings in the mining industry.

Furthermore, Simonds and Shafai-Sharai (1997) discovered that companies that provided recreational programmes for their workers tended to have outstanding lower rates of injury than companies without such programmes. This result has been attributed to two possible explanations: that such programmes are mostly seen by employees as an aspect of management‟s concern for their welfare; or alternatively, that recreational programmes

may help to bring employees together and lead to more friendly and cohesive relationships among workers. Mearns et al, (2000) also found that oil installations with better health promotion and surveillance policies and practices had low rates of accidents and incidents. They therefore proposed that significant investments companies in this area will foster more positive perceptions of the companies‟ commitment and foster higher loyalty in the workers in areas like safety behaviour.

### Decentralisation of Power, Flexibility and Safety

In a study of workers‟ attitudes at seven manufacturing plants in New Zealand, Dwyer and Raftery (1991) discovered that management‟s use of power was among the causes of industrial accidents. Of particular note is the high-handed manner of management, its control over work organization, and task structure which reduced autonomy and integration amony workers. All are associated with higher rates of accidents. Although none of these variables alone accounted for majority of accidents, but a combination of the factors had the capacity to make a difference in the rates of accidents. As a matter of fact, the investigators noted that accidents were low when autonomy was high, and the weight of rewards and command hierarchy in management was low. Rates of accidents were high when auto-control was low, and the weight of rewards and command hierarchy in organisational management was high. Many other studies that support these findings are DeMichei et al, (1982); Goodman (1987), Braithwait (1985), Sanders, and Paterson and Peay (1976). For instance, DeMichei et al, (1982) found that at high rates of accidents in the mines, senior managements were more reluctant to devolve decision-making power to supervisors or employees. Also, Goodman (1987) studied coal mines in the USA, and discovered that the reorganisation of work sections into an autonomous work group

resulted in an increase in employees‟ knowledge of safety practices and procedures, and brought about beneficial changes in communication, interaction and level of responsibility shown by individuals. Similarly, Braithwait (1985), in his study of five coal mining companies with outstanding safety records, suggests that decentralisation in decision- making regarding safety is a common characteristic among large mining companies with better safety records. These companies were reported to have a combined centralized focus on safety through policy setting, with decentralized safety practices through line management responsibility for implementation and performance. Sanders, Patterson and Peay (1976) also made similar findings that decentralised decision-making and flexible management have a relationship with reduction in rates of injury. In Zeffane (1994), flexibility and adaptation were the most predominant predictors of organisational commitment.

Furthermore, the evidence of Simard and Marchand (1994, 1995, & 1997) also supported strongly the view that decentralisation in decision-making is an effective strategy for prevention of accidents. It is argued that a decentralized approach from the top promotes the supervisor‟s capacity and willingness to behave in a participatory manner with employees. These results showed that higher internal cohesion within the work group, and greater cooperation with the supervisor are both associated with lower rates of accidents (O‟Dean and Flin, 2003). Similarly, Wood, Barding, Lasaosa, and Parker (2000) in a large-scale study of industrial-organisations in the UK, discovered that high involvement of supervision style and a decentralised approach of management were also predictive of more positive safety outcomes.

Simard and Marchand (1995) declared that a decentralised approach to safety management is the most effective way management can promote employees‟ motivation for safety awareness, which is achieved by encouraging a synergy between supervisors and employees in activities relating to structural safety. They also declared that decentralised management at all levels is not only the best predictor of work groups‟ propensity to take safety initiatives, but also the most important factor in relation to two predictors of motivation for safety awareness at work, which includes workgroup cohesion and cooperation. Comparative relationships here involve a positive team spirit and a willingness to cooperate with other team members and other teams in order to achieve the organisational goals.

### Senior Managers‘ Attitude to Safety

The perceptions of chief executives or directors about health and safety in the organisations are rationalised by the outcome of researches by Ashby and Diacon (1996) and Smallman and John (2001). Their results showed that companies evolve through stages of maturity in health and safety practice. They move from „compliance‟ stemming from a desire to limit liability costs to enlightened paternalism”, which results from a sense of duty to employees and other stakeholders, and further to „external competitiveness”, which is related to a sense of pride in the organisation. In all, the result revealed that directors view occupational health and safety as a significant determinant of performance. In any case, the studies did not identify whether the attitudes of the directors were translated into practice when critical decisions concerning safety or production were taken. However, this is more likely to occur when safety is seen as integral to competitiveness and profitability.

Rundmo and Hale (in O‟Dean and Flin, 2003) investigated the attitudes of 210 senior managers in an industrial company in Norway to safety and accident prevention. The study was an effort to analyze the association between safety attitudes, behavioural intentions and safety behaviour of the managers using the instrument of questionnaires. The results showed that senior managers‟ attitude to safety was an important causal factor in their behavioural intentions and safety behaviour. The study also revealed that high commitment on the part of management , low fatalism, high safety priority, and high risk- awareness are particularly important issues for managers to bear in mind. They are strongly predictive of behavioural intentions and their safety behaviour.

Eyssen–Mcheown, Hofmann and Spengler (1980) examined managers‟ attitudes to accidents in a telephone company in Canada and discovered that managers‟ self reports on their attitudes to safety correlated with low rates of accidents. Their constructive attitudes include a greater perception of risks, a greater priority accorded to safety, the belief that accidents are preventable, a belief in the effectiveness of their own actions, a focus on incentives to reduce accidents rather than on undesirable results of accidents, the belief that accidents reflect badly on one‟s abilities, the belief that accidents interfered with productivity, and the belief that time spent on safety is appreciated. Focusing on the barriers to safe work and the feeling that one‟s efforts are being hindered by superior management were associated with higher rates of accidents.

### Management‘s Commitment to Safety

Two separate researches conducted by Cohen, Smith and Cohen (1975) and Smith, Cohen, Cohen and Cleveland (1978) examined 42 USA companies that were matched in pairs. After the data from the studies‟ questionnaires and interviews were analyzed, the results

revealed that management‟s commitment to safety was greater in plants with low rates of accidents than plants with high rates of accidents. In the former, commitment was expressed through the allocation of resources to plant safety and health, and there was more active involvement and participation by management in matters concerning safety programmes.

The findings of these studies were supported by those of Cohen and Cleveland (1983), in which the management of five top companies doing business in the United States expressed the view that workers‟ safety takes precedence over all other matters, including production. Also, all the companies had written policies on corporate safety, which were implemented throughout the levels of the organisations.

Many other works have shown relationships between management commitment and a wide range of outcomes which include employees‟ evaluations of safety and contingency measures (Rundmo, 1994); incident reporting (Clarke, 1999); personal actions for safety (Cheyne, Cox, Tomas & Oliver, 1998); risk perception (Kivimiaki et al, 1995), and incident and rate of accidents (Alexander, Cox & Cheyne, 1995; Donald & Canter, 1994; Mearns, Flin, Gordon & Fleming, 1998).

Another study by O‟ Dean and Flin (2001) attempted to model the influence of factors of site management on supervisor and employee level variables in one company from the UK‟s offshore oil and gas industry. Employees‟ attitudes to commitment of management to safety, commitment of supervisors to safety, worker-management participatory involvement, self-rated commitment of worker to the organization, and worker cohesion were used to predict self-rated compliance of workers and safety initiative behaviour using structural equation model. Employees‟ perception of the commitment of site managers to

safety was found to be the most important factor in the model. It directly predicted workers‟ perceptions of commitment of supervisors to safety and participatory involvement of workers. It also indirectly predicted behaviours of compliance with rules. Workers‟ participatory involvement in safety was a key mediating variable in the model. The study also directly predicted workers‟ compliance with rules, and indirectly predicted workers‟ initiative safety behaviour, which was later mediated by workers‟ commitment to the organisation.

This finding supports earlier empirical studies by Dwyer and Raftery (1991); Simard and Marchard (1994, 1995), which identified a link between managers‟ participatory involvement with employees and improved safety outcomes. The path between participatory involvement of workers and workers‟ commitment to organization was shown to be the strongest in the model. This evidence supports the findings of Gaerthner and Nollen (1998), Kivimiaki et al, (1995), Niehoff, Enz and Crover (1990), Zeffane (1994), which all showed that flexible management and worker involvement are the strongest predictors of commitment to organization. Commitment to organization significantly predicted workers‟ initiative behaviour, and participatory safety involvement predicted workers‟ compliance with rules. The findings suggested that site managers are not only influential in improving higher level motivation to take safety initiative; they are also influential in determinig task related outcomes such as compliance with rules.

### Management‘s Motivation for Safety

In order to increase workers‟ motivation for safety, the senior management must increase supervisors‟ and workers‟ capacity to engage in participatory behaviour to meet their social autonomy needs. In the study by Bass and Avolio (1990) on transformational

leadership, they observed that positive relationship exists between a higher employees‟ motivation for safety and reduced rates of accidents.

The empirical evidence suggests that it is not just the commitment of management to safety activities that is important, but the extent to which management encourages the involvement of the workforce, who must be permitted to help shape interventions rather than simply playing the more passive role of recipients. In the same vein, Cohen and Clevenland (1983) observed from their three phased study that people work more safely in the following situations: when they are involved in decision-making processes; when they have specific and reasonable responsibilities, authorities and goals; and when they have immediate feedback about their work.

Safety motivators like rewarding good safety behaviour and punishing unsafe attitudes in organisations play very big role in enhancing organisational safety behaviour that reduces rates of accidents and increases organisational effectiveness. This is the major reason why intervention strategy ISy (reward system) was adopted in the PSM model of this study.

Andriessen (1978) through factor analysis identified two relatively independent elements, related to motivation for safety. These are carefulness and safety initiative. The first is related to the individual‟s propensity to take unnecessary risks, while the second deals with the individual‟s propensity to improve the general work situation on one‟s own initiative. To him, each construct appears to have its own unique predictors: people are more careful when they recognize that being so does not hinder their work speed; that safe behaviour really does contribute to reducing accidents; and people show more safety initiative when the supervisor and colleagues react positively to it. Simard and Marchard (1995, 1997) used the distinction made by Andriessen (1978) to investigate the micro and macro levels of constructs which predict employee safety initiative and carefulness. Micro

level factors are those that operate at the shop-floor level, and they include: work processes, work hazards, workgroup cohesiveness and co-operation, supervisors‟ experience and supervisors approach to safety management. On the other hand, the macro level factors are those of the organisational management such as: decision making, pressure of meeting target, production/safety priority and so on.

### Management‘s Involvement in Safety

The studies by Cohen et al, (1975) and Smith et al, (1978) discovered that management‟s involvement in a number of safety activities were associated with good safety performance. Such activities include personal inspections of work areas, open and informal communications between workers and management, and frequent contacts between workers, management and supervisors. They concluded that active involvement of management acts as a motivational force for both management and employees. In four out of five top performing companies in USA, Cohen and Cleveland (1983) discovered that the managers were highly involved in the development and execution of plant safety programmes. Simonds and Shafai–Sharai (1997) reported similar findings. DeMichiei,

Langton, Bullock and Wiles (1982) conversely discovered that in five mines with high rates of accidents, the safety department personnel identified the non-involvement of management in safety matters as a serious impediment to improving safety and health conditions at the mine. In these mines, responsibility for safety was often delegated to safety personnel, who lacked the authority to direct operations personnel to follow standard work procedures. Zohar (1980) had similar findings which discovered that managers in less effective companies tended to assign all responsibilities to specified safety personnel without delegating executive power to them.

Brown and Holmes (1986) designed a study to test Zohar‟s eight-factor-model of safety climate and identified three over arch factors: employees‟ perceptions of management‟s concern for their well being, employees‟ perception of the extent of management‟s response to it, and employees‟ perceptions of physical risks.

Dedobbeleer and Beland (1991) in a follow up study of safety on construction sites reduced this three-factor-model to two factors with paths of influence between commitment of management to safety and worker involvement in safety. Commitment of management to safety involves attitude of management to safety and safety practices as a single dimension. Workers‟ involvement in safety includes workers‟ perception of control and workers‟ perception of physical risks as a single dimension. This therefore suggests that workers‟ perceived control and risk may be highly related to workers‟ involvement or responsibility for safety. Moreover, workers appear to perceive safety as a joint responsibility between workers and management.

### Production versus Safety

Cohen and Cleveland (1983) stated that all top performing companies in the United States had certain characteristics in common. In each case, safety was a real priority in corporate policy and action. Also, safety practices and procedures were considered intrinsic to ongoing production goals. Diaz and Cabrera (1997) similarly found that employee‟s perception of organisation‟s philosophy of either production or safety is the second most important factor (after organisational policies towards safety) in predicting safety performance. Gaerthner et al (1987) also discovered that companies with better safety

records were more productive. They therefore interpreted this finding as a reflection of management‟s capacity to convince the workforce of a consistent clear position which supports safe production.

Wright (1986) investigated causes of accidents in the UK‟s offshore oil industry and discovered that perceptions of performance pressure can lead workers to believe that engaging in short cut behaviour is an expected or required part of the job. Therefore, those workers who perceive a high degree of performance pressure would focus their attention on completing the work and focus less on the safety of their work procedures.

Similarly, Pfeifer et al (1976) indicated that supervisors in mines with low rates of accidents were significantly less inclined to push hard for production or to cut corners on safety. Also, Sanders et al (1976) discovered that increased levels of production pressure at twenty-two coal mines in the USA were associated with increase rates of injuries.

### Management Development of Supervisors‘ Skills on Safety

Bentley and Haslan (2001) found that supervisors‟ impact on safety in postal

delivery offices arises from both their attitudes and their actions. According to Heinrich (1959), “The Supervisor or foreman is the key man in industrial accident prevention. His application of the art of supervision to the control of worker performances is the factor of greatest influence in successful accident prevention”. Considering the position of the supervisor in individual accident prevention, management owes the organisation the responsibility to help the supervisors develop the skills necessary for their work of supervision.

Given the above need, many studies have been carried out to measure the contributions of supervisors in determining organisational safety outcomes. Such studies include (Mearns et al 1998; Niskanem, 1994; Simard and Marchand, 1994). In this regard, studies have concentrated on the nature and quality of the interpersonal relationship between supervisors and employees, and the impact this has on employee commitment, motivation and carefulness. For instance, Bentley and Haslan (2001) found that supervisors‟ impact on safety in postal delivery offices arises from both their attitudes and their actions. O‟Dean and Flin (2003) however noted that the precise role of the supervisor in safety management may depend on the way the work is organised.

Consequently, supervisors‟ safety skills of openness and support, participatory involvement, fairness, autonomy, reduction of production pressure, transformational leadership style, subordinate motivation, team spirit, objective assessment of subordinates, and so on, must be encouraged and developed by the management considering the positive safety outcomes involved. For instance, Davis and Stahl (1964) discovered that in most successful mining companies, supervisors were involved in training, and there were regular meetings between supervisors and employees to discuss safety. Cohen et al (1975) identified significant differences in these aspects in supervisor behaviour which could be associated with better safety performance: spending a large portion of their time on occupational safety matters, being involved in the development of safety programmes, and being involved along with workers in the safety inspections and accident investigations. Also, Chew (1988) established a significant association between the involvement of first line supervisors in safety work and lower rates of injury.

Fleming, Flin, Mearns and Gordon (1996) found that the more effective supervisors used a

more participatory management style and placed more emphasis on team work within the

group. They also valued group work more, and recognized safety as an important part of their role. On the other hand, the less effective supervisors were characterized by avoidance behaviours and did not value their staff. They also lacked participatory styles and did not trust subordinates; rather, they spent much of their time policing the workforce. Similarly, Mattila, Hyttinen and Rantanen (1994) investigated supervisors and rates of accidents at sixteen construction sites of a company. They found that most effective foremen often give their workers feedbacks and spend a greater proportion of their time communicating with workers about issues not connected with their work. Simard and Marchand (1994) also discovered that participatory supervisory relationships with the workforce are associated with improved safety outcomes. They concluded that participatory supervisory behaviour promotes more cohesive relationships and more cooperation by the workers with the supervisor, both which are positively associated with safety rule compliance and workforce initiative of safety behaviour.

Furthermore, Hilton, Thompson and Witt (1998) found that supervisors‟ role in promoting safety at workplace is achieved by applying a positive level of fairness in their organisation‟s climate, which in turn impacts on workforce compliance with safety rules. Similarly, Reason (1997) opined that workers‟ perception of a “just” culture is a crucial element of an organisation‟s safety culture. Therefore, engineering a just culture depends on the trust of the workforce and a clear differentiation between acceptable and unacceptable behaviour.

Simard and Marchand (1995 and 1997) discovered that worker compliance is higher when supervisors have some power and influence over decisions that affect the safety of their work groups, and involve their workers in the conduct of accident prevention activities.

They concluded that top managers may have more impact on effectiveness if they promote a decentralised approach which encourages the joint involvement of supervisors with employees in relatively structured safety activities, rather than a centralised and bureaucratic approach. In the same vein, DeMichiei et al (1982) discovered that supervisors at mines with high rates of accidents did not have as much freedom to make decisions concerning health, safety and production as did section supervisors at mines with low rates of accidents.

### Worker-Management Safety Communication and Co-operation:

Communication, in literal terms is a means of giving and receiving information. It involves not merely the transfer of information, ideas, facts, advice and so on to another person or persons, but more importantly, it involves their understanding of the idea transmitted so that they act in the way intended. Fagbohungbe and Longe (1999) defined effective communication as information transmitted to a receiver who receives it, decodes it, understands it, uses it and provides a feedback to the sender.

Safety communication can therefore be described as the propagation or spreading of information on safety of lives and property in our living and working environments. To ensure effective management of safety in any organization, the person(s) communicating should have a good knowledge of the topic under discussion, and the message should be completely and clearly specific, and stated in terms that could be understood by those actually involved.

Safety communications in organisations (that is between management and workers) should not be confronted with bottlenecks which would sabotage the aim and objectives of safety

policies within the time frame. High levels of communication and interaction between workers and management have been associated with positive outcomes in many studies. For example, the National Academy of Science (NAS 1982) study discovered that in mines with low rates of injury, there was an attitude of co-operation between management and workers and in three of the five mines with high rates of injury, an antagonistic attitude between management and workers was observed.

Similarly, Kivimiaki et al (1995) found that feedback communication, participatory management and length of time spent by management at the worksite were associated with good performance. Smith et al (!978) also found that management of plants with low rates of accidents had a higher level of one to one interaction with their employees, while in plants with high rates of accidents, management more often relied on committees to interact with employees. Similarly, Cohen and Cleveland (1983) discovered that top performing companies provided direct and immediate channels of communication and positive employee/management interaction. In all the companies, some form of immediate feedback was used to motivate their employees.

The importance of interaction between managers and workers has been clearly established through various researches. Specifically, management participation and involvement in work and safety activities, as well as frequent, informal communications between workers and management are recognised as critical behaviours. These interactions serve useful functions such as demonstrating the managers‟ concern for safety; serving as a frame of reference for the workforce to guide appropriate task behaviours; fostering closer ties between managers, supervisors and workers; encouraging a free exchange of ideas on job

improvement and providing the opportunity for early recognition of hazards and improper job practices (Cohen, 1977).

Also, Hofmann and Morgeson (1999) examined employee-supervisor relationship from a dyadic perspective, and found that employee perceptions of organisational support and high quality „leader member exchange‟ (that is, open, two-way and frequent communication) were significantly related to employees‟ willingness to engage in safety communications. High quality leader member-exchange was also significantly related to employees‟ safety commitment and reduced accident rates.

Furthermore, Niskanem (1994) studied the Finnish road administration and construction workers and found that the most effective supervisors had a more supportive style of leadership and often initiated discussions about safety, in addition provided increased amount of positive feedback on safety issues. Similarly, Pfeifer et al (1976) and DeMichei et al (1982) reported in their findings that miners in mines with low rates of accidents are more likely to report small incidents and unsafe conditions to supervisors if the supervisors are open and responsive to the behaviour of employees.

### Organisational Commitment

Organisational commitment has been defined as the emotional bond or attachment between staff and their firm (Meyer & Allen, 1997; O‟Reilly & Chatman, 1986). Mowday, Steers and Porter (1979) defined organisational commitment as the relative strength of an individual‟s identity within a particular organization. They further described organisational commitment as “the relative strength of an individual‟s identification with and involvement in a particular organization, that can be characterized by three factors (i)

a strong belief in and acceptance of the organization‟s goals and values, (ii) a willingness to exert considerable effort on behalf of the organization, and (iii) a strong desire to maintain membership in the organization.” Luthans (2007) stated organisational commitment as “an attitude reflecting employees‟ loyalty to their organization the part of their organization and is an ongoing process through which organisational participants express their concern for the organization and its continued success and well-being”. Henkin and Marchiori (2003) on the other hand, defined organisational commitment as “a feeling of employees which force them to be the part of their organization and recognize the goals, values, norms and ethical standards of an organization.” Shaw (2003) identified three dimensions of organisational commitment to include: affective, continuance and normative commitment. Affective commitment involves positive, sincere and utmost involvement of employee for his/her organization. Continuance commitment can be seen when an individual is committed with the organization because of some specific benefits like pension, insurance, medical and other fringe benefits, while employees‟ commitment with the organization because of the ethical standards or social norms is called normative commitment. According to Tell et al (2007), organisational commitment is the strongest motivator that highly affects persons‟ intensions to perform well, increase his efficiency, and improves his skills.

To date, extensive research has been done to investigate the impact of organisational commitment on behaviour and attitudes at the workplace ( Milliman et al., 2003; Peterson, 2011). Organisational commitment has been investigated as a predictor of several organisational outcomes as well as specifying organisational effectiveness behaviour

(Mathieu & Zajac, 1990; Meyer & Allen, 1997; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Sinha & Jain, 2004).

In examining the consequences of organisational commitment, Steers (1977) indicated a significant correlation between commitment and intent to remain in the organization r = 0

.31 and turnover r = 0.17. Many recent studies have shown the existence of significant relationships between management commitment and a wide range of outcomes as earlier on reported in this study, which include employees‟ evaluations of safety and contingency measures (Rundmo, 1994); incident reporting (Clarke, 1999); risk perception (Kivimiaki et al, 1995); and incident and accident rates (Alexander, Cox & Cheyne, 1995; Donald & Canter, 1994).

Generally, demographic and background factors have been significantly, but not strongly related to organisational commitment. Organisational commitment was found to be positively related to age (Lee, 1971; Hrebiniak & Aluto, 1972; and Hrebiniak, 1974) and tenure with the organization (Hall and Lawler, 1970 and Stevens, Beyer & Trice, 1974 & 1978). Loscocco & Kalleberg (1988) reported age differences in work commitment and work values among 4567 Americans and 3735 Japanese manufacturing employees. They found that there was a greater work commitment among older Japanese and American men, and American women, when compared to their younger counterparts; while among older Japanese men, less emphasis was placed on good pay.

Organisational commitment was found to be negatively related to the level of educational attainment and perceived alternative job opportunities (Steers, 1977 and Salanick, 1977); and differentially related to marital status (Angle and Perry, 1981). However, no significant relationship was found between number of children and organisational

commitment (Aranya & Jacobsen, 1975); and between organisational commitment and gender differences (Aven, Parker & McEvoy, 1993; Savicki, Cooley & Gjesvold, 2003; Al-Ajmi, 2006 ; Ashkan, & Arnifa, 2012 ). It has been found that organisational commitment has positive relationship with organisational performance and effectiveness ( Salami, 2008; Jain, Giga and Cooper, 2009; and Muthusamy, 2009); and with transformational leadership (Avolio et al. 2004; Limsili and Ogunlana, 2008; Ismaila and Yusuf, 2009; Bushra et al., 2011).

Mathieu & Hamel (1989) developed a model in which personal needs, job characteristics, role status, work experiences, employees‟ job satisfaction and mental health were found to be causal factors to organisational commitment. On the other hand, Dornstein and Matalon (1989) used questionnaires to collect data from 250 Israeli army personnel and discovered the following variables: interesting work, co-workers‟ attitudes toward the organization, organisational dependency, education and age, attitudes to family and friends, employment alternatives and importance to organization as potential predictors of organisational commitment. To the researchers, these variables explained 65% of the variance in organisational commitment, which means that they were significant causal factors.

In an attempt to identify the antecedents and consequences of organisational commitment, Rotter & Mills (1982) examined the linkages between organisational commitment, employees‟ intention to remain on the job and attitudes towards absenteeism among 368 health professionals in two hospitals. They discovered that work climate, quality of work life, and physicians‟ relationships were quite closely related to commitment and intention to remain in the organization.

In another study, Zeffane (1994) investigated the relationship between perceived management styles and organisational commitment among 1418 public and private sectors‟ employees in Australia. Management style was hypothesized to incorporate four sub-dimensions: (1) flexibility and adaptability; (2) rules and regulations; (3) hierarchy and role specification; and (4) degree of work-group discontinuity and change. Multiple regressions revealed that organisational commitment was affected positively by flexibility and adaptation, and by role hierarchy and specialization. The results of the study strongly suggested that aspects of management style as perceived by members account for a significant amount of the variance in commitment. Perceived emphasis on flexibility and adaptation seems to be the most predominant predictor of commitment. Employees‟ perception of a bias toward such style then developed greater commitment to the goals and values of the organization.

Oloko (1977) concluded that many Nigerian workers do not perceive any satisfactory relationship between their efforts and their organisations‟ reward for their efforts. This explains their low level of involvement in the activities of their organisations. As noted earlier on, incentives are not restricted to money alone, but also to other related needs and expectations of workers. For instance, Etuk (1981) conducted a study on Executive Officers in government ministries and organisations, and the result revealed that officers attached significant importance to achievement and promotion opportunities more than other things.

Sinha (1973) made a comparative analysis of leadership styles, pattern of reinforcements and result norms, expectation and satisfaction in the executives of public and private organisations. The results revealed that in the public sector, employee-oriented type of supervision, high social interaction, participation by representative type of decision-

making, and promotions were based on personal connection both inside and outside the organization and not on merit. This generally led to low productivity and low commitment to organisational goals. In the private sector on the other hand, there was a task-oriented type of supervision, low social interaction, and high level of commitment, involvement and high productivity.

The present study however investigated among other things, the impact of situation awareness and safety management practices on organisational commitment in both public and private sector organisations.

### Job Involvement

Job involvement has been defined as an individual‟s psychological indentification or commitment to his/her job (Kanungo,1982a). It is the degree to which one is cognitively preoccupied with, engaged in, and concerned with one‟s present job (Paullay et al., 1994). Kanungo (1982b) revealed that “people who are high in job involvement genuinely care for and are concerned about their work”. Elias and Mitta (2011) stated that “employees with a high level of job involvement pay great attention to the tasks they do in organisations and consider their job central to their life”. On the other hand, those with a low level of job involvelment feel that their life is separated from their job and that other things are much important than their job ( Elias and Mittal, 2011; Griffin, Hogan, Lambert-Gail, & Baker, 2010). Job involvement receives attention from researchers because of its positive relationships with work attitudes and behaviours. Griffin et al (2010) found that those who have a high degree of job involvement are more likely to feel emotionally drained and used up by the job. Job involvement has been found to enhance organisational citizenship behaviour and performance and is negatively related to absences

and turnover ( Kuruuzu‟m, Cetin, & Irmak, 2009; Rotemberry & Moberg, 2007; Teh & Sun, 2012). Wending et al,(2008) concluded that the more involved employees become in jobs, the more important they regard organisational skills and cognitive skills in the job. Further, employees who are more involved in their job tend to display higher level of job skills.

The construct of job involvement is somewhat similar to organisational commitment in that they are both concerned with an employee‟s identification with the work experience. However, the constructs differ in that job involvement is more closely associated with identification with one‟s immediate work activities, whereas organisational commitment refers to one‟s attachment to the organization (Brown, 1996).

Studies over the past two decades, which have explored the construct of job involvement, have approached it from two different perspectives (Sekeran, 1989; Sekeran & Mowday, 1981). First, when viewed as an individual difference variable, job involvement is believed to occur when the possession of certain needs, values or personal characteristics predispose individuals to become more or less involved in their jobs. For instance, Rabinowitz and Hall (1977) revealed that individual characteristics such as age, education, sex, tenure, need strength, level of control and values were linked to job involvement. The second perspective views job involvement as a response to specific work situation characteristics. In other words, certain types of jobs or characteristics of the work situation influence the degree to which an individual becomes involved in his/ her job. For example Brown(1996) related job involvement to job characteristics such as task autonomy, task significance, task identity, skill variety and feedback; and supervisory behaviours such as leader consideration, participative decision making and amount of communication. Fostering job involvement is an important organisational objective because many

researchers consider it to be a primary determinant of organisational effectiveness (Pfeffer,1994) and individual motivation (Hacckman & Lawler, 1971). These links stem from the theoretical notion that being immersed in one‟s work increases motivational processes, which in turn influence job performance and other relevant outcomes like turnover and absenteeism (Diefendorff et al., 2002). The general perception is that people with high levels of job involvement are likely to put more effort into their jobs and therefore tend to display higher levels of in-role performance (Brown and Leigh, 1996; Aamir, 2008). Lassak et al. (2001) argued that occupation specific measures of job involvement be created and consequently developed a measure of „salesperson job involvement‟. Their study uncovered a significant positive relationship between one facet of their measure-involvement and performance. Using a measure created by Paully et al.(1994) to differentiate job involvement from work centrality, Diefendendorff et al. (2002) found a significant correlation(r =0.15, p 0.05) between job involvement and supervisor- related in- role performance. Also, Rotenberry and Moberg (2007) reported significant positive correlation(r=0.15; p 0.05) between job involvement and in- role performance.

Schein (1990 &1996) and Steers (1975a) suggest that job involvement may represent one useful indicator of effectiveness of an organization. Steers (1977b) sees performance to be positively related to job involvement; while Porter, et al (1976) predicts that individuals who develop high involvement to organisational goals, and are willing to devote a great deal of energy towards those goals would be inclined to remain with the organization.

Many recent studies have found a significant correlation between job involvement and organisational citizenship behaviour. Such studies include: Munene, 1995; Organ and

Ryan, 1995; Somers and Birnbaum, 1998; Diefendorff et al., 2002; Bolger and Somech, 2004; Chu et al., 2005; and Rotenberry and Moberg, 2007. Akinbode (2011) noted positive correlations between interpersonal relations/emancipatory leadership behaviour and organisational commitment variables (job involvement, job identification and job loyalty).

Some studies also show that people work more safely when they are involved in decision- making process and when they have reasonable and specific responsibilities, authorities and goals; and when they have immediate feedback about their work (Cohen & Cleveland, 1983). On the other hand, lack of upper management involvement in safety matters was found to be a serious impediment to improving safety and health conditions in the mine (DeMichiei, Langtoh, Bullock and Wiles (1982).

### Organisational Effectiveness

A good number of studies on organisational effectiveness have been related to various variables like size, structure, strategy, environment and technology. Others however, have related organisational effectiveness to market conditions, decentralization of authority, and task environment. Pennings (1976) related participation, centralization and organisational autonomy with four indicators of organisational effectiveness namely: decline in production, financial loss due to errors, morale, and anxiety. More specifically, the study investigates whether it is the overall design or the design at different organisational levels makes it possible to predict organisational effectiveness (i.e. determining the influence of an organization on its effectiveness). The result shows that the individual and the joint effects of the influence variables (participation, centralization and autonomy) are very strong, which means organisations that have these characteristics are more effective.

However, even though there is a positive association between these variables and organisational effectiveness, only financial loss and anxiety are significantly correlated.

Angle and Perry (1981) investigated the relationship between organisational commitment of lower level employees and organisational effectiveness. The study used absenteeism, tardiness, turnover, high level of operating efficiency and organisational adaptability as measures of organisational effectiveness. The research is designed to find a systematic relationship between members‟ commitment to their work and several indices of organisational effectiveness. The result of the study shows that organisational commitment is associated basically with the following: adaptability, turnover, and tardiness. It is however not associated with operating cost or absenteeism.

In another study, Hirsch (1975) considers the institutional environment in the study of organisational effectiveness by comparing the organisational effectiveness of the Phonograph record making/producing industry and the ethical pharmaceutical industry (the practice that 60% of all drug sales should be on doctors‟ prescription). The study is intended to explore the collective interaction of organisations in each industry with their institutional environment, because the two industries considered in the study are process and production. The ability to control three aspects of the environment is thought to account for the differential performance of these industries. The three aspects are pricing and distribution, patent and copyright law and external opinion leaders, which represent strong differences in organisational effectiveness.

The analysis of Hirsch‟s study provides an illustrative example of taking the whole industry as a unit of analysis to better specify concrete institutional mechanisms and their relationship to organisational performance. The study finds that despite similarities in

technology and other aspects of their operations, the typical pharmaceutical manufacturing firm is far more profitable than the typical phonograph record making/producing company. The industries are compared in terms of their institutional environments from 1950-1965.

In another study, Johnson and Schneck (1982) attempt to measure and analyze the relationship between a host of internal and external effectiveness criteria that could be used to evaluate the police force. The basic assumption of the study is that an organisation (especially a human services organisation) cannot exclusively assess its own effectiveness. In view of this, multiplicities of internal and external criteria are needed for a more comprehensive evaluation of such organisations. In this case therefore, the study chooses quality of service to clients as a central focus in evaluating the effectiveness of public service organisations. These researchers however used the goal model to identity, measure, and inter-relate effectiveness criteria in the police department. The four goals of Police organisations analyzed are:

1. Crime prevention
2. Criminal apprehension
3. Service to community, and
4. Civility in the process of Police interaction with citizens.

Effectiveness is defined in this context as the extent to which police units prevent or reduce crimes, resolve crimes already committed, serve the community by participating in its affairs, and are civil in dealing with the public. Using 18 police stations for the study, the four abstract goals are operationalised for measurement. Six external effectiveness criteria are also used.

The result of the study shows that the prevention of crime is the single most important effectiveness measure of the police. The measure is directly or indirectly related to all other criteria. The researchers related the findings in the Police Force to organisational effectiveness theory, and management of organisations as a whole.

The study further re-emphasized the following views:

1. That organisational effectiveness is a multi-dimensional, rather than unitary concept.

Organisations could therefore be simultaneously effective on one or several criteria and ineffective in others.

1. The research rejected the use of universal indicators of effectiveness (example, adaptability, flexibility, participant satisfaction and turnover) but instead chose criteria specifically related to the police force.

In another study, Cameron (1981) aimed at considering different domains of organisational effectiveness by using colleges and universities as case studies. Empirically, the study tried to identify the major domains that typified colleges and universities, and to assess the level of effectiveness in each of these domains. Secondly, the study attempted to determine the characteristics of institutions that explain the differences in domains of effectiveness among institutions of higher education.

A total of 41 colleges and universities in seven states of the United States of America (USA) were selected as the sample. The four major domains of organisational effectiveness identified include: academic, morale, external adaptation and extracurricular domains. Among the major institutional characteristics that predict domain effectiveness are type of academic programme offered, institutional affluence and institutional stability.

The findings showed that organisations frequently operate in multiple domains, but few organisations maximise effectiveness in all of the domains. More generally, organisations were found to be effective in a limited number of domains and ineffective in others. In fact, achieving effectiveness in one domain may militate against achievement in other domains. Four types of institutions were found to differ significantly in the domain of effectiveness in which they excelled.

In view of this, Cameron (1981) discussed three main implications of the results that have relevance for organisational theorists and for the evaluation of organisational effectiveness. These implications are stated in the following propositions:

1. Organisational effectiveness is a multi-domain construct.
2. When organisational effectiveness is viewed as a multi-domain construct, the relationships among other organisational variables are altered.
3. Organisational effectiveness in external domains may militate against effectiveness in internal domains.
4. Achievement of both internal and external organisational effectiveness is most unlikely.

In Nigeria, Okike (1986) attempted to verify the effectiveness of published financial statements for decision-making requirements of shareholders and potential investors. He found that the information contained in the published accounting reports could be misleading because of management‟s influence in various degrees on auditors. However, these published annual accounting reports still remain perhaps the most authentic, widely used and most accessible source of financial performance indicator of quoted public firms

in Nigeria today. In fact, Okike noted that despite this seeming setback observed earlier on, the information in the reports could still be relied upon for decision-making.

Omolayole (1982) pointed out that, of the biggest factors retarding progress in productivity in Nigeria is the poor attitude to work and general indiscipline in relation to work. Other writers like Ekpo-Ufot (1987) and Onosode (1982) readily agreed with this view. Omolayole‟s comparison of private and public sector organisations shows that productivity, no matter how it is defined, is more easily measured in the private sector than in the public sector. His argument is centered on the fact that private sector organisations set up measurable targets unlike public sector organisations. He noted that the policy of working towards a target has a way of bringing out the best in people. This gives private sector organisations, which operate by setting targets, considerable advantage over public sector organisations. Omolayele therefore identified in his factors responsible for the noticeable differences in performance of private and public sector organisations to include the following:

1. Size of the Organization: The bigger the organization, the more the problems of management; hence, largeness is not necessarily synonymous with greater efficiency;
2. Degree of autonomy or lack of it;
3. Absence of competition in the public sector;
4. Accountability especially in financial matters are lacking in the public sector; and
5. The profit motive in the public sector is very poor compared to the private sector.

In another report, Beko (1985) exposed the significance of managerial behaviour in developing a sound economy. According to him, the engineers of organisational

effectiveness are managers. The question of organisational effectiveness is therefore critical to any consideration of managerial behaviour.

From the labour perspective, Osunde (1982) observed that what is wrong with our national productivity is not with the labour, but with the social system in which we operate. He enumerated 26 factors affecting productivity in Nigeria, and classifies them as general, technical and human. He shares the belief that if solutions are provided to most of these problems, Nigeria‟s productivity problem would be reduced. These problems include:

1. Irregular supply of electricity
2. Shortage of water supply
3. Dead telephones or non at all
4. Poor transportation system
5. Poor housing, nutrition and health
6. Lack of rest and recreation
7. Under-utilisation of human resources
8. Technical problem of old and worn-out machines
9. Perpetuation of foreign dominance in technology
10. Wrong deployment, mal-employment and under-employment or over- employment.
11. Brain drain
12. Poor industrial relation and frequent industrial conflict
13. Poor wages and salaries
14. Indiscipline and,
15. Tropical hot climate.

Gbadamosi (1985) examines Osunde‟s factors enumerated above and likened them to symptoms of, or resultants of low productivity than its causes. The belief is that if these problems or factors are eliminated, the present level of productivity in Nigeria would be improved through an effective and efficient workforce.

It is important to note that though the listed factors by Osunde are indeed associated with, or are resultants of organisational ineffectiveness in Nigeria, the “dead telephones or communication services” as mentioned in his work seems to be overtaken by events, given the advent of GSM in the telecommunication industry in Nigeria.

Furthermore, the researcher observes in the present study that one of the serious omissions of Osunde in his lists of factors that contribute to poor productivity in Nigeria is lack of adequate safety in the organisations. These involve lack of situation awareness on the part of the employees and non-proficient safety management practices in Nigerian organisations. This is evident in the rampant industrial/organisational hazards or accidents resulting in lost hours.

In addition, the prevailing insecurity in the country prompted by the Niger-Delta issues, the Jos crisis, kidnapping and the Boko Haram bombing and terrorists‟ activities, which is leaving organisational institutions and the entire civil society in Nigeria in quandary is more serious than any of the factors listed by Osunde. These threats to human lives and properties in most parts of the country have serious negative impact on the efficiency and effectiveness of Nigerian organisations. The distractions involved are bound to affect the level of productivity in the nation‟s institutions/organisations.

### Conceptual Framework

This study seeks for a conceptual linkage between the two safety factors ( Safety management practices and situation awareness); the predicted organisational outcomes (commitment, involvement and organisational effectiveness) and high organisational performance or internal performance. The figure below describes the inter-relationships among the variables under investigation.

**SAFETY FACTORS**

**1**

**2**

### 3

Training

Prog

**2**

**3 Reward system(**

**4**

**5**

**6**

4

* Commitment to Organizational Goals.
* Increased Involvement and
* High Organizational Effectiveness

PREDICTED

ORGANIZATIONAL OUTCOME (POO)

**HIGH ORGANISATIONAL PERFORMANCE/ INTERNAL SATISFACTION (HOP/IS)**

|  |  |  |
| --- | --- | --- |
| **SAFETY MANAGEMENT**  PRACTICES (SMP)   * Safety audit, inspection and hazard control * Health and safety policies and training * Leadership and safety motivations * Employees’ welfare * Managerial attitude to organizational safety * Provision and maintenance of protective equipment and development of supervisors’ skills * Safety promotion and surveillance * Managements’ commitment to safety * Safety communication | **ISx**  **Safety mgt Program**  ISy | **EMPLOYEES’**  SITUATION AWARENESS (ESA) |
| * Comprehension of Safety Information * Attitude to safety consciousness * Safety Perception |
|  |
|  | |

Figure 4: Proficient Safety Management Model. SOURCE: Field Work (The Researcher).

* + 1. Proficient Safety Management Model (PSMM) Explained:

Figure 4 above shows proficient safety management model in which the two principal safety factors under study (safety management practices and employees‟ situation awareness) and their component factors established through factor analyses are stated in 1 (SMP) and 2 (ESA) respectively.

From the model, an organisation attains proficiency in safety management by effectively implementing the nine components of SMP in1, which enhances the three components of ESA in 2. This will thus lead to predicted organisational outcomes (POO) in 3 and subsequently, high organisational performance or internal satisfaction (HOP/IS) in 4, which is the end result of proficient safety management practices in an organization; hence the completion of the model loop as it points back to the source.

### Identification of safety problem

All things being equal, organisations that experience consistent hazards/accidents and do not enjoy predicted organisational outcomes and high organisational performance/Internal satisfaction are prone to safety management problem. Consequently, an intervention strategy is needed to correct the imbalance for effective performance in the organisations.

### Intervention Strategy (IS)

1. SMPQ and SAQ tests should be administered on the entire workforce of the organisations, using the established norms for Safety management practices test (SMPQ: Mean score: M & F = 232.24; N= 600) and Situation awareness test (SAQ: Mean score: M & F = 257.78; N = 600) as yardsticks.
2. The results would indicate low performance scores on the tests, implying inadequate safety management practices and low level of employees‟ situation awareness respectively.

### 3a. Intervention Strategy One (ISx)

The organisation attains proficiency in safety management by effectively implementing the nine components of SMP and enhancing ESA by using the developed instruments to teach and train employees as to develop positive attitudes to safety.

### 3b. Intervention Strategy Two (ISy)

Next, the organisation engages in the implementation of a reward system that would embrace both positive and negative types; depending on the good or bad safety behaviour of the worker towards accident prevention or cause of it respectively.

1. SMPQ and SAQ tests are repeatedly administered to the same workforce of the organisation to assess the level of improvement in employees‟ performance, till the organisation becomes certain of the benefits as indicated in the model.

## CHAPTER THREE

**METHOD**

This chapter details out the systematic processes followed in achieving the set objectives. The study was carried out in two phases which includes: standardisation study and assessment study.

### Phase 1: Standardisation of instruments

This phase involves development of two psychological safety instruments and re- validation of an old existing psychological test. These tests are:

* 1. Situation Awareness Questionnaire ;
  2. Safety Management Practices Questionnaire; and
  3. Organisational Effectiveness Questionnaire (Old test). Re-validation with Nigerian sample was carried out to ensure suitability, reliability and validity of the instrument for this study.

### Phase 2: Assessment Study

This phase involves the assessment of participants on the measured variables of the study.

### Research Setting/Location

The research setting for this study was Lagos State, Nigeria. The choice of Lagos as the research setting is because Nigerians residing and working in Lagos cut across tribes, religion, educational levels, work experiences, occupational levels and so on. Also, selected organisations possess the same basic characteristics of being accident/hazard prone. Furthermore, the choice of this setting enhanced easy collection of data, as well as making the entire research cost effective.

The two phases of this study were carried out in the work organisations.

### Organisational Selection Technique

Purposive selection and Classified randomization selection techniques were applied for organisational selection. In this case, a four-man committee of health and safety experts drawn from the Federal Fire Service (FFS), the Nigerian Institute of Medical Research (NIMR) and the National Agency for Food and Drug Administration Commission (NAFDAC) including the researcher, met to first shortlist fifty (50) organisations of twenty-five (25) in each case of private and public organisations, that fall within the description of accident/hazard prone organisations. The criteria for organisational selection were based on the nature of work done, equipment used, products and materials produced, extent of risk involvement and the skill and abilities required.

The experts went further to write out all the names of these organisations (25 private and 25 public) on pieces of papers, folded and put them in two separate containers which were randomly picked one by one. This selection technique is referred to as Purposive technique /Classified randomisation technique, which gave all accident/hazard prone organisations equal opportunity of being selected. Thirteen (13) organisations were picked from each organisational type. However, it is important to note that this aspect of field work was carried out between the periods of 2005 to 2006 when all the selected organisations were functional, but now organisations like ADC airline and Sosoliso airline are out of service.

### Private Sector Organisations

These are organisations owned by individuals or corporate bodies (indigenous/foreign or joint venture).

Selected from these are: (1) Soma Associate Printing and Publishing (2) Nigerian Breweries PLC (3) Vanguard Media Ltd. (4) Tower Aluminum PLC (5) Femstar (Limca) Company Ltd. (6) Eko Hotels and Suites (7) Nestle Nigeria Plc. (8) AGIP Plc (9) ADC Airline (10) Sosoliso Airline (11) Prudential Guards Ltd (12) Halogen Security Company

(13) Dangote Pasta Company.

### Public Sector Organisations

These are government-owned organisations or parastatals. The selected organisations are:

(1) Nigerian Telecommunication (NITEL) (2) Nigerian Postal Agency (NIPOST) (3) Nigerian National Petroleum Company (NNPC) (4) National Agency for Food and Drug Administration Commission (NAFDAC) (5) Nigeria Immigration Services (NIS) (6) Nigeria Army (NA) (7) Nigeria Navy (NN) (8) Nigeria Police Force (NPF) (9) Nigerian Institute of Medical Research (NIMR) (10) Federal Airport Authority of Nigeria (FAAN)

(11) Aviation Medical Clinic (Nurses & Doctors) (12) Nigerian Ports Authority (NPA) and (13) Power Holding Company PLC.

### Population

The population is the entire workers in both public and private accident-prone organisations in Lagos state, Nigeria.

### Sample Size

The sample size is six hundred (600), comprising 300 male and 300 female participants drawn from the selected twenty-six private and public organisations.

### Sampling technique

Multi-Stage and Stratified randomisation sampling techniques were applied using the three occupational cadres or levels, namely; Junior, Middle and Senior based on their salary grade levels. Grade levels 1-7 are junior staff; grade levels 8-10 are Middle staff, while grade level 11 and above are senior staff. The number, gender and cadre of participants sampled from each type of organization are represented in figures 5 and 6 respectively.



300 participants

Private Organisations



50 female

50 male

100 Junior



50 female

50 male

100 Middle



100 Senior

50 female

50 male

Figure 5: Sample Distribution of Private Sector Organisations Source: Field Work (The Researcher).

50 male

Figure 6: Sample Distribution of Public Sector Organisations Source : Field Work (The Researcher)



100 Senior

50 female

50 male

50 female

50 male

50 female

100 Junior

100 Middle

300 participants

Public Organisations



Each cadre in both organisations therefore consisted of two hundred (200) participants (that is, junior = 200: middle = 200 and senior = 200), or one hundred (100) participants representing each cadre in each of the organisational types.

Also, equal gender distribution of 300 male participants and 300 female participants in both organisational types, or 150 male participants and 150 female participants in each organisational type; or 50 male participants and 50 female participants in each cadre and in each organisational type were considered. The questionnaire booklets were thus labeled and shared to reflect the stratification order before proceeding to the field for administration in the Phase II assessment study. With this pre-arrangement, it was easy for the Human resources managers/Personnel managers/ Administrative managers in some of these organisations where official permissions were secured to either use their payroll lists, staff nominal rolls or seniority lists to randomly assign the test booklets, bearing in mind the gender and cadre stratifications labeled on the questionnaire booklets. It was randomly assigned because not all the staff members of each stratum were considered in most case.

### Sample Characteristics

The sample characteristics are reflected in percentages as shown in Table 1:

**Table 1 SAMPLE CHARACTERISTICS AND REPRESENTATION:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| S/N 1. | Organisational Types | Public  300 participants  50 % | Private  300 participants  50 % | \_ | \_ | \_ | Total 600  100 % |
| 2. | Gender | Male 300  50 % | Female 300  50 % | \_ | \_ | \_ | 600  100 % |
| 3. | Age | 18 - 30 yrs  89  14.83 % | 31 – 48 yrs.  448  74 .67 % | 49 – Above  63  10 .5 % | \_ | \_ | 600  100 % |
| 4. | Marital Status | Single 80  13. 33 % | Married 507  84. 5 % | Divorced / Separated 6  1. 0 % | Widow 7  1. 17 % | \_ | 600  100 % |
| 5. | Highest Educational  Qualification | SC/WAEC/GCE O/L 229  38. 17 % | OND/NCE/A/L 138  23. 0 % | HND/B .Sc 186  31. 0 % | M.Sc/Ph.D 47  7. 83 % | \_ | 600  100 % |
| 6. | Cadre | Junior 200  33. 3 % | Middle 200  33. 3 % | Senior 200  33. 3 % | \_ | \_ | 600  100 % |
| 7. | Work Experience | 1 - 5 years  70  11. 67 % | 6 - 10 yrs  102  17. 0 % | 11 - 15 yrs  123  20. 5 % | 16 - 20yrs  139  23. 17 % | 21-35yrs 166  27. 67 % | 600  100 % |
| 8. | Ethnicity | Yoruba 210  35. 0 % | Ibo 127  21. 17 % | Hausa 51  8. 5 % | Others 212  35. 33 % | \_ | 600  100 % |
| 9. | Religious Group. | Christians 510  85. 0 % | Moslems 88  14. 67 % | Traditiona- lists  1  0. 17 % | Others 1  0. 17 % | \_ | 600  100 % |

**Source: Field Work**

* 1. **Research Design**

The research designs used are: (i) Cross sectional survey design and (ii) Ex post facto design.

### Cross -Sectional Survey Design

Psychological instruments (Questionnaires) were used in collecting the appropriate data required for the study and scores obtained were used to establish relationships among the variables under study.

### Ex- Post Factor Design

This design was used to discover and clarify relationships between safety factors and predicted organisational outcomes. Both designs were considered appropriate for the study, because the study is measuring what had already occurred, which cannot subjected to experimental manipulation.

### Research Instruments

The following seven research instruments were used in collecting data:

### Bio- Data Questionnaire (BDQ)

This BDQ was constructed by the researcher to obtain information concerning the participants‟ gender, age, marital status, job tenure or work experience, highest educational qualification, religion, ethnicity, job position or cadre and nature of work their organisations perform.

### Situation Awareness Questionnaire (SAQ)

These are fifty three (53) self-descriptive items developed and validated in the course of this study to measure the situation awareness of employees in the work organisations. The three components of this scale established through factor analysis, which formed the composite scale are: (1) Employees‟ Comprehension of Safety Information and Projection (ECSIP), (2) Employees‟ Attitude to Safety Consciousness (EASC) and (3) Employees‟ Safety Perception (ESP). Situation Awareness Questionnaire (SAQ) as a composite scale has Cronbach Alpha internal consistency reliability coefficient of 0.76; Spearman-Brown (odd and even) 0.76 and Guttman Split-half 0.70 obtained by Osuagwu, Sote & Omoluabi (2005). SAQ was correlated with Offshore Safety Questionnaire (OSQ) developed by

Rundmo (1994) to obtain a concurrent validity coefficient of 0.77. Likert response format was adopted for this test.

### Safety Management Practices Questionnaire (SMPQ)

This is a fifty-five (55) item inventory developed and validated in this study to measure the safety management practices in industries and work organisations. It comprises extracts from Offshore Safety Questionnaire (OSQ) developed by Rundmo (1994) and relevant information from the literature. SMPQ as a composite scale has Cronbach Alpha internal consistency reliability coefficient of 0.87, Spearman-Brown (odd-even) reliability coefficient of 0.91 and Guttman Split-half of 0.91 obtained by Osuagwu, Sote & Omoluabi (2005). They also obtained a concurrent validity coefficient of 0.83 with Offshore safety questionnaire (OSQ) developed by Rundmo (1994). The psychometric properties of the nine sub-scales/components of SMPQ were also obtained. Likert response format was also adopted for this test.

### 4. 4 Organisational Commitment Questionnaires (OCQ)

This is a twenty-three (23) item inventory designed by Buchanan (1974) to assess the extent to which a worker is affectively attached to the achievement of the goals and values of an organization.The three components of commitment (OCQ) include: (a) Identification, (b) Job Involvement and (c) Loyalty. Buchanan (1974) reported coefficients Alpha of 0.86, 0.84, 0.92 for the three components respectively, and 0.94 for the composite scale of OCQ. Cook and Wall (1980) correlated OCQ with overall Job satisfaction and obtained a concurrent validity coefficient of 0.62. Osuagwu, Sote and Omoluabi, (2005) correlated OCQ with job involvement to obtain a concurrent validity coefficient of 0.55. They also obtained a concurrent validity coefficient of 0.49 between

OCQ and Organisational Effectiveness Questionnaire (OEQ). Mogaji (1997) provided psychometric properties with Nigerian samples.

### Job Involvement Questionnaire (JIQ)

The Job Involvement Questionnaire is a twenty (20) item inventory designed by Lodahl and Kejner (1965) to measure the degree of involvement of an individual on a particular job. The researchers reported Spearman-Brown internal reliability coefficient ranging from 0.72 to 0.89. Mogaji (1997) also provided the psychometric properties with Nigerian samples.

### Organisational Effectiveness Questionnaire (OEQ)

This is a test battery of twenty-one (21) items inventory designed by Pennings (1976); Romzek (1989); Shore and Martins (1989) and Gbadamosi (1985) to measure the general behavioural effectiveness of workers in organisations. Osuagwu, Sote and Omoluabi in 2005 revalidated this test with Nigerian samples to obtain Cronbach Alpha reliability coefficient of 0.76; Spearman-Brown (odd and even) reliability coefficient of 0.61 and Guttman Split-half of 0.76 for OEQ test generally. They also correlated OEQ scale with Organisational Commitment Questionnaire (OCQ) developed by Buchanan (1974) and a concurrent validity coefficient of 0.49 was obtained. They further obtained the psychometric properties for the sub-scales of OEQ with Nigerian samples.

### Offshore Safety Questionnaire (OSQ)

Offshore safety questionnaires (OSQ) was developed by Rundmo (1994) for measuring safety in Oil and gas industries in Europe. The psychometric properties of the test were unavailable at the time of this study. However, Offshore safety test was correlated with Situation awareness test (SAQ) and safety management practices (SMPQ) in the present study; and high concurrent validity coefficients of 0.77 and 0.8 respectively were obtained.

### Procedure

The following steps were involved: Construction and validation of test instruments, training of three research assistants, collection of data, standardization study, assessment study, control of test administration and scoring; and data analysis.

### Tests Construction and Validation

To carry out this study, the Situation Awareness Questionnaire (SAQ) and Safety Management Practices Questionnaire (SMPQ) tests were first constructed and validated, while Organisational Effectiveness Questionnaire (OEQ) test was revalidated with Nigerian samples for the purpose of relevance, suitability and enhancement of the test instruments for indigenous studies.

Tests construction followed the necessary steps of:

1. Definition of concepts and domains by reviewing theories and attributes of situation awareness and safety management practices.
2. Evaluation of items by two psychometric experts/judges, including one of the supervisors of this study, who rated the items on their merits for inclusion, thereby establishing both content and face validity.
3. Selecting proper scaling procedures which are in agreement with the summative linear model.
4. The judges further eliminated redundant items, revised and re-worded some, before the tests were finally administered for standardisation study.
5. Data collected were further subjected for both item and factor analyses for the purpose of final validation, hence items that loaded less than 0.25 were considered having very low weights and therefore were eliminated to enhance the reliability and validity of the test instruments.
6. Through reliability and validity analyses, the psychometric properties of the developed instruments were obtained.

### Training of Research Assistants

Three research assistants were hired and trained for two days by the researcher, plus volunteers from various organisations where tests were administered so as to:

(a). understand and obey organisational protocol

(b) establish the needed rapport with workers/participants in- view (c.) have wide knowledge of the instruments of the study

(d) be able to interpret and guide participants on how to complete the tests forms; and (e ) help in scoring test forms according to the rules of the test manuals

### Data Collection

Data collection took the following two phases: PHASE 1 (Standardization of instruments) and PHASE: 2 (Assessment Study). However, before embarking on phases 1 & 2, an introductory letter obtained from the Department of Psychology was given to the

organizations under study. The letter contents detailed out the nature, purpose and significance of the research to enable organisational managements see reasons in offering all the necessary assistance needed in using their staff as participants in the study.

The test forms contained instructions on how to fill them and participants‟ names were not necessary to assure them of the confidentiality of their responses. In addition, only workers on permanent and full time employment with at least one year job experience in their organisations were considered for participation. The processes of collecting data in each of the two phases are enumerated as follows:

## PHASE 1: (STANDARDISATION OF INSTRUMENTS)

### Administration of tests

A total of three hundred (300) copies of the test forms were randomly distributed to three categories of workers (that is, the junior staff, the middle/supervisors and senior staff/managers) comprising male and female participants from the twenty public and private organisations used for the study. The investigator was assisted by the research assistants, Administrative managers/ Human resources managers or the Personnel managers of these organisations; and in some cases, by the Sectional Heads. The senior staff in most cases received their own copies through the managers. Instructions on how to fill the forms were explicitly written on the test forms.

Out of three hundred (300) forms distributed, a total of one hundred and seventy-nine

(179) copies were returned; and out of these, one hundred and thirty (130) copies were properly completed and thus analysed. Generally, this gave a response set of 60 %.

## PHASE II: (ASSESSMENT STUDY)

### Administration of Test Battery

A test battery containing seven different test instruments were randomly distributed to eight hundred (800 ) workers in the three categories of junior, middle and management cadres to achieve a target sample of six hundred (600) participants on equal gender and cadre bases in the main study . The test forms were distributed to individuals and to groups in the twenty-six public and private sector organisations used in this study by the researcher, trained assistants, and volunteers from the organisations (that is, human resources/personnel/administrative managers, and of course some organisational staff). Out of eight hundred (800) copies distributed, seven hundred and thirty (730) were returned, out of which six hundred (600) copies correctly completed, were sorted out and analyzed. This accounted for a response set of 91.25 %

### Control

To avoid contaminations and to ensure validity in the study, participants were instructed on how to complete the questionnaires and the order of presentation was kept constant throughout the study.

### 3.5.4. Scoring of instruments

The same scoring pattern was followed in all the studies (Phase I and Phase II). All scoring patterns complied with the rules stated in each of the test manuals as provided by the authors. The scoring procedures for the developed and re-validated tests are detailed as follows:

### Situation Awareness Questionnaire (SAQ)

These are fifty three (53) self-descriptive items developed and validated in the course of this study to measure the situation awareness of employees in the work organisations. The three components of this scale established through factor analysis, which formed the composite scale are: (1) Employees‟ Comprehension of Safety Information and Projection (ECSIP), (2) Employees‟ Attitude to Safety Consciousness (EASC) and (3) Employees‟ Safety Perception (ESP). Situation Awareness Questionnaire (SAQ) as a composite scale is the summation of the values of the three component factors. Likert response format was adopted for this test, in which participants were to rate how they interact with their work environment as follows:

1 = Strongly Disagree

2 = Disagree

3 = Slightly Disagree 0 = Neutral

5 = Slightly Agree

6 = Agree

7 = Strongly Agree

### Scoring of SAQ

There is direct scoring and reverse scoring of the items.

### Direct Scoring:

Add together the values of the numbers shaded or circled in the relevant items. For example , if in items 1 , 3 , 5 , 7, 10 , 11 , and 12 the numbers circled or marked are 5 , 6 ,

7 , 5 , 4 , 5 , 1 respectively , the score for the seven items is 5+6+7+5+4+5+1 =33

### Reverse Scoring:

In reverse scoring, the values of the numbers are changed from 1 , 2 , 3 , 4 , 5 , 6 , 7 , to 7 , 6 , 5 , 4 , 3 ,2 , 1 respectively , and the reversed values of the numbers marked or circled in the relevant items are now added together . For example , if in items 2 , 5 , 6 , 10 , 15 , 16 , 23 , the marked numbers are 1 ,3 , 7 , 1 , 2 , 4 , 6 respectively , the reverse score for the

seven items will be 7 +5+1+7+6+4+2 =32

### Direct Scoring Items:

Direct scoring items include the following ; 1 ,3 , 4 , 7 , 8 , 9 , 13 , 14 , 17 , 18 , 19 , 20 ,

21 , 22 , 24 , 25 , 29 , 30 , 31 , 33 , 35 , 39 , 41 , 42 , 43 , 45 , 48 , 50 , 51 , and 53 .

### Reverse Scoring Items:

Reverse scoring items include the following ; 2 , 5 , 6 , 10 , 11 , 12 , 15 , 16 ,

23 , 26 , 27 , 28 , 32 , 34 , 36 , 37 , 38 , 40 , 44 , 46 , 47 , 49 , and 52 .

### Items For Each Sub-Scale:

* 1. **ECSIP :** 1 , 3 , 5 , 6 , 11 , 12 , 21 , 22 , 24 , 25 , 26 , 28 , 29 , 30 , 33 , 34 ,

35 , 36 , 41 , 45 , 48 , 49 , 50 , 56 , 58 , 59 and 61 .

* 1. **EASC :** 2 , 13 , 31 , 32 , 38 , 40 , 42 , 43 , 44 , 46 , 51 , 57 and 60 .
  2. **ESP :** 8 , 10 , 15 , 16 , 17 , 18 , 19 , 20 , 27 , 39 , 53 , 54 , and 55
  3. **SAQ Overall:** All the 53 items

1. Put letter **A** by the sides of all ECSIP items; letter **B** by the sides of all EASC items and letter **C** by the sides of all ESP items respectively.
2. Add together the values of all the direct and reverse scores of letter **A** items for ECSIP; letter **B** items for EASC and letter **C** items for ESP, thereby representing each scale .
3. The overall situation awareness (SAQ) score is the addition of the scores/values of the 53 items of the entire scale.

### Safety Management Practices Questionnaire (SMPQ)

This is a fifty-five (55) item inventory developed and validated in this study to measure the safety management practices in industries and work organisations. SMPQ as a composite scale is the summation of the values of the nine sub-scales. Likert response format was also adopted for this test and as a result, participants were to rate how health and safety activities are promoted by their organisational management.

The numbers stand for:

1 = Strongly Disagree

2 = Disagree

3 = Slightly Disagree 0 = Neutral

5 = Slightly Agree

6 = Agree

7 = Strongly Agree

There is direct scoring as well as reverse scoring of items .

### Direct Scoring :

Add together the values of the numbers ticked , circled or shaded in the relevant items . For instance , if in items 1 , 2 , 3 , 5 , 6 , 7 , 8 , 9 , 11 , the values ticked , circled or shaded are 7 , 5 , 3 , 4 , 3 , 1 , 6 , 2 and 5 respectively , the score for the nine items is

7+5+3+4+3+1+6+2+5=36.

### Reverse Scoring :

In reverse scoring , the values of the numbers are changed from 1 , 2 , 3 , 4 , 5 , 6 , 7 to 7

, 6 , 5 , 4 , 3 , 2 , and 1 respectively . The reversed values of the numbers circled or shaded by the participants in the relevant items are added together . For example , if in items 4 , 10 , 14 , 17 , 19 , 22 , 25 , 29 , and 34 , the numbers/values circled , marked or shaded are

1 , 3 , 4 , 2 , 5 , 7 , 6 , 5 , and 2 respectively , the reversed score for the nine items is

7+5+4+6+3+1+2+3+6=37.

### Direct Scoring Items:

The direct scoring items include the following ;

1 , 2 , 3 , 5 , 6 , 7 , 8 , 9 , 11 , 12 , 13 , 15 , 16 , 18 , 20 , 21 , 23 , 24 , 26 , 27 , 28 , 31 , 32 ,

33 , 36 , 40 , 41 , 42 , 43 , 46 , 47 , 48 , 49 , 51 , 52 , and 53 .

### Reverse Scoring Items:

These include the following ; 4 , 10 , 14 , 17 , 19 , 22 , 25 , 29 , 30 , 34 , 35 , 37 , 38 , 39 ,

44 , 45 , 50 , 54 , and 55 .

### The Items for the nine sub- scales:

* 1. HSAIHC : 5 , 6 , 11 , 12 , 26 , 31 , 32 , 42 , 46 , 47 , 48 , 49 , 51 , 52 , and 53
  2. HSPT : 1 , 2 , 7 , 8 , 9 , 15 , and 20 .
  3. LSM :13 , 16 , 28 , 41 , 43 , and 45 .
  4. MAOS :3 ,10 , 21 , 30 , 39 ,and 40 .
  5. EW : 4 , 14 , 17 , 19 , 29 , 33 , 34 , and 44 .
  6. PPEDSS :37 , 38 , 50 , 54 , and 55 .
  7. SPS :18 , 23 , and 24 .
  8. MCS :25 , 27 , and 36 .
  9. SC :22 and 35 .
  10. SMPQ Overall ; All the 55 items in the scale .

1. Put letters A , B , C , D , E , F , G , H , & I by the sides of the items in each scale (SAIHC ; HSPT ; LSM ; MAOS ; EW ; PPEDSS ; SPS ; MCS ; & SC) respectively .
2. Add together the values of all the direct and reverse score items of each of the letters A –I independently for the nine sub-scales.
3. The overall safety management practices score is the sum of all the scores or values of all the 55 items in the SMPQ scale

### Organisational Effectiveness Questionnaires (OEQ)

This a 21 –item inventory designed by Pennings (1976) ; Romzek (1989) ; & Shore & Martins (1989) on a 5-point Likert format ; is a battery of tests measuring behaviourial effectiveness in the achievement of organizational goals .The behavioural measures are considered as the intervening behavioural variables which are chosen not only for their relevance to the independent variables , but because they have wide acceptance and usage in the literature . As previously stated, this test was revalidated with Nigerian sample by Osuagwu , Sote , & Omoluabi , (2005) . Through factor analysis , the following seven components were identified as earlier on stated.

**Scoring :** There is only direct scoring of items .

### (a). Direct Scoring :

Add together the values of the numbers ticked , circled or shaded in the relevant items . For instance , if in items 1 , 2 , 3 , 4 , 5 , 6 , and 9 , the values circled or ticked are 3 , 4 , 5

, 7 , 6 , 2 , and 1 respectively , the score for the seven items is 3+4+5+7+6+2+1 = 28 . All the 21 items in the test are scored directly.

### The Items of the Seven Sub-scales :

* 1. Career Satisfaction (CS) = 3 , 4 , 5 & 6 .
  2. Turnover Intention (TOI) = 12 , 13 , & 15 .
  3. Organizational Goal (OG) = 2 , 18 , & 19 .
  4. Interpersonal Relation (IPR) = 20 , & 21 .
  5. Non-Work Satisfaction (NWS) = 1 , 7 , 8 & 9 .
  6. Work-Place Anxiety (WPA) = 14 , 16 , & 17 .
  7. Moral (M) = 10 & 11 .
  8. OEQ Overall : All the 21 items of the scales .

1. Put letters A, B , C , D , E , F , & G by the sides of the items in each scale (CS ; TOI ; OG ; IPR ; NWS ; WPA ; & M ) respectively.
2. Add directly together the values circled or sha ded against the items for each of the letters (A – G ) independently for the seven scales .
3. The overall Organizational Effectiveness measure (OEQ ) is the addition of all the scores or values of the 21 items of the scale / test .

### 3.5.5 Data Analysis

The Statistical Package for Social Science (SPSS) version 17.05 was used. The following statistics were applied in analysing the data obtained by assessing participants on the measured variables; determine factors constituting the validated instruments; comparing relationships between/ among variables and determining effects of independent variables on dependent variables:

1. Means and standard deviations;
2. Principal axis factor analyses;
3. Pearson Inter-Product Moment correlations;
4. Multiple regression analyses;
5. Discriminant analyses;
6. One- Way Analysis of Variance and
7. Independent t-tests.

## CHAPTER FOUR

**RESULTS**

This chapter presents and interprets the entire results of the study, which are divided into three sections, namely: (1) Standardisation of research instruments, (2) Assessment study results, and (3) Hypotheses testing results. The standardisation results include item analyses, factor analyses and reliability analyses of the two test instruments developed and validated, and the old existing test revalidated. The assessment study results include all the validity analyses, mean and standard deviation scores and correlation matrices, while Hypotheses results include all the results of the hypotheses tested.

* 1. **PHASE 1: STANDARDISATION: (Factor Analyses Results of Situation Awareness, Safety Management Practices and Organisational Effectiveness Tests):**
     1. **: PRINCIPAL COMPONENT ANALYSIS OF SITUATION AWARENESS VARIABLES.**

**TABLE 2: Eigenvalues and Variance Contribution of Three Component Factors Extracted from Situation awareness test (Rotation Sums of Squared Loadings)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Factors** | **Eigenvalues** | **% Variance** | **Cumulative %** |
| 1 ECSIP | 5.383 | 8.682 | 8.682 |
| 2 EASC | 3.971 | 6.405 | 15.087 |
| 3 ESP | 3.810 | 6.145 | 21.232 |
| **Total** | **13.164** | **21.232** | **21.232** |

The results of the principal component factor analysis (extraction method) of the 62 items of Situation Awareness test (SAQ) showed that only three principal factors were extracted based on their clusters and eigenvalues. The factors include the following: (1) Employees‟ Comprehension of Safety Information and Projection (ECSIP); (2) Employees‟ Attitudes to Safety Consciousness (EASC) and (3) Employees‟ Safety Perception (ESP).

The eigenvalues attached to the three principal factors in Table 2 above ranged in order of magnitude from 3.81 to 5.38, thereby accounting for a total of 13.16 eigenvalues and

21.23% of total variance contributions to this scale. Factor 1 is the most dominant factor with 5.38 as the eigenvalue and contributing 8.68% to the total variance of the scale. Factor 2 has 3.97 as the eigenvalue and it contributed 6.41% to the total variance of the scale, while Factor 3 has 3.81 as the eigenvalue with 6.15% contributions to the total variance of the SAQ scale.

## PRINCIPAL COMPONENT ANALYSIS OF SAFETY MANAGEMENT PRACTICES VARIABLES:

**TABLE 3: Eigenvalues and Percentage Variance Contributions of The Nine Principal Component Factors Extracted from SMPQ Test (Rotation Sums of Squared Loadings)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Component** | **Eigenvalue** | **% OF Variance** | **Cumulative %** |
| 1 SAIHC | 6.702 | 12.186 | 12.186 |
| 2 HSPT | 3.259 | 5.926 | 18.112 |
| 3 LSM | 3.176 | 5.774 | 23.886 |
| 4 MAOS | 3.038 | 5.523 | 29.409 |
| 5 EW | 2.705 | 4.919 | 34.328 |
| 6 PPEDSS | 2.599 | 4.725 | 39.053 |
| 7 SPS | 2.593 | 4.715 | 43.768 |
| 8 MCS | 2.578 | 4.688 | 48.456 |
| 9 SC | 1.843 | 3.350 | 51.806 |
| **Total** | **28.493** | **51.806** | **51.806** |

The nine principal factors extracted are: (1) Safety audit, inspection and hazard control (SAIHC) (2) Health and safety policies and training (HSPT) (3) Leadership and safety motivation (LSM) (4) Managerial attitude to organisational safety (MAOS) (5) Employees‟ welfare (EW) (6) Provision of protective equipment and development of supervisors‟ skills (PPEDSS) (7) Safety promotion and surveillance (SPS) (8) Management commitment to safety (MCS) and (9) Safety communication (SC).

From Table 3 above, it could be observed that the nine principal components extracted had a total of 28.49 as the eigenvalue and a total of 51.81% contribution to the total variance of the SMPQ variables, while the rest of 46 items contributed 48.19 % of the total variance.

This by implication shows the appropriateness of the SMPQ as a reliable instrument of measure in the study.

* + 1. **PRINCIPAL COMPONENT FACTOR ANALYSIS OF ORGANISATIONAL EFFECTIVENESS VARIABLES:**

**Table 4: Eigen Value and Variance Contribution of the Seven Component Factors Extracted from OE Test (Rotation Sums of Squared Loadings)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Factor** | **Eigen Value** | **% Of Variance** | **Cumulative %** |
| 1 CS | 2.396 | 11.410 | 11.410 |
| 2 TOI | 2.325 | 11.071 | 22.481 |
| 3 OG | 2.254 | 10.732 | 33.213 |
| 4 IPR | 1.867 | 8.890 | 42.102 |
| 5 NWS | 1.840 | 8.761 | 50.864 |
| 6 WPA | 1.803 | 8.585 | 59.448 |
| 7 M | 1.650 | 7.856 | 67.304 |
| **TOTAL** | **14.14** | **67.31** | **67.304** |

The seven principal component factors extracted during revalidation of Organisational effectiveness questionnaire are: (1) Career satisfaction (CS) (2) Turnover Intention (TOI)

(3) Organisational goal (OG) (4) Interpersonal relationship (IPR) (5) Non- work satisfaction (NWS) (6) Workplace anxiety (WPA) and (7) Morale (M).

The results showed that the seven principal components extracted by varimax rotation method were based on their clusters and eigenvalues. The Eigenvalues attached to the seven principal component factors ranged in order of magnitude from 1.65 to 2.40; thereby accounting for a total of 14.14 eigenvalues and contributing 67.31% of the total variance of OE variables. The percentage variance contribution of the seven principal component factors to Organisational effectiveness test variables is high enough to predict the appropriateness of the instrument. The seven components extracted are in agreement with those of the original authors.

## RELIABILITY ANALYSES OF SITUATION AWARENESS, SAFETY MANAGEMENT PRACTICES AND ORGANISATIONAL EFFECTIVENESS TESTS:

### Table 5 : Summary of Reliability Coefficient Results of SAQ,SMPQ and OEQ Tests.

|  |  |  |  |
| --- | --- | --- | --- |
| **TEST & SUB-TEST** | **CRONBACH ALPHA REL.COEFFICIENT** | **GUTTMAN SPLIT-HALF** | **SPEARMAN— BROWN** |
| **ECSIP** | **0.81** |  |  |
| **EASC** | **0.64** |  |  |
| **ESP** | **0.61** |  |  |
| **SAQ** | **0.76** | **0.70** | **0.76** |
| **HSAIHC** | **0.89** |  |  |
| **HSPT** | **0.80** |  |  |
| **LSM** | **0.75** |  |  |
| **MAOS** | **0.66** |  |  |
| **EW** | **0.63** |  |  |
| **PPEDSS** | **0.61** |  |  |
| **SPS** | **0.49** |  |  |
| **MCS** | **0.63** |  |  |
| **SC** | **1.00** |  |  |
| **SMPQ** | **0.87** | **0.91** | **0.91** |
| **Career Satisfaction(CS)** | **0.78** |  |  |
| **Turnover Intention(TOI)** | **-0.75** |  |  |
| **Organisational Goal(OG)** | **0.66** |  |  |
| **Interpersonal Relations(IPR)** | **0.80** |  |  |
| **Non-Work Satisfaction(NWS)** | **0.66** |  |  |
| **Work-place Anxiety(WPA)** | **0.51** |  |  |
| **Morale(M)** | **0.18** |  |  |
| **OEQ** | **0.76** | **0.76** | **0.61** |

The reliability analyses of the three tests (SAQ, SMPQ & OEQ) were carried out by using Guttman Split-half method (odd versus even): Spearman Brown to ensure even spread of items in terms of their discriminative ability and Cronbach Alpha internal consistency method were applied to the entire tests, as well as their sub-tests to ascertain the internal consistency of the instruments.

That separate reliability estimates were computed for each of the sub-scales was another form of supplying detailed information on the reliability of the entire tests. It is also important to note that with the large sample of participants used for the validation study, the reliability coefficients obtained are high enough to conclude that the three tests are highly reliable instruments for measuring situation awareness, safety management practices and organisational effectiveness in the organisations respectively.The reliability coefficient results obtained are shown in Table 5 above.

### PHASE 2: Assessment Study

**TABLE 6 : MEAN AND STANDARD DEVIATION SCORES OF PARTICIPANTS ON ALL THE MEASURES: PHASE II:**

**(ASSESSMENT STUDY)**

|  |  |  |  |
| --- | --- | --- | --- |
| **S/N** | **Measure** | **Mean** | **Std.D** |
| 1 | ECSIP | 136.38 | 20.67 |
| 2 | EASC | 56.80 | 29.08 |
| 3 | ESP | 64.95 | 10.89 |
| 4 | SAQ-T | 257.78 | 40.89 |
| 5 | HSAIHC | 59.43 | 15.97 |
| 6 | HSPT | 29.88 | 9.23 |
| 7 | LSM | 22.25 | 7.11 |
| 8 | MAOS | 20.55 | 6.13 |
| 9 | EW | 31.27 | 9.33 |
| 10 | PPEDSS | 16.18 | 5.40 |
| 11 | SPS | 12.22 | 3.90 |
| 12 | MCS | 12.49 | 4.46 |
| 13 | SC | 7.41 | 2.60 |
| 14 | SMP | 229.89 | 53.14 |
| 15 | CS | 14.17 | 4.11 |
| 16 | TOI | 9.08 | 4.11 |
| 17 | OG | 9.92 | 2.77 |
| 18 | IPR | 6.80 | 2.10 |
| 19 | NWS | 15.73 | 3.26 |
| 20 | WPA | 7.70 | 2.57 |
| 21 | M | 8.01 | 2.03 |
| 22 | OE | 75.35 | 23.46 |
| 23 | JI | 70.99 | 23.46 |
| 24 | OC | 104.82 | 19.06 |

## N = 600

Table 6 above shows the mean and standard deviation scores of the participants on all the measures.

**Table 7: ORGANISATIONAL MEAN AND STANDARD DEVIATION SCORES**

**ON THE MEASURES (PHASE II: ASSESSMENT STUDY)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **MEASURE** | **PUBLIC ORGN** | | **PRIVATE ORGN** | |
| **Mean** | **Std. D** | **Mean** | **Std.D** |
| 1. | ECSIP | 133.16 | 20.313 | 139.60 | 20.559 |
| 2. | EASC | 55.59 | 12.260 | 58.01 | 39.253 |
| 3. | ESP | 63.57 | 10.346 | 66.33 | 11.252 |
| 4. | SAQ | 253.23 | 33.150 | 262.33 | 46.997 |
| 5. | SMPQ | 226.21 | 48.440 | 233.57 | 57.307 |
| 6. | OCQ | 105.11 | 19.564 | 104.53 | 26.290 |
| 7. | JI | 70.58 | 9.83 | 71.41 | 9.78 |
| 8 | OEQ | 74.21 | 10.17 | 76.50 | 31.57 |

## N = 300

The table above shows that private sector organisations had higher mean scores than the public sector organisations in all the measures except in organisational commitment.

**TABLE 8: GENDER MEAN AND STANDARD DEVIATION SCORES ON ALL THE MEASURES (PHASE II: ASSESSMENT STUDY)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **MEASURES** | **GENDER** | | | |
| **MALE** | | **FEMALE** | |
| **Mean** | **Std. D** | **Mean** | **Std. D** |
| 1 | ECSIP | 137.73 | 20.59 | 135.03 | 20.70 |
| 2 | EASC | 58.56 | 39.31 | 55.04 | 11.94 |
| 3 | ESP | 65.56 | 11.11 | 64.35 | 10.64 |
| 4 | SAQ | 260.05 | 46.49 | 255.51 | 34.32 |
| 5 | HSAIHC | 58.54 | 16.20 | 60.51 | 15.77 |
| 6 | HSPT | 29.82 | 9.86 | 29.95 | 8.50 |
| 7 | LSM | 21.11 | 7.30 | 23.61 | 6.69 |
| 8 | MAOS | 19.92 | 5.46 | 21.31 | 6.81 |
| 9 | EW | 31.18 | 10.18 | 31.37 | 8.28 |
| 10 | PPEDSS | 16.14 | 5.46 | 16.22 | 5.38 |
| 11 | SPS | 12.17 | 4.02 | 12.29 | 3.77 |
| 12 | MCS | 12.63 | 4.40 | 12.32 | 4.57 |
| 13 | SC | 7.20 | 2.48 | 7.66 | 2.74 |
| 14 | SMP | 227.56 | 58.21 | 232.21 | 47.53 |
| 15 | CS | 14.03 | 4.27 | 14.34 | 3.94 |
| 16 | TOI | 8.73 | 1.97 | 9.49 | 1.69 |
| 17 | OG | 9.68 | 2.70 | 10.22 | 2.86 |
| 18 | IPR | 6.65 | 2.19 | 7.00 | 1.98 |
| 19 | NWS | 15.82 | 2.66 | 15.63 | 3.89 |
| 20 | WPA | 7.51 | 2.51 | 7.93 | 2.31 |
| 21 | M | 7.93 | 1.94 | 8.10 | 2.14 |
| 22 | OE | 73.95 | 10.59 | 76.76 | 31.41 |
| 23 | JI | 71.48 | 9.44 | 70.51 | 10.15 |
| 24 | OC | 105.98 | 25.41 | 103.66 | 20.64 |

**N = 300**

Male employees had higher mean scores in situation awareness than their female counterparts, while the female employees rated their organisations higher on safety management practices. Male employees in the organisations scored higher than the female employees on organisational commitment and job involvement. Male employees had mean scores of 105.98 and 71.48 as against 103.66 and 70.51 for female employees on organisational commitment and job involvement respectively. However, female employees scored higher than the male employees on organisational effectiveness (that is, 76.76 against 73.95 respectively).

### Table 9: CADRE MEAN AND STANDARD DEVIATION SCORES ON THE MEASURES: (PHASE II: ASSESSMENT STUDY)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SN** | **MEASURE** | **JUNIOR** | | **MIDDLE** | | **SENIOR** | |
| Mean | Std. D | Mean | Std. D | Mean | Std. D |
| 1. | ECSIP | 135.47 | 21.254 | 136.35 | 19.245 | 137.33 | 21.507 |
| 2. | EASC | 53.29 | 11.178 | 57.59 | 11.317 | 59.53 | 47.663 |
| 3. | ESP | 63.41 | 10.684 | 65.96 | 10.775 | 65.49 | 11.087 |
| 4. | SA | 252.43 | 30.074 | 262.24 | 54.007 | 258.67 | 34.083 |
| 5. | SMP | 234.34 | 46.593 | 226.76 | 51.295 | 228.56 | 60.558 |
| 6. | OC | 104.58 | 20.093 | 104.37 | 26.563 | 105.52 | 22.445 |
| 7. | JI | 70.66 | 10.05 | 70.71 | 9.24 | 71.62 | 10.12 |
| 8. | OE | 75.61 | 9.520 | 76.18 | 38.051 | 74.28 | 10.776 |

**N = 200**

The middle cadre employees scored higher on situation awareness than the senior and junior cadres having the mean score of 262.24 against 258.67 and 252.43 for senior and junior cadres respectively. On the other hand, the junior employees rated their organisations higher than the senior and middle cadres on safety management practices.

* 1. **VALIDITY ANALYSES OF SITUATION AWARENESS; SAFETY MANAGEMENT PRACTICES AND ORGANISATIONAL EFFECTIVENESS TESTS: (ASSESSMENT STUDY)**

### Validity of Situation Awareness Test:

The first observation for the validity of SAQ was derived essentially from its ability to discriminate between positive and negative items, thereby performing according to theoretical expectations during the standardization study, hence divergent and construct validities respectively. The following concurrent validity coefficients were achieved by correlating SAQ and its sub-tests with offshore safety test (OSQ) developed by Rundmo

(1994): OSQ & SAQ=0.77; OSQ & ECSIP = 0.51; OSQ & EASC = 0.21; and OSQ &

ESP = 0.60. This is shown on Table 10 below.

### Table 10: Summary of Pearson‘s ‗r‘ of Inter- Correlation Matrix of Situation Awareness Measures and Offshore safety test:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **ECSIP** | **EASC** | **ESP** | **SAQ** | **OSQ** |
| **ECSIP** | **1** |  |  |  |  |
| **EASC** | **0.07** | **1** |  |  |  |
| **ESP** | **0.41\*\*** | **0.21\*\*** | **1** |  |  |
| **SAQ** | **0.59\*\*** | **0.22\*\*** | **0.65\*\*** | **1** |  |
| **OSQ** | **0.51\*\*** | **0.21\*\*** | **0.60\*\*** | **0.77\*\*** | **1** |

**N= 600**

## \*\* P < 0.01 .

### Validity of Safety Management Practices Test:

SMP test and the sub-tests were correlated with Offshore Safety Questionnaires (OSQ) developed by Rundmo (1994), and the following concurrent validity coefficients were obtained: OSQ & HSAIHC = 0.70; OSQ & HSPT = 0.61; OSQ & LSM = 0.72; OSQ & MAOS = 0.48; OSQ & EW= 0.72; OSQ & PPEDSS = 0.71; OSQ & SPS = 0.60; OSQ & MCS = 0.54; OSQ & SC = 0.43 and OSQ & SMPQ = 0.8.

### TABLE 11(a): Summary of Pearson‘s ‗r‘ of Inter- Correlation Matrix of Safety Management Practices Measures and Offshore Safety test (Assessment Study).

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **Measures** | **EW** | **HSAIHC** | **HSPT** | **LSM** | **MAOS** | **MCS** | **SC** | **PPEDSS** | **SPS** | **SMPQ** | **OSQ** |
| 1 | EW | 1 |  |  |  |  |  |  |  |  |  |  |
| 2 | HSAIHC | .345\*\* | 1 |  |  |  |  |  |  |  |  |  |
| 3 | HSPT | .256\*\* | .568\*\* | 1 |  |  |  |  |  |  |  |  |
| 4 | LSM | .299\*\* | .612\*\* | .529\*\* | 1 |  |  |  |  |  |  |  |
| 5 | MAOS | .371\*\* | .268\*\* | .251\*\* | .279\*\* | 1 |  |  |  |  |  |  |
| 6 | MCS | .384\*\* | .522\*\* | .400\*\* | .394\*\* | .197\*\* | 1 |  |  |  |  |  |
| 7 | SC | .361\*\* | .132 | .006 | .272\*\* | .044 | .230\*\* | 1 |  |  |  |  |
| 8 | PPEDSS | .332\*\* | .189\* | .162 | .107 | .368\*\* | .072 | .226\*\* | 1 |  |  |  |
| 9 | SPS | .239\*\* | .372\*\* | .429\*\* | .450\*\* | .206\* | .334\*\* | .061 | .164 | 1 |  |  |
| 10 | SMP | .579\*\* | .759\*\* | .562\*\* | .707\*\* | .413\*\* | .600\*\* | .213\* | .343\*\* | .428\*\* | 1 |  |
| 11 | OSQ | .722\*\* | .702\*\* | .612\*\* | .721\*\* | .478\*\* | .542\*\* | .432\*\* | .710\*\* | .595\*\* | .831\*\* | 1 |

**N= 600**

**\*\*P < 0.01**

**\* P < 0.05**

Table 11(a) shows the correlation matrix of the nine sub-scales of the SMP test, the entire SMP test and offshore safety questionnaire. The highest significant correlation among the sub-scales of the SMP test was noted between LSM and HSAIHC =0 .61\*\*, followed by 0.57\*\* correlation coefficient between HSPT and HSAIHC (all sig. at p < 0.01 level (2- tailed).

Furthermore, when the entire SMP test was correlated with the sub-tests, all the sub-tests had significant positive correlation with the entire test. The highest correlation coefficient between the SMP test and its sub-tests was observed between SMP and HSAIHC =0

.76\*\*, followed by 0 .71\*\* between SMP and LSM and thirdly, between SMP and MCS = 0 .60\*\* (all sig. at p < 0.01 levels (2-tailed).

The general implication of the results on Table 11(a) above is that all the component factors of SMP test are in agreement with one another, consistently reliable, positively focussed and directed towards achieving a common goal of measuring safety management practices in any work organization.

### Validity of Organisational Effectiveness Test:

Organisational effectiveness test and its sub-scales were correlated with organisational commitment test developed by Buchanan (1974), and the following concurrent validity coefficients were obtained: (1).Career Satisfaction (CS) = 0.35\*\*; (2) Turnover Intention (TOI) = 0.39\*\*; (3) Organisational Goal (OG) = 0.32\*\*; (4) Interpersonal Relation (IPR)

= 0.35\*\*; (5) Non-Work Satisfaction (NWS) = 0.36\*\*; (6) Work -Place Anxiety (WPA) = 0.00; (7) Morale (M) = 0.22\*\* and (8.) Organisational Effectiveness Overall = 0.49\*\*.

### Table 11(b) Summary of Pearson‘s ‗r‘ Inter-Correlation Matrix of Organisational Effectiveness and Organisational Commitment.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **Measure** | **CS** | **TOI** | **OG** | **IPR** | **NWS** | **WPA** | **M** | **OE** | **OC** |
| **1.** | **CS** | **1** |  |  |  |  |  |  |  |  |
| **2.** | **TOI** | **.320\*\*** | **1** |  |  |  |  |  |  |  |
| **3.** | **OG** | **.425\*\*** | **.413 \*\*** | **1** |  |  |  |  |  |  |
| **4.** | **IPR** | **.362\*\*** | **.413\*\*** | **.455\*\*** | **1** |  |  |  |  |  |
| **5.** | **NWS** | **-306\*\*** | **194\*** | **.368\*\*** | **.250\*\*** | **1** |  |  |  |  |
| **6.** | **WPA** | **.-069** | **.069** | **.-073** | **.-068** | **.026** | **1** |  |  |  |
| **7.** | **M** | **.154** | **.165** | **.239\*\*** | **.123** | **.312\*\*** | **-.138** | **1** |  |  |
| **8** | **OE** | **.683\*\*** | **.559\*\*** | **.730\*\*** | **.605\*\*** | **.647\*\*** | **.080** | **.402\*\*** | **1** |  |
| **9.** | **OC** | **.352\*\*** | **.394\*\*** | **.319\*\*** | **.345\*\*** | **.350\*\*** | **.003** | **.216\*\*** | **.485\*\*** | **1** |

**N = 600**

**\*\* P < 0.01**

**\* p < 0.05**

The result indicates significant positive correlation r = 0.49\*\* between Organisational Effectiveness (OE) and Organisational Commitment (OC) at p <0.01(2-Tailed).

## TABLE 12 : CORRELATION MATRIX OF ALL THE MEASURES ( PHASE II

**:ASSESSMENT STUDY):**

**S/N**

**MEASURES**

**EW**

**HSAIHC**

**HSPT**

**LSM**

**MAOS**

**MCS**

**SC**

**PPEDSS**

**SPS**

**SMPQTOTAL**

**EASC**

**ECSIP**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | EW | 1 | \*\* | \*\* | \*\* | \*\* | \*\* | \*\* | \*\* | \*\* | \*\* |  | \*\* |
| 2 | HSAIC | .345\*\* | 1 | \*\* | \*\* | \*\* | \*\* |  | \* | \*\* | \*\* |  | \*\* |
| 3 | HSPT | .256\*\* | .568\*\* | 1 | \*\* | \*\* | \*\* |  |  | \*\* | \*\* |  | \*\* |
| 4 | LSM | .299\*\* | .612\*\* | .529\*\* | 1 | \*\* | \*\* | \*\* |  | \*\* | \*\* |  | \*\* |
| 5 | MAOS | .371\*\* | .268\*\* | .251\*\* | .279\*\* | 1 | \* |  | \*\* | \* | \*\* |  |  |
| 6 | MCS | .384\*\* | .522 | .400\*\* | .394\*\* | .197\* | 1 | \*\* |  | \*\* | \*\* |  | \*\* |
| 7 | SC | .361\*\* | .132 | .006 | .272\*\* | .044 | .230\*\* | 1 | \*\* |  | \* |  |  |
| 8 | PPEDSS | .332\*\* | .189\* | .162 | .107 | .368\*\* | .072 | .226\*\* | 1 |  | \*\* | \* |  |
| 9 | SPS | .239\*\* | .372\*\* | .429\*\* | .450\*\* | .206\* | .334\*\* | .061 | .164 | 1 | \*\* |  | \*\* |
| 10 | SMPQ | .579\*\* | .759\*\* | .562\*\* | .707\*\* | .413\*\* | .600\*\* | .213\* | .343\*\* | .428\*\* | 1 |  | \*\* |
|  | TOTAL |  |  |  |  |  |  |  |  |  |  |  |  |
| 11 | EASC | .102 | -.024 | .059 | .012 | .115 | .021 | .058 | .187\* | -.100 | .031 | 1 |  |
| 12 | ECSIP | .226\*\* | .280\*\* | .360\*\* | .232\*\* | .158 | .274\*\* | -.016 | .114 | .316\*\* | .307\*\* | -.056 | 1 |
| 13 | ESP | .255\*\* | .054 | .030 | .035 | .079 | .110 | .148 | .017 | -.043 | .100 | .293\*\* | .247\*\* |
| 14 | SAQ | .281\*\* | .153 | .288\*\* | .110 | .195\* | .192\* | -.037 | .131 | .164 | .212\* | .333\*\* | .742\*\* |
|  | TOTAL |  |  |  |  |  |  |  |  |  |  |  |  |
| 15 | SC | .119 | .429\*\* | .271\*\* | .384\*\* | .095 | .312\*\* | .253\*\* | .076 | .197\* | .352\*\* | .198\* | .172 |
| 16 | TOI | .119 | .280\*\* | .177\* | .202\* | .035 | .116 | .197\* | -.052 | .135 | .167 | .053 | .111 |
| 17 | OG | .253\*\* | .255\*\* | .161 | .395\*\* | .099 | .142 | .215\* | .033 | .288\*\* | .254\*\* | .054 | .098 |
| 18 | IPR | .176\* | .201\* | .163 | .215\* | .212\* | .242\*\* | .181\* | .201\* | .218\* | .251\*\* | .093 | .121 |
| 19 | NWS | .129 | .037 | .079 | .156 | -.091 | .182\* | .148 | -.083 | .121 | .058 | .178\* | .208\* |
| 20 | WPA | -.108 | -.024 | -.066 | -.057 | -.222\* | -.238\*\* | -.050 | -.273\*\* | .031 | -.153 | -.108 | .042 |
| 21 | M | .086 | .021 | -.020 | .062 | -.119 | .145 | .114 | .010 | .211\* | -.001 | .127 | .113 |
| 22 | OEQ | .239\*\* | .292\*\* | .187\* | .320\*\* | -.012 | .274\*\* | .231\*\* | .010 | .303\*\* | .253\*\* | .115 | .238\*\* |
|  | TOTAL |  |  |  |  |  |  |  |  |  |  |  |  |
| 23 | JI | .169 | .098 | .095 | .033 | -.029 | .117 | -.030 | .066 | -0.26 | .128 | .198\* | .345\*\* |
| 24 | OC | .311\*\* | .348\*\* | .207 | .288\*\* | .142 | .292\*\* | .112 | .085 | .196\* | .298\*\* | .141 | .367\*\* |

**N = 600**

\* **P < 0.05**

\*p**< 0.01**

Table 12 above is the correlation matrix of all the 24 measures in the study, in which the highest correlation was obtained between Safety management practices test (SMPQ) and its sub–test (Health and Safety audit, inspection and hazard control (HSAIHC) = 0.76\*\*; followed by 0.74\*\* between Situation awareness (SAQ) and the sub-test (Employees‟ comprehension of safety information and projection (ECSIP), all sig. at p < 0.01 level (2- Tailed), while the least correlation coefficient was obtained between Morale and Safety management practices r = -0.00.

## TEST OF HYPOTHESES

Six hypotheses were postulated for this study:

### Hypothesis One

There will be significant positive correlations between situation awareness and safety management practices in the selected Nigerian work organisations.

To test for this hypothesis, Pearson Product Moment Correlation Method was applied and the results obtained are reflected in the matrix Tables 13(a), 13(b) & 13(c) below.

**Table 13(a): Summary of Pearson‘s ‗r‘ Inter-Correlation Matrix of Situation Awareness measures (Sub-Tests and Entire Test (Assessment Study):**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MEASURE** | **ECSIP** | **EASC** | **ESP** | **SAQ** |
| ECSIP | 1 |  |  |  |
| EASC | 0.07 | 1 |  |  |
| ESP | 0.41\*\* | 0.21\*\* | 1 |  |
| SA | 0.59\*\* | 0.22\*\* | 0.65\*\* | 1 |

**N=600**

**\*P<0.05**

**\*\* P < 0.01**

From Table 13 (a) above, it could be observed that all the sub-tests of situation awareness correlated positively with one another. For instance, ECSIP and EASC positively correlated r = 0.07; ECSIP and ESP had significant positive correlation (r = 0.41\*\*);

EASC and ESP significantly correlated r = 0 .21\*\*.

Furthermore, the entire test of situation awareness (SA) had significant positive correlation with each of the three sub-tests. For instance, the correlation coefficients between SA and ECSIP r = 0.59\*\*; SA and EASC r = 0.22\*\*; and finally, between SA and ESP r = 0.65\*\* (all sig. at P < 0.01).

This outcome is consistent with what was obtained in the standardisation of research instrument, where Situation awareness main test (SA) positively and significantly correlated with each of the three sub- tests (Example, SA & ECSIP = 0.74\*\*; SA & EASC

= 0 .33\*\*; and SA & ESP = 0.57\*\*( all sig. at p < 0.01) .

In the final analysis, it could be stated that the significant positive correlations obtained among the sub-tests of situation awareness on one hand, and between the main test (SA) and each of the sub-tests on other hand, confirmed the homogeneity of the test, hence hypothesis (1) which stipulates that there will be positive correlations between situation awareness sub-tests and the entire tests is confirmed.

### Table 13(b): Summary of Pearson‘s ‗r‘ Inter-Correlation Matrix of Safety Management Practices Measures (Sub-Tests and Entire Test).

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **MEASUR E** | **EW** | **HSAIH C** | **HSPT** | **LSM** | **MAO S** | **MCS** | **SC** | **PPEDS S** | **SPS** | **SMPQ- T** |
| 1. | EW | 1 |  |  |  |  |  |  |  |  |  |
| 2. | HSAIHC | .345\*\* | 1 |  |  |  |  |  |  |  |  |
| 3. | HSPT | .256\*\* | .568\*\* | 1 |  |  |  |  |  |  |  |
| 4. | LSM | .299\*\* | .612\*\* | .529\*\* | 1 |  |  |  |  |  |  |
| 5. | MAOS | .371\*\* | .268\*\* | .251\*\* | .279\*\* | 1 |  |  |  |  |  |
| 6. | MCS | .384\*\* | .522\*\* | .400\*\* | .394\*\* | .197\* | 1 |  |  |  |  |
| 7. | SC | .361\*\* | .132 | .006 | .272\*\* | .044 | .230\*\* | 1 |  |  |  |
| 8. | PPEDSS | .332\*\* | .189\* | .162 | .107 | .368\*\* | .072 | .226\* | 1 |  |  |
| 9. | SPS | .239\*\* | .372\*\* | .429\*\* | .450\*\* | .206\* | .334\*\* | .061 | .164 | 1 |  |
| 10. | SMP | .579\*\* | .759\*\* | .562\*\* | .707\*\* | .413\*\* | .600\*\* | .213\* | .343\*\* | .428\*\* | 1 |

N =600

## \*P<0.05

**\*\*P<0.01**

From Table 13(b) above, it could be observed that all the nine sub-tests of safety management practices correlated positively and in most cases significantly with one

another, meaning that no negative correlation was obtained among the sub-tests, thereby confirming the homogeneity of the scale as a measuring instrument for safety management practices in the organisations. Furthermore, the overall safety management practices test (SMP) positively and significantly correlated with each of the nine sub-tests.

As a result of the above analyses, it is obvious that the sub-tests are in consonance with one another and that the entire safety management practices test is internally consistent with its sub-tests, hence hypothesis (1) which states that there will be positive correlations among the sub-tests of safety management practices and the entire test is confirmed.

### Table 13(c): Summary of Pearson‘s ‗r‘ Inter- Correlation Matrix of Situation Awareness and Safety Management Practices in the Organisations.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MEASURES | 1  ECSIP | 2  EASC | 3  ESP | 4  SAQ | 5  HSAIHC | 6  HSPT | 7  LSM | 8  MAOS | 9  EW | 10  PPEDSS | 11  SPS | 12  MCS | 13  SC | 14  SMPQ |
| 1.ECSIP | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2.EASC | -.056 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |
| 3.ESP | .247\*\* | .293\*\* | 1 |  |  |  |  |  |  |  |  |  |  |  |
| 4.SAQ | .742\*\* | .333\*\* | .567\*\* | 1 |  |  |  |  |  |  |  |  |  |  |
| 5.HSAIHC | .280\*\* | -.024 | .054 | .153 | 1 |  |  |  |  |  |  |  |  |  |
| 6.HSPT | .360\*\* | .059 | .030 | .288\*\* | .568\*\* | 1 |  |  |  |  |  |  |  |  |
| 7.LSM | .232\*\* | .012 | .035 | .110 | .612\*\* | .529\*\* | 1 |  |  |  |  |  |  |  |
| 8.MAOS | .158 | .115 | .079 | .195\* | .268\*\*. | .251\*\* | .279\*\* | 1 |  |  |  |  |  |  |
| 9.EW | .226\*\* | .102 | .255\*\* | .281\*\* | .345\*\* | .256\*\* | .299\*\* | .371\*\* | 1 |  |  |  |  |  |
| 10.PPEDSS | .114 | .187\* | .017 | .131 | .189\* | .162 | .107 | .368\*\* | .332\*\* | 1 |  |  |  |  |
| 11.SPS | .316\*\* | -.100 | -.043 | .164 | .372\*\* | .429\*\* | .450\*\* | .206\* | .239\*\* | .164 | 1 |  |  |  |
| 12.MCS | .274\*\* | .021 | .110 | .192\* | .522\*\* | .400\*\* | .394\*\* | .197\* | .384\*\* | .072 | .334\*\* | 1 |  |  |
| 13.SC | -.016 | .058 | .148 | -.037 | .132 | .006 | .272\*\* | .044 | ..361\*\* | .226\*\* | .061 | .230\*\* | 1 |  |
| 14.SMPQ | .307\*\* | .031 | .100 | .212\* | .759\*\* | .562\*\* | .707\*\* | .413\*\* | .579\*\* | .343\*\* | .428\*\* | .600\*\* | .213\* | 1 |

**N = 600**

**\*\* P < 0.01**

**\* P < 0. 05.**

The correlation matrix showed that most of SA and SMP sub-tests correlated positively, while situation awareness and safety management practices main tests correlated r =0.21\*, hence significant at P< 0. 05, thereby supporting the hypothesis which states that there will be significant positive correlations between situation awareness and safety management practices sub- tests and the entire tests in the organisations. This implies that one can predict the other, since there is positive relationship between the two.

### Hypothesis Two

**2a**. The level of situation awareness and proficiency level of safety management practices in the selected Nigerian organisations will significantly predict commitment of workers in the organisations.

Multiple regression analysis was used for this investigation; the results are shown in Table 14 below.

**Table 14 : Summary of Multiple Regression Analysis showing the independent and joint predictions of the two safety factors (SA & SMP) on Organisational Commitment.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Measure** | **Beta** | **T** | **R** | **R2** | **F** |
| **SA** | **0.07** | **1.90** | **0.45** | **0.20** | **74.83\*** |
| **SMP** | **0.43** | **11.36\*** |

**\*P<0.05 ; df (2/598) ; f -crit (3.00)**

**\*P<0.05 ; t-crit.(1.96)**

The result shows that the two measures (Situation awareness and Safety management practices) accounted for 20% of the variance in Organisational Commitment.

In order to determine if the contribution of the two measures is significant, ANOVA of multiple regressions was computed. The result in Table 14 above shows that the contributions of the predictors to the criterion are statistically significant. The Cal.F-value

= 74.83 > Crit.F-value = 3.00 with df. 2 / 597; significant at P < 0.05 hence, confirming the hypothesis.

Furthermore, in order to determine the relative contribution of each of the predictor variables to the variance of organisational commitment, the beta coefficients and the independent t were computed for the variables. The result in Table 14 shows that SMP contributed significantly to the variance of organisational commitment with 43% as

against 7% for situation awareness. The SMP Cal. t-Value = 11.36\* > Crit. t = 1.96, hence significant at P < 0.05.

On the other hand, SA Cal. t-Value =1.90 < Crit. t –Value =1.96, hence not significant at P

< 0.05.

**2b.** The level of situation awareness and proficiency level of safety management practices in the selected Nigerian organisations will significantly predict job involvement of workers in the organisations.

Multiple regression analysis was used for this investigation; the results are shown in Table 15.

**Table 15: Summary of Multiple Regression Analysis showing the independent and joint predictions of the two safety factors (SA & SMP) on Job Involvement.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Measures** | **Beta** | **T** | **R** | **R2** | **F** |
| **SA** | **0.23** | **5.87\*** | **0.35** | **0.12** | **40.66\*** |
| **SMP** | **0.21** | **5.37\*** |

**\*P<0.05 df (2/598) f -crit (3.00)**

**\*P<0.05 t-crit.(1.96)**

The result shows that the two measures (Situation awareness and Safety management practices) accounted for 12 % of the variance in Job Involvement. In order to determine if the contribution of the two measures is significant, ANOVA of multiple regressions was computed. The result in Table 15 above shows that the contributions of the predictors to the criterion are statistically significant. The Cal.F-value = 40.66 > Crit.F-value = 3.00 with df. 2 / 597; significant at P < 0.05 hence, confirming the hypothesis.

Furthermore, in order to determine the relative contribution of each of the predictor variables to the variance of job involvement, the beta coefficients and the independent t

were computed for the variables. The result in Table 15 above shows that both Situation awareness and Safety management practices contributed significantly to the variance of job involvement at 23% and 21% respectively. Also, the Cal.t-Values of SA and SMP (5.87\* & 5.37\* respectively) are greater than the Crit. t-Value = 1.96, hence both are significant at P < 0.05.

**2c.** The level of situation awareness and proficiency level of safety management practices in the selected Nigerian organisations will significantly predict effective performance of workers in organisations.

Multiple regression analysis was used for this investigation; the results are shown in Table 16 below.

**Table 16: Summary of Multiple Regression Analysis showing the independent and joint predictions of the two safety factors (SA & SMP) on Organisational Effectiveness.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Measures** | **Beta** | **T** | **R** | **R2** | **F** |
| **SA** | **0.07** | **1.90** | **0.12** | **0.01** | **4.25\*** |
| **SMP** | **0.43** | **11.36\*** |

**\*P<0.05 df (2/598) f -crit (3.00)**

**\*P<0.05 t-crit.(1.96)**

The result in Table 16 shows that the two measures (Situation awareness and Safety management practices) accounted for 1 % of the variance in Organisational Effectiveness. To further determine if the contributions of the two measures are statistically significant, ANOVA of multiple regressions was computed. The result in Table 16 shows that the contributions of the predictors to the criterion are statistically significant, hence confirming the hypothesis. The Cal.F-value = 4.25 > Crit.F-value = 3.00 with df. 2 / 597;

significant at P < 0.05. Furthermore, in order to determine the relative contribution of each of the predictor variables (SA & SMP) to the variance of organisational effectiveness, the beta coefficients and the independent t-test were computed for the variables. The result in Table 16 shows that only SMP contributed significantly to the variance in organisational effectiveness, with 43% as against 7% for situation awareness. Also, the Cal. t-Value for SMP = 11.36\* > Crit. t-Value 1.96 and significant at P < 0.05; while the Cal.t-Value for SA = 1.90 < Crit. t-Value = 1.96, hence not significant at P < 0.05.

Generally, hypothesis 2 which states that the level of situation awareness and proficiency level of safety management practices will significantly predict levels of commitment, involvement and effectiveness of workers in the selected work organisations is confirmed.

### Hypothesis Three

The selected employees of the private sector organisations in Nigeria will significantly score higher on situation awareness than those of the public sector organisations.

To test for this hypothesis, an independent t-Test analysis was carried out to determine the significant mean difference between the two organisational types on the measured variable.This is shown in Table 17 .

### Table 17: The Mean, SD and Independent t-Test of Public and Private Sector Organisations Scores on Situation Awareness.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Measure | Org. Type | N | Mean | Std. D | Cal. T | df | P |
| ECSIP | Public  Private | 300  300 | 133.16  139.60 | 20.31  20.56 | -3.86\* | 598 | < 0.05 |
| EASC | Public Private | 300  300 | 55.59  58 .01 | 12.26  39.25 | -1.02 | 598 | NS |
| ESP | Public Private | 300  300 | 63.57  66.33 | 10.35  11.25 | -3.13\* | 598 | < 0.05 |
| SA | Public  Private | 300  300 | 253.23  262.33 | 33.15  47.00 | -2.74\* | 598 | < 0.05 |

\*p < 0.05 ; df (598) ; Crit.t (1.96)

From Table 17 above, it could be observed that the employees from the private sector organisations scored higher than those from the public sector organisations in all the sub- tests of situation awareness and in the entire SA test as follows: ECSIP:139.60 against

133.16; EASC:58.01 against 55.59 ; ESP: 66.33 against 63.57 ; and SA: 262.33 against

253.23 respectively.

From the same Table 17 above, the Independent T-Test analysis showed that the calculated t-values for ECSIP = -3.86 and ESP = -3.13 are greater than their critical t- values of 1.96 respectively, with degree of freedom (df) 598 and each significant at P <

0.05. On the other hand, no significant difference was obtained between both organisational types on EASC sub-test, given that its calculated t-value = - 1.02 is less than the critical t-value = 1.96 with the degree of freedom (df)= 598, hence not significant. Most importantly however, the private sector organisations significantly scored higher than the Public sector organisations on the entire situation awareness test, owing to the fact that the calculated t-value = -2.74 is greater than the critical t-value = 1.96 with 598 as degree of freedom and significant at P < 0.05.

Owing to the fact that the private sector organisations significantly scored higher than the

public sector organisations on the entire situation awareness test, hypothesis 3 which states that the selected Nigerian private sector organisations will significantly score higher than the public sector organisations on situation awareness is confirmed. This by implication means that the private sector employees are more aware of their organisational environment and have better safety awareness than their counterparts in the public sector organisations. However, the general attitudes of the employees in the two organisational types (private and public) to safety consciousness (EASC) did not indicate any significant differences.

### Hypothesis Four

The selected Nigerian private sector organisations will significantly score higher on safety management practices than the public sector organisations.

To test for this hypothesis, an independent T-test analysis was carried out to determine the significant mean difference between the two organisational types on the measured variable.This is seen on Table 18 below.

### Table 18: The Mean, SD and Independent T-test of Public and Private Sector Organisations Scores on Safety Management Practices.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Measure | Org. Type | N | Mean | Std. D | Cal. T | df | P |
| SMP | Public  Private | 300  300 | 226.21  233.57 | 48.44  57.31 | -1.70 | 598 | > 0.05 |

\*p < 0.05 ; df (598) ; Crit.t (1.96)

From Table 18 above, the private sector organisations had higher mean and standard deviation scores on the proficiency level of safety management practices than the public sector organisations (233.57 and 57.31 against 226.21 and 48.44 respectively).

Also, an independent t- Test analysis was carried out to determine the significant

deference between the two organisational types on safety management practices, with the results showing that though the private sector organisations had higher mean and standard deviation scores than the public sector organisations, the mean difference however, is not significant. Given that SMP Cal.-t value = - 1.70 < Crit. –t value =1.96 with df = 598, hence not significant. This by implication means that the two organisational types operate at the same level of safety management practices, thus rejecting the hypothesis.

### Hypothesis Five

Male employees in the selected Nigerian organisations will significantly score higher on situation awareness than their female counterparts.

To test for this hypothesis, an independent T-test analysis was carried out to determine the significant mean difference between male and female participants on the measured variable.This is shown on Table 19 .

### Table 19: The Mean, SD and Independent t-test of Male and Female Scores on Situation awareness in the selected organisations

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Participants‘ Gender** | **N** | **Mean** | **SD** | **Cal. t** | **df** | **P** |
| **Male** | **300** | **260.05** | **46.49** | **1.88** | **598** | **>0.05** |
| **Female** | **300** | **255.51** | **34.32** |
| **Total N =** | **600** |  |  |

\*p < 0.05 ; df (598) ; Crit.t (1.96)

The male employees had higher mean and standard deviation scores (Mean =260.05 & SD

=46.49) than the female employees (Mean =255.51 & SD = 34.32) on situation awareness

in the organisations.

However, the independent t–Test analyses did not indicate any significant mean difference between male and female employees on situation awareness. The analysis showed that the Cal. t- value =1.88 < Crit. t-value = 1. 96 with df = 598; P > 0.05, and given that the sig. level of the calculated t –value 0.24 > 0.05 acceptable standard, hence not significant.

### Hypothesis Six

The middle cadre employees in the selected Nigerian work organisations will significantly score higher on situation awareness than their junior and senior cadres.

To test for this hypothesis, One-way- ANOVA was carried out to determine the significant mean differences among the three organisational cadres on the measured variable.This is shown on Table 20 below.

### Table 20: Summary of One-Way ANOVA to Determine Differences among the three Organisational Cadres on Situation Awareness.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Organisational Cadres** | **Sum of Squares** | **df** | **Mean Squares** | **Cal. F** | **P** |
| Between Groups | 4757.373 | 2 | 2378.687 | 2.291 | > 0.05 |
| Within Groups | 619776.75 | 597 | 1038.152 |
| Total | 624534.12 | 599 |

\*p < 0.05 ; df ( 2 / 598) ; Crit.f (4.61)

Middle cadre employees in the organisations had higher mean and standard deviation scores (Mean = 262. 24; SD =54.01) on situation awareness than the junior cadre (Mean

=252.43; SD =30.07) and the senior cadre (Mean = 258. 67; SD = 34.08).

Notwithstanding that the middle cadre employees seemed to be more safety conscious than other cadres, a one–way analysis of variance revealed that no significant differences between the middle cadre employees and other cadres on situation awareness

The result on Table 20 shows that the middle cadre employees did not significantly score higher than the junior and senior employees on situation awareness. This means that the middle workers in the organisations did not significantly differ from the other organisational cadres on situation awareness.

## CHAPTER FIVE DISCUSSION

This chapter presents the findings of the study and discusses these findings as they achieve the set objectives; justifies these findings with similar results from the exiting literature, while resolving conflicting issues in relationship with previous studies.

### Summary of Findings

The major findings of the study include:

1. The two developed psychological instruments on safety, Situation Awareness Questionnaire (SAQ) and Safety Management Practices Questionnaire (SMPQ) were found to have high reliability coefficients of Cronbach alpha; Guttman Split- half and Spearman- Brown, hence reliable.
2. Both tests were also found to have high and significant concurrent validity coefficients of 0.77 and 0.83 with Offshore Safety test (OSQ), hence valid.
3. While three component factors were extracted from SA test, nine component factors were extracted from SMP test (Tables 2 and 3 respectively).
4. Significant positive correlation was obtained between situation awareness and safety management practices in the organisations. Most of the components of the two safety factors positively and significantly correlated (p < 0.05).
5. Employees‟ level of situation awareness and proficiency level of safety management practices in the selected work organisations positively and significantly predicted organisational commitment, job involvement and the general effectiveness of workers.
6. Employees‟ situation awareness and safety management practices made both joint and independent significant contributions in predicting job involvement, while only safety

management practices made the independent significant contribution in predicting commitment and effectiveness in the selected organisations.

(vii) Employees‟ level of situation awareness in the private sector organisations was found to be significantly higher than that of the public sector organisations, while negative attitude to safety consciousness was found in both organisational types.

(viii). There were no significant differences between the public and private sector organisations in safety management practices.

(ix) There were no significant gender differences in employees‟ situation awareness in the organisations (that is, no gender disparity in levels of situation awareness).

(ix) There were no significant differences in situation awareness among the three organisational cadres.

### Discussion

An evaluation of the exten to which the results of the studies achieved the set objectives of this project is therefore the concern of this segment.

### Evaluation of Item and Factor Analyses

The results of item analyses of newly constructed tests showed that participants rated the positive items higher than the negative items. This is evident in the mean scores of positive items being higher than those of negative items. With this, it was possible to detect ineffective and inconsistent items, hence establishing the discriminatory ability of the tests constructed. Also, items clustered, showed moderate relationships in terms of what they measure. Furthermore, through inter-item correlation using Pearson product moment correlation method, the extent of agreement among item variables was found to be positively high. There were moderate to high positive correlations among positive

items. Negative items mostly clustered differently from the positive items, thereby indicating convergent and divergent reliabilities of the validated tests. For instance, in the situation awareness test, negative items or variables clustered and loaded on the second factor which is employees‟ attitude to safety consciousness (EASC). This particular factor had a negative influence on the entire situation awareness of participants in both standardisation and assessment studies. This has direct implication on the negative attitude of organisational employees towards safety consciousness. Given this, there is a need for sensitization/ intervention strategy for the improvement of workers‟ attitudes towards safety awareness. This negative aspect of safety behaviour in the organisations, also implicates an existing challenge for industrial-organisational psychologists and human resource managers in Nigeria. It is imperative to know that the use of SAQ and SMPQ tests developed in this study provides solution to this challenge.

Factor analysis was carried out during the validation of SAQ, SMPQ and OEQ. The result of principal component analysis (extraction method) of the 62 items of situation awareness test (SAQ) showed that three principal component factors were extracted namely: i. Employees‟ comprehension of safety information and projection (ECSIP); ii. Employees‟ attitude to safety consciousness (EASC); and iii. Employees‟ safety perception (ESP). This result is validated by Endsley (1995) definition and classification of situation awareness into three principal levels.

However, while Endsley classified situation awareness into three independent levels or factors (Perception, Comprehension and Projection), the present study through principal component factoring by Varimax rotation with Kaisaer normalization method, comprehension and projection were merged as factor one (Employees‟ comprehension of

safety information and projection (ECSIP); attitude was identified as a new and second factor -Employees‟ attitude to safety consciousness (EASC) and then Perception as the third factor (Employees‟ safety perception (ESP). The three component factors extracted had eigenvalues ranging from 3.81 to 5.38 and a total of 13.16 eigenvalue. Factor one (ECSIP) had the largest loading of item variables, followed by factor two (EASC), while the least loaded factor was ESP.

In safety management practices (SMP), nine factors were extracted which include: (1) Health and safety audit , inspection and hazard control (HSAIHC); (2) Health and safety policies and training (HSPT); (3) Leadership and safety motivation (LSM) ; (4) Managerial attitude to organisational safety (MAOS); (5) Employees‟ welfare (EW); (6) Provision of protective equipment and development of supervisors‟ skills (PPEDSS); (7) Safety promotion and suiveillance (SPS); (8) Management commitment to safety (MCS); and (9) Safety communication (SC). Their eigenvalues ranged from 1.84 to 6.70 and a total of 28.49 eigenvalues. Factor one (HSAIHC) loaded highest. All the 55 items of the SMP instrument were retained because none loaded less than 0.25 considered to be low weight. The component factors established in this study are validated in Petersen (1993 & 1996) studies in which several authors came up with different numbers such as 8, 9, 12, 17, 20 and 30 basic characteristics/elements of any proficient health and safety management model. These elements were based on perception survey of organisational workers, which effectively identifies strengths and weaknesses of a safety system of the organisation. It equally identifies improvements in, and deterioration of safety system elements if periodically administered. Petersen (2001) concluded that “a better measure of safety programme effectiveness is the response from the entire organisation to questions about the quality of the management systems, which have an effect on human behaviour

relating to safety”. This has the exact implication of what this study aimed to accomplish through survey method, by using the developed instruments to obtain responses from organizational members regarding safety in their work place. Through this way, the strength and weaknesses of safety management in Nigerian organizations , and the effects are ascertained.

Organisational effectiveness was re-validated with Nigerian sample for relevance and suitability for the present study. The seven factors extracted through factor analysis in this study are validated by the original authors of OEQ- Penning (1976) and Shore and Martins (1989), who equally propounded seven component factors. The seven factors include: (1) Career satisfaction (CS), (2) Turnover intention (TOI), (3) Organisational goal (OG), (4) Interpersonal relationship (IPR), (5) Non-Work satisfaction (NWS), (6) Workplace anxiety (WPA), and (7) Morale (M). The seven factors had eigenvalues ranging from 1.65 to 2.44 and a total of 14.14 eigenvalues.

### Evaluation of Reliability and Validity Analyses

Reliability analyses were carried out for the three tests and the results obtained showed high reliability coefficients for Guttman Split-half (odd and even), Spearman-Brown and Cronbach Alpha methods. However, separate reliabilities were achieved for the sub-tests using Cronbach Alpha method only and results yielded high reliability coefficients, which goes a long way in confirming the internal consistency and homogeneity of each of the tests. The high reliability coefficients obtained for the newly developed tests are in conformity with the view of Aiken (2003), who affirmed that the acceptability coefficients of a new test must not be less than 0.70. Therefore, given that the reliability coefficients obtained in this study were as high as 0.70 and above confirms the reliability of the SAQ and SMPQ instruments.

In validity analyses of the three instruments (SAQ, SMPQ and OEQ), the first evidence for validity of the tests was their ability to perform according to theoretical expectation during the standardization study, hence construct validity. The positive items of the tests were rated higher than the negative items; hence the positive items had higher mean scores than the negative items as stated earlier on. Also, the clustering of items according to homogeneity was an expected trend in the validation study, indicating the appropriateness and suitability of the test for measuring safety in organisations.

Furthermore, the offshore safety questionnaire (OSQ) developed by Rundmo (1994) was considered appropriate for the validation of situation awareness and safety management practices tests, considering the fact that the three instruments similarly measure safety variables, though at different levels and domains. Therefore, correlating SAQ and SMPQ with OSQ and their sub-tests, high concurrent validity coefficients were obtained, significant at p < 0.05 level. As a result of the high validity coefficient results obtained, the two tests (SAQ & SMPQ) and their sub-tests are considered as good measuring instruments for safety management in organisations. Besides, the choice of offshore safety test (OSQ) for validation of SAQ and SMPQ is appropriate because of the compatibility of its variables with the validated tests in measuring safety in hazard-prone organisations. Also, the offshore safety test is widely used in measuring safety in offshore oil and gas installations in Europe, hence well suited for validating SAQ and SMPQ in the present study.

**Hypothesis 1** which states that there will be significant positive correlations between situation awareness and safety management practices sub-tests and the entire tests in the selected Nigerian work organisations was also confirmed. The second hypothesis was to

determine the correlation or relationship between situation awareness and safety management practices in accident-prone Nigerian organisations.

The result showed that the sub-tests of situation awareness test positively correlated with one another; and also, each sub-test correlated significantly positive with the entire SA test, thereby confirming the internal consistency and homogeneity of the test. It implies that SA test is a reliable instrument for measuring situation awareness and safety consciousness of organisational workers. In the same vein, the nine sub-tests of safety management practices test (SMPQ) positively correlated with one another; and each sub-test significantly correlated with the entire SMP test, also confirming the homogeneity, reliability and consistency of the scale as a good measuring instrument for safety management practices in the organisations. The Pearson product moment correlation used for this analysis revealed significant level of p < 0.05 . Given that both SA and SMP tests were each homogeneous, internally consistent and that their sub-tests were in agreement with one another; and can also predict one another, the hypothesis which states that there will be significant positive correlation between situation awareness and safety management practices in the selected Nigerian organisations was confirmed.

In another development, the relationship between the two safety factors (situation awareness and safety management practices), which tests were standardised in this study, was statistically established by testing for hypothesis of correlation using the Pearson Product Moment correlation method. The result showed that situation awareness and safety management practices positively and significantly correlated r = 0.21\*, sig. at P < 0.05. Also, that about 90% of the sub-scales of the two tests correlated positively showed homogeneity and the predictive capacity of measuring safety in hazard-prone organisations.

It further established reliability and agreement between two tests and among their sub- scales.

**Hypothesis 2a, b & c** which states that the level of situation awareness and proficiency level of safety management practices in the selected Nigerian organisations will significantly predict effective performance (commitment, involvement and organisational effectiveness) of workers in the organisations was confirmed. The result of multiple regression analysis revealed that the two independent variables (SA and SMP) significantly predicted organisational commitment, job involvement and organisational effectiveness, thereby confirming the hypotheses. However, discriminant analysis was applied to determine the rate of contribution made by each predictor variable to the total prediction made on each dependent variable. The results of discriminant analyses showed that both SA and SMP collectively and separately made significant positive contributions in predicting job involvement (JI).

On the other hand, while SA only contributed positively in predicting organisational commitment (OC) and organisational effectiveness (OE), SMP made significant positive contribution in predicting both variables.

Generally, these results are in agreement with O‟Dean and Flin (2003), who stated that “the general organisational climate and safety climate are shown to exert a strong impact on an individual‟s motivation to achieve work outcomes, and provide a context in which specific evaluations of the importance of safety are made”. They also discovered from their study that management commitment to safety emerged as a key construct and has strong relationship with employees‟ outcomes. Mogaji (1998) regressed 27 organisational climate variables and the result showed that 5 variables each predicted employees‟ job involvement

at P < 0.01, while 8 variables predicted job commitment of employees‟ at P < 0.01. In their analysis of the top five performing companies, Cohen and Cleveland (1983) stated that all of the top performing companies had certain characteristics in common namely: (1) that safety was a real priority in corporate policy and action; and (2) Safety practices and procedures were considered to be intrinsic to ongoing production goals. Similarly, Diaz and Cabrera (1997) found that employees‟ perception of the organisation‟s philosophy of production is the second most important factor in predicting safety performance. This confirms positive relationship between safety and productivity.

Furthermore, Gaerthner et al (1987) found that companies that had better safety records also tend to be more productive. In another study, Smard & Marchand (1994 & 1995) identified a link between managers‟ participative involvement in the organisation with employees and improved safety outcomes. Niehoff, Enz and Crover (1990) and Zeffane (1994) found that commitment to organisation significantly predicted workers‟ safety initiatives, and participative involvement predicted workers‟ safety rule compliance.

Mogaji (1997) described organisational climate as “the perceived characteristic of the work environment, which embodies characteristics such as structure, responsibility, reward, risk, support, warmth, standard, conflict, and identity in the organisation”. In his study, result showed positive relationship among organisational climate variables, job involvement and organisational commitment. Given that situation awareness and safety management practices are aspects of organisational climate, which have exhibited positive relationship with organisational commitment, job involvement, and effectiveness, this study is therefore validated by the results obtained by Mogaji.

**Hypothesis 3** states that the selected employees of the private sector organisations in

Nigeria will significantly score higher on situation awareness than those of the public sector organisations. Also, an investigation was carried out to determine wether the employees of the selected private sector organisations will significantly score higher on situation awareness than their counterparts in the public sector organisations. Statistical analysis showed that the private sector organisations had greater mean scores in all the sub-tests of situation awareness and on the entire situation awareness than the public sector organisations. This implies that the employees in private sector organisations are more safety conscious and more aware of their organisational setting in terms of safety than the public sector organisations, thus confirming the hypothesis.

Furthermore, application of T-test of independent mean showed that there is significant mean difference between the two organisational types on situation awareness and thus, confirming the hypothesis. Also, its two component factors (Employees‟ comprehension of safety information and projection (ECSIP) and Employees‟ safety perception (ESP) showed significant mean difference. In practical terms, results showed that the employees/workers in private organisations have better awareness of their organisational environment than their counterparts in the public sector organisations. Also, that the employees‟ of the private organisations perceive, comprehend and project better than their counterparts in the public organisations on safety information. This can be attributed to the nature of job being performed by the private sector employees such as manufacturing, construction etc., which involves use of heavy duty machines and equipment that require more safety precautions to avoid accidents than most workers in the public sector organisations.

However, the two organisational types did not show any significant mean difference on employees‟ attitude to safety consciousness (EASC). This means that the employees of the two organisational types had the same attitude to safety consciousness.

**Hypothesis 4** which states that the selected Nigerian private sector organisations will significantly score higher on safety management practices than the public sector organisations was rejected.

Further to the concern of this study, an important investigation was carried out to determine the significant mean difference between organisational types (public and private) on safety management practices. The results showed no significant mean difference. This implies that both the public and private sector organisations adopt or apply similar safety management practices. This result is validated by Thomopulus (1981), Amaechi (1990) and Eze (2004a). In their various analyses of organisational safety management practices in Nigeria, they saw managements from the same perspective of not caring for the safety and well being of their employees irrespective of public or private organisations. They believed that organisational managers in Nigeria see profit maximisation as the ultimate concern, while health and safety of workers in their organisations are totally neglected. They went further to attribute this to why accidents consistently occur in our work organisations. Eze (2004b) among other things, also attributed this as one of the reasons for ineffectiveness in indigenous organisations in Africa.

However, training has been identified by researchers as a crucial factor of improving some inadequacies in humans, so as to improve performace and productivity in any given field or task of organisation. Abdul Aziz and Ahmad (2011) noted that training aims at providing current and new employees with the basic skills and behaviour they require to perform their

tasks effectively, while Koch and McGrath (1996) revealed that training programmes increase productivity and reduce turnover. Bandar and Al-Qatawneh (2012) discovered that the training programmes conducted at the workplace enhanced the performance of the participants, their job involvement and increased job tenure. Makanju (1985) discovered that level of formal education significantly affected the ability to interpret pictures in three dimensions and that training effect on performance was significantly greater for upper socio- economic school (USS) children than lower socio-economic children. Saba (1987) discovered that training was generally effective irrespective of the method applied. Also, Saba (1996) in another study, discovered that training facilitated the understanding of the four physical concepts (water displacement, object floating, gravitational force and mechanical movement) of primaries I to IV school children.

Stokids et al (2001) looked at the effectiveness of a managerial training programme to enhance corporate compliance with worksite health and safety regulations in forty - eight small and medium-sized companies in the USA, which were compared with forty-six control companies that did not receive the training. The training programme offered participants information about regulatory requirements and emphasized organisational and environmental strategies for reducing occupational injuries, illness or hazards. It was found that participation in the training programme was associated with higher levels of corporate regulatory compliance twelve months after the training. Moreover, the effects were mediated by post- training changes in managers‟ knowledge of regulatory requirements. The findings highlight two important issues: (1) managerial training programmes can be effective in improving workplace health and safety performance and (2) managers‟ knowledge of regulatory requirements is an important determinant of safety performance.

In the present study, safety training programme was adopted in the PSM model as one of the intervention strategies (ISx) of enhancing employees‟ situation awareness/safety consciousness in the organisation. Also, safety training being a component factor of safety management practices test, if implemented; the negative attitude of employees towards safety awareness in the organisations would change positively. Futhermore, this study adopted reward system as the second intervention strategy (ISy), which the organisational management must apply to achieve both proficient safety management practices and employees‟ positive attitudes to good safety behaviour.

**Hypothesis 5** which states that, male employees in the selected Nigerian organisations will significantly score higher on situation awareness than their female counterparts was also rejected. The results of the analysis revealed that male employees had higher mean and standard deviation scores (Mean =260.05 & SD =46.49) than the female employees (Mean

=255.51 & SD = 34.32) on situation awareness in the organisations.

However, the independent T– test analyses did not indicate any significant mean difference between male and female employees on situation awareness, hence the Cal. T- value =1.88

< Crit. T-value = 1. 96 with df = 598; and P > 0.05. This result brings to bear Maslow‟s theory of human needs (1949), in which safety was classified as second most essential need of every individual in the hierarchy. This implies that every individual desire safety for life, hence the desirability rate may be difficult to determine between genders.

**Hypothesis 6** states that the middle cadre employees in the selected Nigerian work organisations will significantly score higher on situation awareness than their junior and senior cadres. Middle cadre employees in the organisations had higher mean and standard

deviation scores (Mean = 262. 24; SD =54.01) on situation awareness than the junior cadre (Mean =252.43; SD =30.07) and the senior cadre (Mean = 258. 67; SD = 34.08).

Notwithstanding that the middle cadre employees seemed to be more safety conscious than other cadres, a one–way analysis of variance revealed that no significant mean differences between the middle cadre employees and other cadres on situation awareness. This hypothesis was equally rejected as occupational cadre has no differential effects on the situation awareness of the employees. This result is also validated by Maslow‟s hierarchy theory of human needs as stated above.

## CHAPTER SIX CONCLUSION AND RECOMMENDATIONS

This chapter draws conclusions from the results of the study, states the implications and limitations of the study, makes recommendations to stakeholders, enumerating the basic contributions to knowledge and finally, putting forward suggestions for future research.

### Conclusions

Based on the above findings of this study, the following conclusions are drawn:

1. Situation awareness test (SAQ) and Safety management test SMPQ) are reliable and valid psychological instruments that can be used to measure situation awareness and safety management practices in accident-prone organisations.
2. Safety factors of situation awareness and safety management practices can effectively and significantly predict organisational commitment, job involvement and organisational effectiveness. The higher the proficiency level of SMP and SA in the organisations, the more committed, involved and effective the employees of the organisations.
3. Private sector employees are more aware of their organisational environment than their public sector counterparts.
4. Safety is an essential need to every individual, hence no disparity between gender and organisational cadres on situation awareness.
5. There are general poor safety management practices in the Nigerian organisations, irrespective of public or private sector.
6. Workplace anxiety had negative correlation with both organisational effectiveness and safety factors in the study, hence it has the potential to cause accidents/ hazards in the organisations.
7. Employees‟ welfare was found to be positively and significantly correlated with

twenty- two out of the twenty-four measures in this study; hence, indicating the importance of adquate welfare for organisational workers.

### Implications of the Findings

The findings from this study are useful in understanding the nature of safety management practices and employees‟ situation awareness in Nigerian organisations. These two safety factors are positively related and causal factors of industrial/organisational accidents, which must be effectively managed by organisational experts to ensure effective job performance in the organisation.

Employees‟ attitude to safety consciousness was identified as the most prevalent level of situation awareness error in which accidents occur in the organisations. This would help organisational managers to direct their limited resources to attitudinal change of their employees to safety consciousness in accident prevention. Safety training programmes and other motivational measures (Example reward for good safe working behaviour) would be found relevant in this regard as intervention strategies in the extinction of negative attitudes to safety in organisations.

Furthermore, this study showed that safety need is a basic necessity of every individual and therefore, neither gender nor cadre had influence on employees‟ situation awareness. However, it was established that situation awareness varied with organisational type as scores of employees in the private sector organisations are significantly higher than those of the public sector organisations.

In addition, the two psychological instruments developed in this study are useful for proficient safety management in the selected organisations. The Situation awareness test in

particular can be used by the human resources managers to detect applicants that are accident-prone during recruitment, while already employed accident-prone workers can improve by the application of intervention strategy of safety training programmes and rewards for safe working behaviour.

Finally, the findings indicated that work place anxiety which is a component factor of organisational effectiveness correlated negatively to almost all the safety components in the study. This must be avoided by organisational managers, since pressure and anxiety are counter productive, and can cause accidents in the organisations.

### Limitations of the Study

In spite of the valuable implications of this study, the optimal level of employees‟ situation awareness needed to determine the excessive safety consciousness that can cause accident and general ineffectiveness in organisations was not established in this study. Future researches therefore, could address this challenge to determine the limit to safety consciousness in Nigerian organisations, so as to avoid its counter effects on productivity and general effectiveness.

Also, there should be caution on the generalisation of the findings since the instruments were developed and used in Nigeria. This is because; attitudes to safety consciousness on both individual and organisational levels vary across the globe. Therefore, what is the probability that the same results obtained in Nigeria with the instruments, will also be obtained in other African countries, and in comparison with Europe and other parts of the world. This can only be verified when the developed safety instruments are tested across the continents.

### Recommendations

1. Organisational managements in Nigeria should adopt the use of SAQ and SMPQ instruments in solving the problems associated with safety management practices in their organisations. While situation awareness is used to identify the levels of errors of accident occurrence in the organisations and employees‟ weakness in operating safely in the organisations, safety management practices test (SMPQ) would help the management to know what to do and how to do them rightly to ensure proficiency in safety management in their organisations.
2. It is also recommended that organisational managers in both public and private sector organisations should make proficient safety management practices a thing of priority by involving employees, and effectively encouraging and emphasising on the application of the crucial factors of safety management practices and situation awareness as identified in this study.
3. The sources, causes and types of workplace anxiety must be effectively identified and avoided by organisational managers with a view to controlling their influences on organisational safety. Chief Executives should avoid policies and regulations that induce anxiety in their workers, such as setting targets within short time frame, mounting pressure that leads to short cuts in achieving goals , and so on.
4. The organisational managers and industrial psychologists should ensure that SAQ test is one of the instruments used for objective personnel selection in the recruitment of new employees, so as to ensure that people with high quality of situation awareness among other requirements are selected and placed appropriately in jobs. This would help in reducing the chances of employing the accident-prone applicants, while such applicants already

employed would be identified for effective retraining and placement where the risk of accident is minimal.

### Contributions to Knowledge

This study has contributed to knowledge in the following ways:

1. In the course of this study, two valid and reliable psychological safety instruments (safety management practices and Situation awareness tests) were developed for measuring safety in accident-prone Nigerian organisations.
2. The study established that situation awareness and safety management practices can significantly predict employees‟ commitment, involvement and general effectiveness in the selected Nigerian work organisations.
3. The study also established that significant positive correlation exits between situation awareness and safety management practices in the selected Nigerian organisations.
4. This study also developed a proficient safety management model (PSMM), which demonstrates the inter-relationships among safety factors, organisational variables and their predicted outcomes. This model is new, since no study to the best knowledge of the investigator bears this model.
5. The study established the fact that private sector employees in the selected Nigerian organisations have significantly higher awareness of their work environment than the public sector employees.

### Suggestion for further Research

**(a)**. There is a great challenge in future research to further identify types, sources and causes of workplace anxiety in Nigerian organisations and devising effective measures of control,

which will invariably reduce organisational accidents and improve general effectiveness in work organisations.

1. Another important concern for future research is on the problem of plane crashes in Nigeria. The relevance of BASI (1996) study in which the concept of INDICATE programme was applied in improving airline safety management using the data from an Australian regional airline cannot be overemphasised. This study could be replicated in the Nigerian aviation industry using a test battery comprising the BASI- INDICATE programme, SAQ and SMPQ tests to generate indigenous data from the local airlines in Nigeria, so as to provide a holistic approach in reducing the rate of air disasters, which seem to erode the sense of safety in the Nigerian air transport system.

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## APPENDICES:

**APPENDIX A: STANDARDIZATION STUDY ITEM ANALYSIS**

**Participants‘ Mean and Standard Deviation Scores on SAQ, SMPQ & OEQ Item Variables**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ITEM** | **SAQ VARIABLES** | | **SMPQ VARIABLES** | | **OEQ VARIABLES** | |
| **S/N** | **\_ X** | **SD** | **\_ X** | **SD** | **\_ X** | **SD** |
| **VR1** | **5.22** | **1.89** | **4.70** | **2.03** | **4.22** | **.99** |
| **VR2** | **3.91** | **2.25** | **4.73** | **1.93** | **4.05** | **1.03** |
| **VR3** | **5.51** | **1.82** | **4.33** | **2.00** | **3.72** | **1.28** |
| **VR4** | **3.45** | **2.34** | **4.38** | **2.27** | **3.36** | **1.31** |
| **VR5** | **5.28** | **1.97** | **3.54** | **2.10** | **3.61** | **1.28** |
| **VR6** | **4.24** | **2.98** | **4.15** | **2.01** | **3.42** | **1.31** |
| **VR7** | **3.05** | **2.02** | **4.38** | **2.11** | **3.58** | **1.24** |
| **VR8** | **5.25** | **2.11** | **4.65** | **2.05** | **4.14** | **1.08** |
| **VR9** | **3.78** | **2.16** | **4.25** | **2.05** | **3.80** | **1.28** |
| **VR10** | **5.39** | **1.80** | **3.62** | **2.08** | **3.99** | **1.31** |
| **VR11** | **4.92** | **2.12** | **4.23** | **1.96** | **4.03** | **1.16** |
| **VR12** | **4.30** | **2.27** | **4.37** | **2.08** | **3.02** | **1.29** |
| **VR13** | **3.48** | **1.96** | **4.03** | **1.96** | **2.80** | **1.24** |
| **VR14** | **4.03** | **2.11** | **3.79** | **2.08** | **2.55** | **1.41** |
| **VR15** | **4.98** | **1.99** | **3.16** | **1.99** | **3.25** | **1.43** |
| **VR16** | **4.99** | **2.27** | **3.33** | **1.87** | **2.70** | **1.23** |
| **VR17** | **5.57** | **1.79** | **4.13** | **1.82** | **2.48** | **1.28** |
| **VR18** | **5.23** | **1.95** | **4.27** | **1.99** | **2.92** | **1.08** |
| **VR19** | **5.31** | **1.96** | **4.22** | **2.02** | **2.99** | **1.43** |
| **VR20** | **4.97** | **2.22** | **3.95** | **2.01** | **3.35** | **1.17** |
| **VR21** | **5.56** | **1.56** | **3.15** | **1.94** | **3.42** | **1.16** |
| **VR22** | **5.59** | **1.53** | **4.08** | **1.91** |  |  |
| **VR23** | **5.53** | **1.89** | **4.01** | **1.84** | **21 ITEMS** |  |
| **VR24** | **5.44** | **1.85** | **4.53** | **1.99** |  |  |
| **VR25** | **5.07** | **1.82** | **4.72** | **1.95** |  |  |
| **VR26** | **4.47** | **2.16** | **3.92** | **1.91** |  |  |
| **VR27** | **3.69** | **2.11** | **3.68** | **2.02** |  |  |
| **VR28** | **5.18** | **2.09** | **3.68** | **2.02** |  |  |
| **VR29** | **5.03** | **1.94** | **3.48** | **2.07** |  |  |
| **VR30** | **5.45** | **1.66** | **3.59** | **1.82** |  |  |
| **VR31** | **3.22** | **1.98** | **4.10** | **1.83** |  |  |
| **VR32** | **5.01** | **1.84** | **3.98** | **2.00** |  |  |
| **VR33** | **3.87** | **2.05** | **4.22** | **1.92** |  |  |
| **VR34** | **5.59** | **1.86** | **3.27** | **1.95** |  |  |
| **VR35** | **5.39** | **1.53** | **3.22** | **1.99** |  |  |
| **VR36** | **5.69** | **1.71** | **3.66** | **2.05** |  |  |
| **VR37** | **3.99** | **2.02** | **2.82** | **1.84** |  |  |
| **VR38** | **4.91** | **1.78** | **2.63** | **1.93** |  |  |
| **VR39** | **5.42** | **1.64** | **2.66** | **1.83** |  |  |
| **V40** | **4.93** | **1.96** | **3.04** | **1.80** |  |  |
| **VR41** | **4.89** | **1.74** | **3.80** | **1.87** |  |  |
| **VR42** | **3.73** | **2.02** | **3.64** | **1.95** |  |  |
| **VR43** | **3.77** | **2.17** | **4.12** | **1.89** |  |  |
| **VR44** | **3.89** | **2.14** | **4.04** | **2.07** |  |  |
| **VR45** | **4.89** | **1.74** | **3.62** | **2.04** |  |  |
| **VR46** | **4.73** | **1.90** | **3.65** | **1.82** |  |  |
| **VR47** | **5.13** | **1.69** | **3.48** | **1.96** |  |  |
| **VR48** | **5.24** | **1.83** | **3.60** | **1.82** |  |  |
| **VR49** | **4.62** | **1.64** | **3.95** | **1.89** |  |  |
| **VR50** | **5.12** | **1.79** | **3.48** | **1.94** |  |  |
| **VR51** | **5.18** | **1.82** | **4.57** | **1.85** |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **VR52** | **3.90** | **1.75** | **4.37** | **1.80** |  |  |
| **VR53** | **5.86** | **1.61** | **4.13** | **1.85** |
| **VR54** | **3.37** | **2.18** | **3.43** | **1.82** |
| **VR55** | **3.75** | **1.90** | **3.75** | **1.97** |
| **VR56** | **4.94** | **1.94** |  |  |
| **VR57** | **2.56** | **1.46** | **55 ITEMS** |  |
| **VR58** | **5.18** | **1.74** |  |  |
| **VR59** | **4.74** | **1.80** |  |  |
| **VR60** | **4.48** | **1.98** |  |  |
| **VR61** | **4.61** | **1.89** |  |  |
| **VR62** | **2.98** | **1.73** |  |  |
| **62 ITEMS** |  |  |  |  |

## N=130

**APPENDIX B: PRINCIPAL COMPONENT FACTORING OF (SAQ) VARIABLES: VARIMAX ROTATION WITH KAISER NORMALIZATION.**

|  |  |  |  |
| --- | --- | --- | --- |
| **VARIABLES** | **1** | **2** | **3** |
| V1 | 0.569 | 0.005 | 0.163 |
| V10 | 0.297 | 0.171 | -0.242 |
| V11 | 0.274 | 0.005 | -0.002 |
| V12 | 0.301 | -0.004 | 0.000 |
| V13 | 0.009 | 0.278 | 0.229 |
| V14 | 0.102 | -0.352 | 0.208 |
| V15 | 0.006 | 0.372 | -0.003 |
| V16 | 0.152 | 0.437 | -0.376 |
| V17 | 0.200 | 0.111 | -0.553 |
| V18 | 0.352 | 0.206 | -0.460 |
| V19 | 0.324 | 0.389 | -0.009 |
| V2 | -0.360 | 0.336 | 0.000 |
| V20 | 0.209 | 0.451 | -0.253 |
| V21 | 0.317 | 0.000 | 0.133 |
| V22 | 0.549 | 0.009 | -0.005 |
| V23 | 0.269 | -0.168 | -0.135 |
| V24 | 0.624 | 0.166 | -0.009 |
| V25 | 0.446 | 0.133 | 0.378 |
| V26 | 0.355 | 0.132 | 0.469 |
| V27 | -0.283 | 0.220 | -0.454 |
| V28 | 0.180 | 0.212 | 0.294 |
| V29 | 0.338 | -0.105 | 0.275 |
| V3 | 0.406 | 0.009 | 0.139 |
| V30 | 0.486 | 0.004 | -0.003 |
| V31 | -0.189 | 0.290 | 0.379 |
| V32 | 0.008 | 0.426 | 0.002 |
| V33 | 0.297 | 0.193 | 0.111 |
| V34 | 0.301 | 0.212 | 0.004 |
| V35 | 0.336 | -0.007 | 0.465 |
| V36 | 0.488 | 0.01 | -0.164 |
| V37 | 0.162 | -0.006 | 0.119 |
| V38 | 0.006 | 0.294 | 0.234 |
| V39 | 0.270 | -0.00 | -0.302 |
| V4 | 0.004 | 0.221 | -0.117 |
| V40 | 0.006 | 0.458 | 0.003 |
| V41 | 0.386 | -0.178 | -0.110 |
| V42 | -0.009 | 0.396 | 0.300 |
| V43 | -0.006 | 0.384 | 0.001 |
| V44 | -0.209 | 0.407 | 0.128 |
| V45 | 0.264 | 0.007 | 0.195 |
| V46 | -0.003 | 0.412 | -0.000 |
| V47 | 0.333 | -0.277 | -0.149 |
| V48 | 0.623 | -0.001 | -0.009 |
| V49 | 0.451 | -0.167 | -0.006 |
| V5 | 0.450 | -0.000 | 0.198 |
| V50 | 0.391 | -0.146 | -0.008 |
| V51 | -0.004 | 0.502 | 0.144 |
| V52 | 0.374 | -0.303 | -0.255 |
| V53 | 0.254 | 0.124 | -0.249 |
| V54 | 0.002 | 0.469 | -0.210 |
| V55 | 0.129 | 0.246 | -0.261 |
| V56 | 0.503 | -0.416 | -0.009 |
| V57 | -0.009 | 0.297 | -0.001 |
| V58 | 0.468 | -0.109 | 0.007 |
| V59 | 0.396 | -0.005 | -0.003 |
| V6 | 0.199 | 0.173 | 0.256 |
| V60 | -0.005 | 0.408 | 0.101 |
| V61 | 0.359 | -0.140 | 0.133 |
| V62 | -0.008 | 0.008 | -0.180 |
| V7 | -0.130 | -0.166 | 0.006 |
| V8 | 0.345 | 0.377 | -0.008 |
| V9 | 0.001 | 0.128 | 0.150 |

**The first 3 Eigen values: 5.383, 3.971**

## APPENDIX C: PRINCIPAL COMPONENT FACTORING OF SAFETY MANAGEMENT PRACTICES (SMPQ-VARIABLES): VARIMAX ROTATION WITH KAISER NORMALIZATION.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VAR** |  |  |  |  | **FACTORS** |  | | | | |
|  | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |  |
| **V1** | **0.588** | **-0.006** | **0.108** | **-0.002** | **0.277** | **0.342** | **-0.107** | **-0.008** | **-0.004** |  |
| **V10Z** | **0.376** | **0.205** | **0.423** | **-0.002** | **0.003** | **0.006** | **-0.249** | **-0.005** | **-0.008** |  |
| **V11** | **0.508** | **-0.318** | **0.138** | **0.003** | **0.006** | **-0.150** | **0.131** | **-0.003** | **0.361** |  |
| **V12** | **0.495** | **-0.418** | **-0.006** | **0.228** | **0.178** | **-0.193** | **0.155** | **-0.002** | **0.009** |  |
| **V13** | **0.410** | **0.001** | **-0.243** | **0.005** | **-0.126** | **0.008** | **-0.282** | **-0.298** | **-0.265** |  |
| **V14** | **0.468** | **0.232** | **0.369** | **0.123** | **0.255** | **-0.008** | **-0.001** | **0.002** | **-0.009** |  |
| **V15** | **0.521** | **-0.001** | **0.127** | **0.167** | **-0.002** | **0.249** | **-0.198** | **-0.381** | **-0.008** |  |
| **V16** | **0.532** | **0.328** | **-0.211** | **0.374** | **-0.128** | **-0.495** | **0.004** | **-0.125** | **-0.006** |  |
| **V17** | **0.216** | **0.295** | **0.009** | **0.304** | **0.296** | **0.004** | **-0.169** | **0.225** | **0.152** |  |
| **V18** | **0.171** | **0.006** | **-0.201** | **0.322** | **-0.002** | **0.151** | **-0.006** | **-0.005** | **0.495** |  |
| **V19** | **-0.000** | **0.207** | **-0.006** | **0.406** | **0.244** | **-0.004** | **0.225** | **0.001** | **-0.004** |  |
| **V2** | **0.676** | **-0.199** | **0.241** | **0.001** | **0.277** | **0.220** | **0.004** | **-0.100** | **-0.004** |  |
| **V20** | **0.340** | **-0.105** | **-0.008** | **0.240** | **-0.002** | **0.169** | **-0.265** | **0.000** | **-0.007** |  |
| **V21** | **0.428** | **0.008** | **0.165** | **0.280** | **-0.312** | **-0.181** | **0.000** | **0.202** | **-0.278** |  |
| **V22** | **0.121** | **0.209** | **0.206** | **-0.008** | **0.264** | **0.003** | **0.112** | **-0.304** | **0.425** |  |
| **V23** | **0.354** | **-0.180** | **-0.190** | **0.344** | **-0.306** | **-0.121** | **-0.000** | **0.147** | **0.161** |  |
| **V24** | **0.358** | **0.001** | **-0.218** | **0.299** | **-0.177** | **0.153** | **-0.005** | **0.268** | **0.008** |  |
| **V25** | **0.401** | **0.110** | **-0.004** | **-0.155** | **0.301** | **-0.007** | **-0.366** | **0.379** | **0.105** |  |
| **V26** | **0.721** | **-0.258** | **-0.004** | **-0.188** | **0.001** | **0.007** | **0.000** | **0.115** | **0.006** |  |
| **V27** | **0.694** | **-0.006** | **-0.132** | **-0.270** | **0.190** | **0.113** | **-0.121** | **0.165** | **0.006** |  |
| **V28** | **0.452** | **0.192** | **-0.451** | **-0.117** | **-0.002** | **0.108** | **-0.139** | **-0.007** | **0.008** |  |
| **V29** | **0.288** | **0.405** | **0.233** | **-0.007** | **0.216** | **-0.297** | **0.302** | **-0.005** | **0.008** |  |
| **V3** | **0.285** | **0.001** | **0.412** | **0.277** | **-0.148** | **-0.109** | **-0.218** | **0.150** | **0.006** |  |
| **V30** | **0.261** | **0.316** | **0.295** | **-0.167** | **-0.152** | **-0.167** | **-0.141** | **-0.005** | **0.001** |  |
| **V31** | **0.521** | **-0.140** | **0.103** | **0.004** | **-0.007** | **-0.123** | **0.157** | **0.295** | **-0.003** |  |
| **V32** | **0.447** | **-0.204** | **0.196** | **-0.107** | **-0.128** | **0.004** | **0.311** | **0.006** | **-0.007** |  |
| **V33** | **0.356** | **0.007** | **-0.289** | **-0.189** | **0.408** | **-0.135** | **0.156** | **0.216** | **-0.305** |  |
| **V34** | **0.145** | **0.415** | **-0.278** | **0.002** | **0.303** | **-0.247** | **0.004** | **-0.004** | **0.188** |  |
| **V35** | **0.341** | **0.006** | **0.186** | **-0.002** | **-0.004** | **-0.359** | **0.000** | **-0.227** | **0.214** |  |
| **V36** | **0.417** | **-0.122** | **-0.110** | **-0.294** | **0.209** | **0.111** | **-0.345** | **0.008** | **0.113** |  |
| **V37** | **0.235** | **0.472** | **-0.006** | **0.106** | **-0.003** | **0.251** | **0.009** | **-0.370** | **0.321** |  |
| **V38** | **0.158** | **0.547** | **-0.224** | **-0.007** | **-0.332** | **0.202** | **0.003** | **-0.003** | **0.211** |  |
| **V39** | **0.228** | **0.300** | **0.273** | **-0.443** | **-0.306** | **0.146** | **-0.245** | **0.113** | **-0.312** |  |
| **V4** | **0.305** | **0.337** | **0.000** | **0.154** | **0.396** | **-0.211** | **0.003** | **0.009** | **-0.221** |  |
| **V40** | **0.521** | **0.216** | **0.008** | **-0.009** | **0.378** | **-0.122** | **-0.172** | **0.290** | **0.322** |  |
| **V41** | **0.617** | **0.105** | **-0.239** | **-0.009** | **-0.173** | **-0.255** | **-0.009** | **-0.009** | **-0.002** |  |
| **V42** | **0.705** | **-0.009** | **0.000** | **-0.206** | **0.007** | **-0.002** | **-0.000** | **-0.001** | **0.008** |  |
| **V43** | **0.596** | **-0.007** | **-0.417** | **0.128** | **-0.004** | **-0.233** | **-0.004** | **-0.000** | **-0.001** |  |
| **V44** | **0.228** | **0.252** | **-0.005** | **-0.009** | **0.170** | **-0.191** | **-0.009** | **-0.009** | **-0.006** |  |
| **V45** | **0.434** | **0.311** | **0.124** | **-0.129** | **-0.141** | **-0.241** | **-0.177** | **-0.329** | **-0.150** |  |
| **V46** | **0.547** | **-0.001** | **-0.181** | **-0.292** | **-0.112** | **0.107** | **0.251** | **-0.241** | **0.162** |  |
| **V47** | **0.632** | **0.008** | **0.111** | **-0.131** | **-0.005** | **-0.002** | **0.374** | **-0.004** | **-0.150** |  |
| **V48** | **0.707** | **-0.009** | **-0.209** | **-0.176** | **-0.003** | **0.148** | **0.232** | **0.005** | **-0.005** |  |
| **V49** | **0.569** | **-0.157** | **-0.211** | **-0.007** | **-0.001** | **0.169** | **0.256** | **0.131** | **0.006** |  |
| **V5** | **0.392** | **-0.001** | **-0.009** | **-0.002** | **-0.113** | **0.187** | **0.773** | **0.003** | **0.006** |  |
| **V50** | **0.299** | **0.357** | **0.272** | **-0.005** | **-0.005** | **0.401** | **0.316** | **0.230** | **-0.005** |  |
| **V51** | **0.622** | **0.167** | **0.004** | **-0.003** | **-0.118** | **-0.345** | **-0.003** | **-0.100** | **-0.168** |  |
| **V52** | **0.642** | **0.245** | **0.001** | **0.000** | **-0.176** | **-0.201** | **0.105** | **-0.115** | **-0.213** |  |
| **V53** | **0.686** | **-0.001** | **-0.138** | **0.001** | **-0.115** | **-0.106** | **-0.004** | **0.002** | **-0.268** |  |
| **V54** | **-0.206** | **-0.464** | **-0.004** | **0.164** | **-0.139** | **0.144** | **0.189** | **-0.000** | **0.002** |  |
| **V55** | **0.368** | **0.515** | **0.003** | **0.119** | **-0.004** | **0.006** | **0.006** | **0.345** | **0.004** |  |
| **V6** | **0.648** | **0.178** | **0.209** | **-0.008** | **0.000** | **0.108** | **0.007** | **0.003** | **0.000** |  |
| **V7** | **0.485** | **0.228** | **0.323** | **0.339** | **-0.009** | **0.140** | **0.006** | **-0.009** | **0.009** |  |
| **V8** | **0.550** | **0.342** | **0.186** | **0.226** | **0.005** | **0.142** | **-0.141** | **-0.123** | **-0.001** |  |
| **V9** | **0.532** | **-0.006** | **-0.183** | **0.234** | **0.235** | **0.230** | **-0.169** | **-0.111** | **-0.136** |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **The first 9 Eigen values: 6.702;** | **3.259;** | **3.176; 3.038;** | **2.705;** | **2.599; 2.593;** | **2.578 and1.843** |
| **respectively.** |  |  |  |  |  |

**APPENDIX D: PRINCIPAL COMPONENT FACTORING OF ORGANISATIONAL EFFECTIVENESS VARIABLES BY VARIMAX ROTATION METHOD**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **FACTORS** | | | | | | |
| **Factor1** | **Factor2** | **Factor3** | **Factor4** | **Factor5** | **Factor6** | **Factor7** |
| **V1** | **0.630** | **-0.105** | **0.482** | **-0.111** | **-0.153** | **0.009** | **0.002** |
| **V10** | **0.278** | **-0.368** | **0.266** | **-0.003** | **0.396** | **0.124** | **0.513** |
| **V11** | **0.360** | **-0.002** | **0.264** | **0.449** | **0.353** | **0.218** | **0.180** |
| **V12** | **-0.431** | **-0.005** | **0.271** | **0.456** | **-0.316** | **0.174** | **0.118** |
| **V13** | **0.659** | **-0.005** | **-0.189** | **-0.311** | **0.233** | **0.004** | **0.000** |
| **V14** | **-0.559** | **0.112** | **0.288** | **0.332** | **-0.158** | **0.267** | **0.106** |
| **V15** | **0.533** | **0.445** | **-0.193** | **-0.194** | **0.009** | **-0.009** | **0.005** |
| **V16** | **-0.000** | **0.613** | **0.328** | **0.130** | **0.335** | **-0.199** | **-0.211** |
| **V17** | **-0.111** | **0.716** | **0.240** | **0.179** | **0.291** | **-0.149** | **0.009** |
| **V18** | **0.591** | **0.258** | **0.006** | **0.001** | **-0.429** | **-0.315** | **0.100** |
| **V19** | **0.486** | **0.383** | **0.156** | **0.224** | **-0.271** | **-0.173** | **0.255** |
| **V2** | **0.525** | **0.148** | **0.314** | **0.320** | **-0.007** | **-0.199** | **0.129** |
| **V20** | **0.659** | **0.257** | **-0.126** | **-0.007** | **-0.003** | **0.519** | **-0.132** |
| **V21** | **0.505** | **0.374** | **-0.006** | **-0.163** | **-0.311** | **0.578** | **0.000** |
| **V3** | **0.700** | **-0.299** | **-0.000** | **0.205** | **-0.102** | **-0.009** | **0.008** |
| **V4** | **0.601** | **-0.190** | **-.282** | **0.470** | **-0.205** | **-0.196** | **0.006** |
| **V5** | **0.506** | **0.004** | **-0.420** | **0.378** | **0.291** | **0.134** | **0.001** |
| **V6** | **0.578** | **-0.007** | **-0.352** | **0.343** | **0.132** | **-0.007** | **-0.227** |
| **V7** | **0.401** | **-0.286** | **0.295** | **0.166** | **-0.004** | **-0.155** | **-0.511** |
| **V8** | **0.478** | **-0.387** | **0.427** | **-0.192** | **0.007** | **-0.007** | **0.112** |
| **V9** | **0.293** | **-0.007** | **0.564** | **0.005** | **0.008** | **0.172** | **-0.451** |

**1ST 7 Eigen values: 2.396, 2.325, 2.254, 1.867, 1.840, 1.803 & 1.650 respectively.**

**APPENDIX E: PRINCIPAL COMPONENT FACTORING OF SAQ VARIABLES, THEIR LOADINGS AND NAMES.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Factor** | | | |
| **1** | **2** | **3** |  |
|  | **ECSIP** |  |  |  |
| V1 | 0.580 |  |  |  |
| V25 | 0.572 |  |  |  |
| V24 | 0.552 |  |  |  |
| V26 | 0.535 |  |  |  |
| V35 | 0.514 |  |  |  |
| V48 | 0.507 |  |  |  |
| V5 | 0.490 |  |  |  |
| V22 | 0.457 |  |  |  |
| V58 | 0.447 |  |  |  |
| V29 | 0.427 |  |  |  |
| V3 | 0.424 |  |  |  |
| V30 | 0.414 |  |  |  |
| V56 | 0.396 |  |  |  |
| V61 | 0.379 |  |  |  |
| V49 | 0.367 |  |  |  |
| V36 | 0.354 |  |  |  |
| V21 | 0.341 |  |  |  |
| V33 | 0.335 |  |  |  |
| V59 | 0.326 |  |  |  |
| V45 | 0.315 |  |  |  |
| V50 | 0.304 |  |  |  |
| V28 | 0.299 |  |  |  |
| V6 | 0.298 |  |  |  |
| V34 | 0.289 |  |  |  |
| V41 | 0.287 |  |  |  |
| V12 | 0.267 |  |  |  |
| V11 | 0.255 |  |  |  |
| V47 | 0.221 | \* |  |  |
| V52 | 0.207 | \* |  |  |
| V37 | 0.198 | \* |  |  |
| V14 | 0.185 | \* |  |  |
| V23 | 0.172 | \* |  |  |
| EMPLOYEES‟ | ATTITUDE T0 SAFETY | **CONSCIOUSNESS(EASC)** |  |  |
| V42 |  | 0.502 |  |  |
| V51 |  | 0.492 |  |  |
| V31 |  | 0.486 |  |  |
| V44 |  | 0.453 |  |  |
| V60 |  | 0.396 |  |  |
| V2 |  | 0.376 |  |  |
| V40 |  | 0.365 |  |  |
| V38 |  | 0.341 |  |  |
| V46 |  | 0.337 |  |  |
| V43 |  | 0.334 |  |  |
| V32 |  | 0.332 |  |  |
| V13 |  | 0.316 |  |  |
| V57 |  | 0.261 |  |  |
| V9 |  | 0.177 | \* |  |
|  |  |  | **ESP** |  |
| V16 |  |  | 0.585 |  |
| V18 |  |  | 0.580 |  |
| V17 |  |  | 0.533 |  |
| V20 |  |  | 0.527 |  |
| V54 |  |  | 0.438 |  |
| V19 |  |  | 0.419 |  |
| V8 |  |  | 0.414 |  |
| V10 |  |  | 0.385 |  |
| V55 |  |  | 0.380 |  |
| V27 |  |  | 0.348 |  |
| V53 |  |  | 0.346 |  |
| V39 |  |  | 0.315 |  |
| V15 |  |  | 0.270 |  |
| V4 |  |  | 0.232 | \* |
| V62 |  |  | 0.150 | \* |
| V7 |  |  | -0.193 | \* |

**Extraction method: Varimax Rotation with Kaiser Normalization \* Poorly weighted items.**

**APPENDIX F; SUMMARY OF FACTOR ANALYSIS OF SMPQ VARIABLES: THEIR LOADINGS AND NAMES:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **FACTORS** | | | | | | | | |
| **V/No.** | **Factor 1** | **Factor 2** | **Factor 3** | **Factor 4** | **Factor 5** | **Factor 6** | **Factor 7** | **Factor 8** | **Factor 9** |
| **Safety Audit, Inspection and Hazard Control** | **SAIHC** |  |  |  |  |  |  |  |  |
| V48 | 0.694 |  |  |  |  |  |  |  |  |
| V47 | 0.676 |  |  |  |  |  |  |  |  |
| V26 | 0.635 |  |  |  |  |  |  |  |  |
| V49 | 0.633 |  |  |  |  |  |  |  |  |
| V32 | 0.606 |  |  |  |  |  |  |  |  |
| V46 | 0.577 |  |  |  |  |  |  |  |  |
| V6 | 0.576 |  |  |  |  |  |  |  |  |
| V52 | 0.566 |  |  |  |  |  |  |  |  |
| V42 | 0.536 |  |  |  |  |  |  |  |  |
| V31 | 0.521 |  |  |  |  |  |  |  |  |
| V11 | 0.462 |  |  |  |  |  |  |  |  |
| V53 | 0.456 |  |  |  |  |  |  |  |  |
| V12 | 0.444 |  |  |  |  |  |  |  |  |
| V51 | 0.436 |  |  |  |  |  |  |  |  |
| V5 | 0.410 |  |  |  |  |  |  |  |  |
| **Health and Safety Policies and**  **Training** | | **HSPT** |  |  |  |  |  |  |  |
| V15 |  | 0.633 |  |  |  |  |  |  |  |
| V1 |  | 0.582 |  |  |  |  |  |  |  |
| V2 |  | 0.581 |  |  |  |  |  |  |  |
| V8 |  | 0.579 |  |  |  |  |  |  |  |
| V9 |  | 0.506 |  |  |  |  |  |  |  |
| V7 |  | 0.498 |  |  |  |  |  |  |  |
| V20 |  | 0.367 |  |  |  |  |  |  |  |
| **Leadership and Safety Motivations** | | | **LSM** |  |  |  |  |  |  |
| V13 |  |  | 0.611 |  |  |  |  |  |  |
| V45 |  |  | 0.505 |  |  |  |  |  |  |
| V28 |  |  | 0.504 |  |  |  |  |  |  |
| V43 |  |  | 0.500 |  |  |  |  |  |  |
| V41 |  |  | 0.460 |  |  |  |  |  |  |
| V16 |  |  | 0.430 |  |  |  |  |  |  |
| **Managerial Attitude to Organisational Safety** | | | | **MAOS** |  |  |  |  |  |
| V40 |  |  |  | 0.560 |  |  |  |  |  |
| V39 |  |  |  | 0.540 |  |  |  |  |  |
| V30 |  |  |  | 0.525 |  |  |  |  |  |
| V3 |  |  |  | 0.518 |  |  |  |  |  |
| V10 |  |  |  | 0.491 |  |  |  |  |  |
| V21 |  |  |  | 0.463 |  |  |  |  |  |
| **Employees‘ Welfare** | | | | | **EW** |  |  |  |  |
| V4 |  |  |  |  | 0.650 |  |  |  |  |
| V29 |  |  |  |  | 0.488 |  |  |  |  |
| V33 |  |  |  |  | 0.488 |  |  |  |  |
| V34 |  |  |  |  | 0.477 |  |  |  |  |
| V19 |  |  |  |  | 0.470 |  |  |  |  |
| V14 |  |  |  |  | 0.446 |  |  |  |  |
| V17 |  |  |  |  | 0.437 |  |  |  |  |
| V44 |  |  |  |  | 0.280 |  |  |  |  |
| **Provision Of Protective Equipment And Development Of Supervisors‘ Skills** | | | | | | **PPEDSS** |  |  |  |
| V38 |  |  |  |  |  | 0.658 |  |  |  |
| V50 |  |  |  |  |  | 0.526 |  |  |  |
| V37 |  |  |  |  |  | 0.504 |  |  |  |
| V54 |  |  |  |  |  | 0.478 |  |  |  |
| V55 |  |  |  |  |  | 0.425 |  |  |  |
| **Safety Promotion and Surveillance** | | | | | | | **SPS** |  |  |
| V23 |  |  |  |  |  |  | 0.607 |  |  |
| V24 |  |  |  |  |  |  | 0.534 |  |  |
| V18 |  |  |  |  |  |  | 0.511 |  |  |
| **Management Commitment to Safety** | | | | | | | | **MCS** |  |
| V25 |  |  |  |  |  |  |  | 0.658 |  |
| V36 |  |  |  |  |  |  |  | 0.606 |  |
| V27 |  |  |  |  |  |  |  | 0.572 |  |
| **Safety Communication** | | | | | | | | | **SC** |
| V22 |  |  |  |  |  |  |  |  | 0.618 |
| V35 |  |  |  |  |  |  |  |  | 0.517 |

**Extraction Method: Principal Component Analysis Rotation Method: Varimax with Kaiser Normalizati**

**APPENDIX G: SUMMARY OF FACTOR ANALYSIS OF ORGANISATIONAL EFFECTIVENESS VARIABLES: THEIR LOADINGS AND NAMES:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **VARIABLES** | **FACTORS** | | | | | | |
| **Factor1** | **Factor2** | **Factor3** | **Factor4** | **Factor5** | **Factor6** | **Factor7** |
| **Career Satisfaction** | **CS** |  |  |  |  |  |  |
| **V5** | **0.741** |  |  |  |  |  |  |
| **V4** | **0.734** |  |  |  |  |  |  |
| **V6** | **0.734** |  |  |  |  |  |  |
| **V3** | **0.484** |  |  |  |  |  |  |
| **Turnover Intention** | | **TOI** |  |  |  |  |  |
| **V13** |  | **0.649** |  |  |  |  |  |
| **V15** |  | **0.507** |  |  |  |  |  |
| **V12** |  | **-0.776** |  |  |  |  |  |
| **Organisational Goal** | | | **OG** |  |  |  |  |
| **V18** |  |  | **0.791** |  |  |  |  |
| **V19** |  |  | **0.698** |  |  |  |  |
| **V2** |  |  | **0.530** |  |  |  |  |
| **Interpersonal Relation** | | | | **IPR** |  |  |  |
| **V21** |  |  |  | **0.884** |  |  |  |
| **V20** |  |  |  | **0.795** |  |  |  |
| **Non-Work Satisfaction** | | | | | **NWS** |  |  |
| **V9** |  |  |  |  | **0.760** |  |  |
| **V7** |  |  |  |  | **0.739** |  |  |
| **V1** |  |  |  |  | **0.495** |  |  |
| **V8** |  |  |  |  | **0.425** |  |  |
| **Workplace Anxiety** | | | | | | **WPA** |  |
| **V17** |  |  |  |  |  | **0.826** |  |
| **V16** |  |  |  |  |  | **0.809** |  |
| **V14** |  |  |  |  |  | **0.145** |  |
| **Morale** | | | | | | | **M** |
| **V10** |  |  |  |  |  |  | **0.834** |
| **V11** |  |  |  |  |  |  | **0.548** |

**SEVEN FACTORS EXTRACTED**:

**APPENDIX H: ANOVA Summary of Multiple Regression Analysis to Determine level of Significant Contribution of SA & SMP to the Variance of OC**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| **Regression** | **64369.144** | **2** | **32184.572** | **74.83\*** | **P<0.05** |
| **Residual** | **256782.775** | **597** | **430.122** |  |  |
| **Total** | **321151.918** | **599** |  |  |  |

**\*Significant at P < 0.05, df = 2 & 597, Critical F = 3.00**

**APPENDIX I: ANOVA Summary of Multiple Regression Analysis to Determine level of Significant Contribution of SA & SMP to the Variance of JI**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| **Regression** | **6905.36** | **2** | **3452.68** | **40.66\*** | **P<0.05** |
| **Residual** | **50689.62** | **597** | **84.91** |  |  |
| **Total** | **57594.99** | **599** |  |  |  |

**\*Significant at P < 0.05, df = 2 & 597, Critical F = 3.00**

**APPENDIX J: ANOVA Summary of Multiple Regression Analysis**

**to Determine level of Significant Contribution of SA & SMP to the Variance of OE**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| **Regression** | **4631.35** | **2** | **2315.68** | **4.25\*** | **P<0.05** |
| **Residual** | **325022.03** | **597** | **544.43** |  |  |
| **Total** | **329653.39** | **599** |  |  |  |

**\*Significant at P < 0.05, df = 2 & 597, Critical F = 3.00**

**APPENDIX K : SOME REPORTED CASES OF ACCIDENTS/ HAZARDS IN NIGERIAN ORGANISATIONS AND THE EFFECTS (1983-2006)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S/N.** | **DATE.** | **NEWSPAPER.** | **NEWS HEADLINE**  **REPORT** | **CAUSE OF ACCIDENT/**  **HAZARDS** | **ORGANISATION INVOLVED.** | **EFFECTS OF ACCIDENT.** |
| 1. | 19/09/83 | Nigerian Tribune | “Chemical Explosion at  Johnson Wax”. | Chemical Explosion. | Johnson Wax | Death of Production  Engineer. |
| 2. | 19/05/ 87 | Nigerian Tribune. | “Two People  Die from Gas Poisoning”. | Gas Poisoning. | Gas Production Company. | Death of Two Workers. |
| 3. | 21/12/ 87 | Daily Times. | “Production  Engineers die in an Explosion”. | Explosion | NEPA and Individuals. | Death of NEPA Staff . |
| 4. | 03/10/ 97 | The Guardian. | “Afam Explosion Caused by Obsolete  Machine says NEPA”. | Obsolete Machine. | NEPA | Death of Workers. |
| 5. | 04/10/ 97 | THIS DAY | “Universal  Steels‟ Killer Machines”. | Obsolete Machines. | Universal Steel Company. | Death of Workers. |
| 6. | 08/10/ 97 | New Nigeria. | “NEPA donates to Families of Dead Engineers”. | Explosion | NEPA and Individual Families. | Death of NEPA Workers and Millions of Naira  spent as Compensation. |
| 7. | 10/10/ 97 | Daily Times | “Preventing the Repeat of Afam  Explosion”. | Explosion | NEPA and Individuals | Death of NEPA Staff. |
| 8. | 14/09/ 97 | Daily Champion. | “3 Dead as Power Station  Explodes”. | Explosion of Power  Station. | NEPA and Individuals  Customers. | Death of NEPA Workers and  customers. |
| 9. | 09/03/ 04 | The Guardian. | “Fire Without Remedy”. | Fire Outbreak | Onyimbo Market  ,Lagos | Property worth of  Millions of Naira Burnt. |
| 10 | 18/03/ 04 | The Guardian | “Students battle  fire at Ilorin Varsity”. | Fire Outbreak. | University of Ilorin. | Property worth of  millions of Naira damaged. |
| 11. | 29/04/ 04 | The Guardian | “Association seeks probe into Lagos Industrial Estate fire  Incidents” | Fire Outbreak | Lagos Industrial Estate. | Property worth of billions of Naira burnt . |
| 12. | 05/06/ 04 | Champion. | “Fire destroys 38 million Naira worth of property in  Osun”. | Fire Outbreak. | Osun State. | 38 million Naira worth of property destroyed. |
| 13 | 04/04 | The Guardian | “Maiduguri Timber razed:  50 million Naira Property losses”. | Fire | Maiduguri Timber Market. | 5o million Naira worth of property destroyed. |
| 14. | 20/04/ 04 | The Punch | “5,000 jobs lost as fire razes seven firms”. | Fire Outbreak. | Companies and Families in Lagos. | Billions of Naira lost, 150 Vehicles  burnt and 5,000 workers rendered  jobless. |
| 15. | 04/04 | The Vanguard | “Fire Razes Excellence Hotel  in Lagos”. | Fire Outbreak | Excellence Hotel, Lagos. | Millions of Naira lost. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 16. | Fri 04/04 | THISDAY | “What fire did to | Fire Outbreak | | Lagos State | | 3 Babies burnt; |
|  |  |  | Lagos |  | |  | | 200 families |
|  |  |  | Community: 3 |  | |  | | rendered |
|  |  |  | Babies |  | |  | | homeless and |
|  |  |  | Confirmed |  | |  | | Millions of Naira |
|  |  |  | burnt; 200 |  | |  | | lost. |
|  |  |  | families |  | |  | |  |
|  |  |  | rendered |  | |  | |  |
|  |  |  | homeless”. |  | |  | |  |
| 17. | 26/04/ 04 | The Guardian | “Abia Pipeline Inferno renders 100 homeless”. | | Pipeline Explosion | | NNPC and Abia Rural Dwellers. | Lost of lives and Property worth of Millions of Naira  destroyed. |
| 18. | 02/08/ 04 | THISDAY | “Anguish, Pain, Sorrow of Tejuosho Market  Fire”. | | Fire Outbreak | | Tejuosho Market | Billions of Naira lost. |
| 19. | 24/12/ 04 | THISDAY | “Pipeline Fire: 26 Bodies recovered,9 Custom Officers  Involved”. | | Explosion | | NNPC, Nigerian Customs and Rural Dwellers. | 26 Lives lost. |
| 20. | 05/08/ 04 | The Guardian | “Burning and | | Explosion | | NNPC and | Death of many |
|  |  |  | Wailing in a | |  | | Members of | people. |
|  |  |  | frightening fire: | |  | | Enugu |  |
|  |  |  | Pipeline fire | |  | | Community. |  |
|  |  |  | Disaster in | |  | |  |  |
|  |  |  | Enugu”. | |  | |  |  |
| 21. | 19/09/ 04 | The Guardian | “50 Bodies Recovered from  Explosion Site”. | | Explosion | | NNPC and the Rural Dwellers. | 50 People Died. |
| 22. | 13/09/ 04 | Champion | “Community Bank Complex Razed”. | | Fire | | Community Bank | Un- estimated Amount lost. |
| 23. | 26/08/04 | Champion | “103 People Die | | Fire | | - | Death of 103 |
|  |  |  | in fire Outbreak”. | |  | |  | people and |
|  |  |  |  | |  | |  | property worth of |
|  |  |  |  | |  | |  | millions of Naira |
|  |  |  |  | |  | |  | lost. |
| 24. | 06/07/04 | Champion | “Fire Guts | | Fire | | Obasanjo‟s Coy. | Millions of Naira |
|  |  |  | Obasanjo‟s | |  | | Fisheries. | lost. |
|  |  |  | Company | |  | |  |  |
|  |  |  | Fisheries in | |  | |  |  |
|  |  |  | Abeokuta”. | |  | |  |  |
| 25. | 23/09/04 | Champion | “Fire Guts Law  Chamber in Owerri. | | Fire | | Law Chamber in Owerri. | Unestimated. |
|  |  |  |  | |  | | NEMA | N111.035Million. |
|  |  |  |  | |  | | Veepee Industries & NIA | N341.489 million |
|  |  |  |  | |  | | Bhojsons &NIA | N243.686 million |
| 26. | 2004 | The Guardian | “Fire Claims gulf N6.58 Billion, top Insurance risk  chart”. | | Fire | | MTN Comm. &NIA | N212.511 million |
|  |  |  |  | |  | | Atlantic Textile Man. & NIA. | N160.101 million |
|  |  |  |  | |  | | Unilever  Companies Ltd & NIA. | N143.750 million |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | Parco Enterprises Ltd. & NIA. | N73..206 million |
| UAC & NIA | N71.875 million |
| First Bank of Nig  .PLC & NIA. | N59.258 million |
| Mouka Limited & NIA. | N50 .000 million |
| .27. | 22/01/05 | Champion | “Fire razes1,000  Custom cars” . | Fire | Nigerian Customs | Millions of Naira. |
| 28. | 23/02/05 | THISDAY | “Mega Plaza Inferno: Counting  the Loses”. | Fire | Mega Palaza | Unestimated |
| 29. | 30/05/05 | Daily Independent | “30 Injured in Ibadan Oil pipeline  Explosion” . | Pipeline Explosion | NNPC & People | Lives affected. |
| 30. | 26/12/06 | - | “Hundreds of Nigerians roasted  in fire”. | Pipeline Explosion | NNPC & Abule- Egba Residents. | Death of Over 300 people &  Waste of petrol. |

**Source**: Field Work

**APPENDIX L: CATALOGUE OF AIR TRAGEDIES IN NIGERIAN AVIATION INDUSTRY (1969-2005).**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S/ N** | **DATE** | **AIRCRA T NO.** | **ORGANISAT ION AFFECTED** | **PLACE OF ACCIDENT** | **CAUSE OF**  **ACCIDEN T** | **COST** |
| 1. | 20/11/67 | DC-10 | Nigerian  Government. | Ikeja Airport | - | 87 passengers  & crew died . |
| 2 | 1983 | Forkker 28 Aircraft | Nigerian Airways. | Enugu | - | 53 people on board died . |
| 3. | 1991 | - | Nigerian Prigrimes | Jeddah, Saudi Arabia . | - | 239 Nigerians died . |
| 4. | 1992 | Military C 130  Hercules plane | Nigerian Army | Ejigbo , Lagos . | - | 163 Military personnel & others died . |
| 5. | 1994 | - | Oriental Airline | Algeria | - | 5 Players of Iwuanyanwu Football Club  died . |
| 6. | 1994 | - | Nigerian Airways(Cargo Acraft ). | - | - | 2 Passengers died . |
| 7. | 1995 | Harka Airline RA  6561 | Harka Airline | - | - | 15 Passengers died . |
| 8. | 1995 | - | Nigerian Airways. | Kaduna | - | 77 Passengers killed , while 129 escaped  with injuries . |
| 9. | 1996 | - | Presidential Aircraft. | Warri | - | 14 People on board were killed . |
| 10. | 1996 | - | Nigerian Airways plane crashed. | Warri | - | No casualty. |
| 11. | 22/06/96 | - | Domier Aircraft | Jos | - | 12 killed |
| 12. | -/11/1996 | ADC  Boeing Aircraft | ADC | Itoikin, Epe | - | All 143 people on  board died. |
| 13. | 5/01/2000 | - | Sky-Power Express Aviation  Aircraft crashed. | - | - | 2people died. |
| 14. | -/ 06/  2000 | Aviation  Airline | Network  Aviation | Igbigbo near  Ikorodu, | - | The pilot  owner died. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Airline | Lagos |  |  |
| 15. | 2002 | - | Nigerian Airways  Aircraft | Approaching Ikeja Airport | Technical Fault | 100  passengers escaped death. |
| 16. | 4/05/02 | BAC 111 | EAS Aircraft crashed. | Kano | - | 150 people died. |
| 17. | 20/03/03 | Boeing 737 | ADC Airlines | Calabar Airport | Bird Struck on  the engine | 100  passengers escaped unhurt. |
| 18. | 24/12/04 | Boeing 727 | Chanchangi Airlines. | MMIA,  Lagos | Belly- landed after landing gear failed  to eject. | 74 passengers escaped death. |
| 19. | 25/02/05 | Boeing 737 | ADC Airlines | Yola Airport | Burst of rear tyres | 86 passengers saved. |
| 20. | 03/03/05 | - | Chanchangi Airlines | Nnamdi Azikiwe Int.Airport  Abuja. | Windstorm | No casualty |
| 21. | 27/03/05 | Boeing 737 | Bellview Airlines | Aminu Kano Int. Airport , Kano. | Fire outbreak  from the engine. | No casualty. |
| 22. | 11/06/ 05 | - | EAS Aircraft | Jos | Flood | 91 passengers escaped death. |
| 23. | 12/06/05 | Boeing 727 | Chanchangi Airlines | MMIA,  Lagos. | Ovreshooti ng of the run way by 100 meters because of  flood. | 135  Passengers escaped death. |
| 24. | 07/07/05 | - | Air France Airbus | Port Harcourt Int. Airport. | Taxied into a herd of cows on  the runway. | 350 Passengers and crew members  escaped death |
| 25. | 22/09/05 | Boeing 737-200  Bellview  110 | Bellview Airlines | Lisa, Ogun State | - | 117 Passengers died on board |
| 26. | 10/12/05 | D C-9 | Sosoliso Airlines | Port Harcourt Int. Airport | - | 110 People were killed. |

**Source: Field Synthesis**

**APPENDIX M: SITUATION AWARENESS AND OCCUPATIONAL SAFETY MANAGEMENT PROGRAMME TIPS (SAOSMPT):**

This is a 46-instructional sentence of dos and don‟ts on safety, designed by **Osuagwu, Sote & Omoluabi (2005)** for use in the industries and work organisations. The instrument is a non- quantitative, but qualitative statements designed as precautionary measures on safety habits for management studies of situation awareness and safety consciousness in the organisations. It is believed that when these safety habits are learnt by employees, they will have positive attitudes to safety consciousness (e.g

* Save your life and that of your colleagues.
* Be conscious of your environment.
* Think of safety every minute in your organisation.
* Try to know what that sound, odour or light is all about.
* Report every suspected unsafe behaviour.
* Don‟t rely only on your Safety/Security Department.
* Get concerned with your organisational safety.
* Comply with every safety rules/regulations/policies in your organisation.
* Believe you can help save the lives of others.
* Communicate to your management every accident no matter how minor.
* Check you office, table, electrical appliances etc first thing on entering the office and last thing while leaving your office.
* Everybody to be checking the unsafe attitudes and behaviours of coworkers.
* Management must reward safe attitudes.
* Management to give incentives for operating safely.
* Take time to know your environment.
* Think of any possible route of escape in case of danger/accident/emergency.
* Management must organize for emergency response training, safety instructions and training on safety alarm system for all workers.
* Use the necessary safety tools and apparatus for your job.
* Don‟t get involved in discussion while operating machine.
* Always read manuals for machine operation.
* Make sure there is fire extinguisher in or close to your office.
* Safety inspections must be conducted everyday.
* Keep record of daily unsafe behaviour.
* Review records of unsafe behaviour.
* Identify frequent unsafe behaviour.
* Discuss frequently occurring unsafe behaviour with management.
* Ensure that actions are taken in terms of control.
* Don‟t break work procedure.
* Don‟t bend the rules to achieve a target.
* Don‟t think you will do better by ignoring safety rules.
* Don‟t take shortcuts which involve little risk.
* Don‟t break safety rules because of incentives.
* Don‟t sabotage your organisational safety, you might be a victim.
* When you are a victim, your family members are victims.
* Accidents and hazards have no respect for anybody.
* Think of safety today to live for tomorrow.
* Safety preserves life and property.
* Accident is not only on the road, but also every where: In your house, office, even while climbing the staircase for your pay.
* What of the office pins, table knives, ordinary banana peel, wrong use of tools, lighted slip candles, slippery office toilet/ floor; the explosives in the factory, acids and other dangerous chemicals.
* Think of something to do to improve safety in your organisation.
* I am willing to remind my co-worker of any hazard in his job.
* I am willing to warn co-workers about working unsafely.
* I am willing to do whatever I can to improve safety, even to advice coworkers about their unsafe acts.
* I am willing to observe the work practices of a coworker (safe/unsafe behaviours).
* When I see a potential safety hazard, I am willing to correct it myself if possible etc

**Source: Field Work**

# APPENDICES

## APPENDIX N : DD/BIO DATA

**P/S/No**

Name(Optional) Sex Age Date **General Instruction:** These are statements meant to determine the nature and extent of activities carried out to promote health and safety in your organisation. Please, your name is not needed and therefore, no

information supplied here will be used against you. Please your personal data is needed for the purpose of

grouping the information supplied. Tick( ) where applicable.

1. Name of your Organisation: ……………………………………………………………………………….
2. Type of Organisation: (a) Public (b) Private
3. Sex: (a) Male (b) Female
4. Age: (a) 18 – 30yrs
5. 31 – 48 yrs
6. 4 9 - A bove
7. Marital Status: (a) Single
8. Widow
9. Married
10. Divorce /Separated
11. Highest Educational Qualification: (a) WAEC/GCE O/L
12. B.Sc/HND
13. OND/NCE/GCE A/L

(d) M.Sc./Ph.D.

1. Religion: (a) Christian

(b) Islam

1. Traditional
2. Othersspecify
3. Ethnicity: (a)Ibo

(b) Yoruba (c) Hausa

1. Othersspecify
2. Work Experience: (a) 1 – 5yrs
3. 16-20
4. 6 – 10yrs
5. 21 and above
6. 11 – 15
7. Cadre: (a) Junior

(b) Middle/Supervisor

Senior/Manager

1. Nature of work performed by your organisation: (a) Service ( c) Others (Specify)

(b)Production

1. Organisational status: (a) Entirely indigenous (multinational)

(c) Local foreign partnership

(b) Entirely Foreign

1. Number of employees (Management and non management staff) in your organisation:

(a) 1-50 (b) 51-150 (c) 151-300 (d) 301 - 500

## APPENDIX O: SAQ

**Name (Optional) Sex Age Date**

**INSTRUCTION:** The following are statements designed to find out how you get on with your organisation/work environment. It is not a test, so there are no wrong or right answers. Please, read each statement carefully and circle the appropriate number in each column to indicate how you interact with your work environment.

The numbers stand for:

1 = Strongly Disagree

2 = Disagree

3 = Slightly Disagree 0 = Neutral

5 = Slightly Agree

6 = Agree

7 = Strongly Agree

Now feel free to give your candid responses/ratings to the following statements.

|  |  |  |
| --- | --- | --- |
| 1 | I usually have adequate safety information regarding operational procedures in my organisation before during any work. | 1 2 3 0 5 6 7 |
| 2 | I perform better under pressure and I try to be faster than normal. | 1 2 3 0 5 6 7 |
| 3 | I usually know the information necessary for my operation in my work place. | 1 2 3 0 5 6 7 |
| 4 | I spend enough time to read information and observe things in my environment to determine which stimuli to attend to. | 1 2 3 0 5 6 7 |
| 5 | There is inadequate safety information on operational procedure in my organisation, as a result workers are easily confused when there is hazards. | 1 2 3 0 5 6 7 |
| 6 | I get easily confused when I know that I am being observed while performing my duty. | 1 2 3 0 5 6 7 |
| 7 | I am very sensitive and I react to things and information quickly and accurately. | 1 2 3 0 5 6 7 |
| 8 | I cannot stay a week without thinking about operating safety. | 1 2 3 0 5 6 7 |
| 9 | There is consistency in the use of supervisory staff in my organisation to avoid unforeseen. | 1 2 3 0 5 6 7 |
| 10 | Receiving instructions while performing my duties sometimes delays my rate of performance and I do not like it. | 1 2 3 0 5 6 7 |
| 11 | Most times I hardly hear safety alarm due to noise and distractions in my work environment. | 1 2 3 0 5 6 7 |
| 12 | I do not bother about safety matters because it is the responsibility of the Security Department in my organisation. | 1 2 3 0 5 6 7 |
| 13 | I try my best to make accurate use of the operational guidelines to perform my duties. | 1 2 3 0 5 6 7 |
| 14 | I am conscious of happenings in my environment and I spend time to monitor any change in the nature and process of things in my work environment. | 1 2 3 0 5 6 7 |
| 15 | Safety matters are confidential in my organisation as a result, I do not want to get involved. | 1 2 3 0 5 6 7 |
| 16 | Being conscious of happenings in my environment means working under fears which is not good for me. | 1 2 3 0 5 6 7 |
| 17 | To be at alert, I pay a great deal of attention to the objects, events and people at my work place, so as to avoid accident. | 1 2 3 0 5 6 7 |
| 18 | I regularly carry out personal inspections of my office premises to ensure things are always in order. | 1 2 3 0 5 6 7 |
| 19 | I have no difficulty in understanding safety information that would help me avoid accident at my work place. | 1 2 3 0 5 6 7 |
| 20 | I do not need to seek for help in interpreting safety information of any description in my organisation. | 1 2 3 0 5 6 7 |
| 21 | I always have the mental pictures of safety codes, signals and symbols that would help me  escape from danger in my work place. | 1 2 3 0 5 6 7 |
| 22 | I am called “Mr. Know it all” because I know what to do at any given time to get my job done without errors. | 1 2 3 0 5 6 7 |
| 23 | Organisational safety is not a serious issue in my work place, therefore I neither see nor read safety codes and signals that help in avoiding hazards. | 1 2 3 0 5 6 7 |
| 24 | I try quickly to differentiate between any unusual sound, odour, or light in my work place capable of causing hazards. | 1 2 3 0 5 6 7 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 25 | I have no stress, conflict or ambiguity in my job because I have a complete understanding of what my job requires to avoid doing it wrongly. | 1 | 2 | 3 | 0 | 5 | 6 | 7 |

|  |  |  |
| --- | --- | --- |
| 26 Last minute instructions and meeting short deadlines in accomplishing goals are common issues in my organisation. | 1 2 3 0 | 5 6 7 |
| 27 I do not like seeking for clarifications from my colleagues even when work procedures are altered without notice, because they hardly cooperate. | 1 2 3 0 | 5 6 7 |
| 28 Stress and pressure most times affect my understanding and my ability to perform my job accurately without errors. | 1 2 3 0 | 5 6 7 |
| 29 I am conversant with the methods and procedures of performing my job. | 1 2 3 0 | 5 6 7 |
| 30 I do understand and interpret safety information, objects and events in my work environment without difficulty, this prepares me against the unforeseen. | 1 2 3 0 | 5 6 7 |
| 31 I always make sure I know what to do before I do it. | 1 2 3 0 | 5 6 7 |
| 32 Most times, I make mistakes in interpreting and understanding work performance information due to task ambiguity. | 1 2 3 0 | 5 6 7 |
| 33 Even if I am not paid at the end of the month, I still try to understand the technicalities of my job. | 1 2 3 0 | 5 6 7 |
| 34 I often disregard safety rules and regulations that hamper my personal freedom in doing my job. | 1 2 3 0 | 5 6 7 |
| 35 I am a perfectionist, I always believe in doing things right. | 1 2 3 0 | 5 6 7 |
| 36 I prefer to do my own work and let others do theirs. | 1 2 3 0 | 5 6 7 |
| 37 I hate been supervised on the job because it lowers my integrity. | 1 2 3 0 | 5 6 7 |
| 38 I prefer to apply my personal strategies regardless of the established rules, since the most important thing is to achieve results. | 1 2 3 0 | 5 6 7 |
| 39 It is usual with me to make critical decisions about safety issues in my environment ahead of time. | 1 2 3 0 | 5 6 7 |
| 40 I cannot imagine myself thinking or planning ahead of any situation or event that is yet to happen. | 1 2 3 0 | 5 6 7 |
| 41 Most times I think ahead of what action to take at any critical time in my workplace and prepares for the consequence. | 1 2 3 0 | 5 6 7 |
| 42 If there is anything I can predict adequately is change in my work environment in terms of safety | 1 2 3 0 | 5 6 7 |
| 43 I do think of possible alternative solutions to a problem, even though I am yet to see one. | 1 2 3 0 | 5 6 7 |
| 44 I already have a safe working environment; therefore, I do not worry about safety. | 1 2 3 0 | 5 6 7 |
| 45 I try my best to avoid anything that will negatively affect my career. | 1 2 3 0 | 5 6 7 |
| 46 It is the duty of the Safety Department to plan and work for everyone’s safety. | 1 2 3 0 | 5 6 7 |
| 47 I am more concerned with my daily tasks than forecasting future events in the work place. | 1 2 3 0 | 5 6 7 |
| 48 I have the freedom to determine my future actions. | 1 2 3 0 | 5 6 7 |
| 49 I take moderate risks and stick my neck out to get ahead at work and achieve results. | 1 2 3 0 | 5 6 7 |
| 50 I strive to gain more control over the situations around me at my work place. | 1 2 3 0 | 5 6 7 |
| 51 I am hardly taken unawares in safety matters. | 1 2 3 0 | 5 6 7 |
| 52 Projections are mere fantasies that hardly come true, therefore I cannot waste my time projecting instead of getting things done as they come. | 1 2 3 0 | 5 6 7 |
| 53 I feel highly disturbed each time I am taken unawares on safety matters. | 1 2 3 0 | 5 6 7 |
| **OSUAGWU, F. A., SOTE, G. A. & OMOLUABI, P. F. (2005)** |  |  |

## APPENDIX P: SMPQ

Name(Optional) Sex Age Date

These are statements meant to determine the nature and extent of activities carried out to promote health and safety in your organisation. Please, you are to bear in mind that all information supplied will be treated with utmost confidentiality. Since your name is not needed, it will not be used against you. Carefully read each statement and circle the appropriate number in each column to indicate how health and safety activities are promoted by your organisational management.

The numbers stand for:

1 = Strongly Disagree

2 = Disagree

3 = Slightly Disagree 0 = Neutral

5 = Slightly Agree

6 = Agree

7 = Strongly Agree

Now feel free to give your candid opinion as accurately as possible by circling the appropriate number that best corresponds to your choice in each column.

|  |  |  |
| --- | --- | --- |
| 1 My organisation has corporate statement on health and safety matters. | 1 2 3 0 | 5 6 7 |
| 2 Rules and regulations on health and safety matters are strictly followed in my organisation. | 1 2 3 0 | 5 6 7 |
| 3 There are usually strict disciplinary measures against non-compliance to rules and regulations |  |  |
| on safety matters. | 1 2 3 0 | 5 6 7 |
| 4 My organisation has no serious regard for the health and safety of the employees. | 1 2 3 0 | 5 6 7 |
| 5 My organisation views health and safety as integral parts of competitiveness and profitability. | 1 2 3 0 | 5 6 7 |
| 6 My organisational management has well-established health and safety objectives. | 1 2 3 0 | 5 6 7 |
| 7 Management regularly assigns responsibilities on safety matters. | 1 2 3 0 | 5 6 7 |
| 8 Management visits worksites, offices and factory for the purpose of inspection. | 1 2 3 0 | 5 6 7 |
| 9 Management implements safety programmes, policies and procedures to the letter. | 1 2 3 0 | 5 6 7 |
| 10 Management does not get involved with the health and safety matters except when |  |  |
| emergencies (e.g. accidents and hazards) occur. | 1 2 3 0 | 5 6 7 |
| 11 My organisation has very high safety performance because I have not experienced any form |  |  |
| of accident since I became a staff of the organisation. | 1 2 3 0 | 5 6 7 |
| 12 Senior managers regularly visit work sites, offices and factories for the purpose of safety |  |  |
| inspections. | 1 2 3 0 | 5 6 7 |
| 13 Management is committed to the development of trusting relationships with subordinates on |  |  |
| safety matters. | 1 2 3 0 | 5 6 7 |
| 14 My organisation does not commit reasonable resources to safety matters or activities. | 1 2 3 0 | 5 6 7 |
| 15 More than 50% of the employees have gone for formal training on risk assessment and |  |  |
| control in the last five years. | 1 2 3 0 | 5 6 7 |
| 16 More than 50% of the staff have attended structured safety and health meetings and |  |  |
| workshops in the last three years. | 1 2 3 0 | 5 6 7 |
| 17 Workforce is never involved in setting health and safety objectives and discussing procedures |  |  |
| for risk control in my organisation. | 1 2 3 0 | 5 6 7 |
| 18 New employees are usually given superior training on safety matters to enhance their |  |  |
| commitment to organisational activities. | 1 2 3 0 | 5 6 7 |
| 19 I have not been given any training on safety matters since my employment in this |  |  |
| organisation. | 1 2 3 0 | 5 6 7 |
| 20 Re-training of old employees normally include: self-management team; Day-to-Day control of |  |  |
| risks; responsibility and decision making skills. | 1 2 3 0 | 5 6 7 |
| 21 My organisation undertakes not less than two safety promotion programmes annually. | 1 2 3 0 | 5 6 7 |
| 22 If at all there is a safety promotion programme done, the managers would prefer making |  |  |
| personal money from it to caring about its effectiveness. | 1 2 3 0 | 5 6 7 |
| 23 Health and safety promotion programmes are yearly affair in my organisation. | 1 2 3 0 | 5 6 7 |
| 24 The effectiveness of safety programmes in my organisation is regularly assessed and |  |  |
| monitored. | 1 2 3 0 | 5 6 7 |

|  |  |  |
| --- | --- | --- |
| 25 I do not think safety promotion programmes matter to my organisation because I have not seen one being organized before. | 1 2 3 0 | 5 6 7 |
| 26 The management of my organisation appreciates and rewards good safety behaviours and performances. | 1 2 3 0 | 5 6 7 |
| 27 I love my organisation because it demonstrates concern for the employees’ safety and health. | 1 2 3 0 | 5 6 7 |
| 28 My organisation has good welfare and insurance scheme for both accident and non-accident victims. | 1 2 3 0 | 5 6 7 |
| 29 I pray not to have injury at my place of work because my organisation may likely not bother about me. | 1 2 3 0 | 5 6 7 |
| 30 My organisation does not have a defined way of rewarding outstanding safety behaviour. | 1 2 3 0 | 5 6 7 |
| 31 There is effective co-operation between workers and management in all things even in safety matters. | 1 2 3 0 | 5 6 7 |
| 32 Informal contacts between workers and management exist in my organisation. | 1 2 3 0 | 5 6 7 |
| 33 Workers feel very free to meet managers to discuss their problems without fear or hindrance. | 1 2 3 0 | 5 6 7 |
| 34 Most times workers get frustrated trying to discuss issues with management. | 1 2 3 0 | 5 6 7 |
| 35 Workers often experience communication bottlenecks because of lack of feedback. | 1 2 3 0 | 5 6 7 |
| 36 My organisation is known for its prompt attention in the provision and maintenance of its equipment and facilities. | 1 2 3 0 | 5 6 7 |
| 37 I cannot imagine the seriousness of an organisation where protective wears and facilities are hardly provided. | 1 2 3 0 | 5 6 7 |
| 38 My organisation really needs new machines, equipment and working tools because the ones we use are now old, obsolete and hazardous. | 1 2 3 0 | 5 6 7 |
| 39 Workers have been promised to manage the tools that are used since an arrangement is being made for new ones, but the delay is affecting productivity. | 1 2 3 0 | 5 6 7 |
| 40 I am highly comfortable with the operational equipment and facilities in my organisation. | 1 2 3 0 | 5 6 7 |
| 41 Our managers are wonderfully inspiring, stimulating, considerate and provide sense of purpose in achieving, among other things, good health and safety for employees. | 1 2 3 0 | 5 6 7 |
| 42 Leadership in my organisation portrays an image of success, self-confidence and self-belief in safety matters. | 1 2 3 0 | 5 6 7 |
| 43 Managers in my organisation show mutual understanding and articulate shared goals when it comes to health issues. | 1 2 3 0 | 5 6 7 |
| 44 Managers in my organisation hardly reach at agreement on health and safety matters. | 1 2 3 0 | 5 6 7 |
| 45 My organisation is lacking good leadership on safety matters. | 1 2 3 0 | 5 6 7 |
| 46 The percentage of planned health and safety level achieved in my organisation is above 50%. | 1 2 3 0 | 5 6 7 |
| 47 The percentage of corrective actions achieved on safety is above 50%. | 1 2 3 0 | 5 6 7 |
| 48 The percentage of health and safety goals achieved in my organisation is above 50%. | 1 2 3 0 | 5 6 7 |
| 49 The percentage of safety inspection target achieved in my organisation is above 50%. | 1 2 3 0 | 5 6 7 |
| 50 My organisation may not have achieved more than 40% in each of the planning, corrective, goals and inspection regarding health and safety. | 1 2 3 0 | 5 6 7 |
| 51 Our supervisors are open and supportive in safety matters. | 1 2 3 0 | 5 6 7 |
| 52 There is combined involvement of supervisors and workers in safety issues in my organisation. | 1 2 3 0 | 5 6 7 |
| 53 There is usually regular involvement in training and meetings between supervisors and workers discussing safety. | 1 2 3 0 | 5 6 7 |
| 54 Our supervisors usually issue instructions and also push us too hard in order to meet production target. | 1 2 3 0 | 5 6 7 |
| 55 Our supervisors do not enjoy the autonomy required to take decisions on critical safety matters at work. | 1 2 3 0 | 5 6 7 |
| **OSUAGWU, F. A., SOTE, G. A. & OMOLUABI, P. F.(2005)** |  |  |

## APPENDIX Q: OCQ

**Name (Optional) Sex Age Date INSTRUCTION:** The following are statements designed to find out how you feel about your organisation or institution. It is not a test, so there are no right or wrong answers. Please read each statement carefully and

circle the appropriate number in the column provided to indicate how you feel about your organisation.

The numbers stand for:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | = | Strongly Disagree | | |
| 2. | = | Moderately Disagree | | |
| 3. | = | Slightly Disagree | | |
| 4. | = | Not sure | | |
| 5. | = | Slightly Agree | | |
| 6. | = | Moderately Agree | | |
| 7. | = | Strongly Agree | | |
| 1 This organisation has a fine tradition of public services. | | | 1 2 3 4 | 5 6 7 |
| 2 If I had my life to live over again, I would still choose to work for the organisation. | | | 1 2 3 4 | 5 6 7 |
| 3 I really feel as if this organisation’s problems are my problem. | | | 1 2 3 4 | 5 6 7 |
| 4 I feel a sense of pride in working for this organisation. | | | 1 2 3 4 | 5 6 7 |
| 5 The record of this organisation is an example of what dedicated people can achieve. | | | 1 2 3 4 | 5 6 7 |
| 6 I would advise a young college graduate to choose a management career in this organisation. | | | 1 2 3 4 | 5 6 7 |
| 7 The major satisfaction in my life comes from my job. | | | 1 2 3 4 | 5 6 7 |
| 8 I do what my job description requires: this organisation does not have the right to expect more. | | | 1 2 3 4 | 5 6 7 |
| 9 I don’t mind spending a half-hour past quitting time if I can finish a task. | | | 1 2 3 4 | 5 6 7 |
| 10 The most important things that happen to me involve my work. | | | 1 2 3 4 | 5 6 7 |
| 11 I live, eat and breathe my job. | | | 1 2 3 4 | 5 6 7 |
| 12 Most things in life are more important than my work. | | | 1 2 3 4 | 5 6 7 |
| 13 As long as I am doing the kind of work I enjoy, it doesn’t matter what particular organisation I work for. | | | 1 2 3 4 | 5 6 7 |
| 1. I feel a strong sense of loyalty toward this organisation. 2. If another organisation offered me more money for the same kind of the work, I would almost certainly accept. | | | 1 2 3 4  1 2 3 4 | 5 6 7  5 6 7 |
| 16 I have always felt that this organisation was a cold, unfriendly place to work. | | | 1 2 3 4 | 5 6 7 |
| 17 Over the years I have grown fond of this organisation as a place to live and work. | | | 1 2 3 4 | 5 6 7 |
| 18 Generally speaking, my career in this organisation has been satisfactory. | | | 1 2 3 4 | 5 6 7 |
| 19 I have warm feelings toward this organisation as a place to live and work. | | | 1 2 3 4 | 5 6 7 |
| 20 I have no particular feelings or sentiments toward this organisation at all. | | | 1 2 3 4 | 5 6 7 |
| 21 My loyalty is to my work not to any particular organisation. | | | 1 2 3 4 | 5 6 7 |
| 1. Few organisations can match this one as a good place to live and work. 2. Based on what I know now and what I believe I can expect, I would quite willing to spend the rest of my career with this organization | | | 1 2 3 4  1 2 3 4 | 5 6 7  5 6 7 |

**DEVELOPED BY: BUCHANAN (1974) :**

## APPENDIX R : JIQ

**Name (Optional) Sex Age Date INSTRUCTIONS:** The statements below relate to how you actually feel about your work. There are alternative responses from Strongly Disagree = 1 to Strongly Agree = 5. Please, circle the number in the

column that corresponds to each of your responses/ratings.

The numbers stand for:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1 I will stay overtime to finish a job, even if I am not paid for it. | 1 | 2 | 3 | 4 | 5 |
| 2 You can measure a person pretty well by how good a job he does. | 1 | 2 | 3 | 4 | 5 |
| 3 The major satisfaction in my life comes from my job. | 1 | 2 | 3 | 4 | 5 |
| 4 For me, mornings at work really fly by. | 1 | 2 | 3 | 4 | 5 |
| 5 I usually show up for work a little early, to get things ready. | 1 | 2 | 3 | 4 | 5 |
| 6 The most important things that happen to me involve my work. | 1 | 2 | 3 | 4 | 5 |
| 7 Sometimes I lie wake at night thinking ahead to the next day’s work. | 1 | 2 | 3 | 4 | 5 |
| 8 I am really perfectionist about my work. | 1 | 2 | 3 | 4 | 5 |
| 9 I feel depressed when I fail at some thing connected with my job. | 1 | 2 | 3 | 4 | 5 |
| 10 I have other activities more important than my work. | 1 | 2 | 3 | 4 | 5 |
| 11 I live, eat and breathe my job. | 1 | 2 | 3 | 4 | 5 |
| 12 It is my priority to get my work done each day. | 1 | 2 | 3 | 4 | 5 |
| 13 Quite often, I feel like staying home from work instead of coming in. | 1 | 2 | 3 | 4 | 5 |
| 14 To me, my work is only a small part of who I am. | 1 | 2 | 3 | 4 | 5 |
| 15 I am very much involved personally in my work. | 1 | 2 | 3 | 4 | 5 |
| 16 I avoid taking on extra duties and responsibilities in my work. | 1 | 2 | 3 | 4 | 5 |
| 17 I used to be more ambitious about my work than I am now. | 1 | 2 | 3 | 4 | 5 |
| 18 Most things in life are more important than work. | 1 | 2 | 3 | 4 | 5 |
| 19 I used to care more about my work, but now other things are more important to me. | 1 | 2 | 3 | 4 | 5 |
| 20 Sometimes I would like to kick myself for the mistakes I make in my work. | 1 | 2 | 3 | 4 | 5 |

**DEVELOPED BY: LODAHL & KEJNER (1965)**

## APPENDIX S: OEQ

Name (Optional) Sex Age Date **INSTRUCTION:** Read over these answer categories carefully and then answer the following questions by circling the number representing your response in each case. Consider how you feel about your organisation

before your response.

The numbers stand for:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | = Very dissatisfied |  | | | | |
| 2 | = Somewhat dissatisfied |
| 3 | = Neither satisfied nor dissatisfied |
| 4 | = Fairly satisfied |
| 5 | = Very satisfied |
| 1 |  | All in all, how satisfied are you with the persons in your office? | 1 | 2 | 3 | 4 | 5 |
| 2 |  | All in all, how satisfied are you with the persons in your supervisors? | 1 | 2 | 3 | 4 | 5 |
| 3 |  | All in all, how satisfied are you with your job? | 1 | 2 | 3 | 4 | 5 |
| 4 |  | All in all, how satisfied are you with this company, compared to most others? | 1 | 2 | 3 | 4 | 5 |
| 5 |  | How satisfied are you with the career progress you have made in this organisation up to now? |  |  |  |  |  |
|  |  |  | 1 | 2 | 3 | 4 | 5 |
| 6 |  | How satisfied are you with the career advancement in this organisation in the future? |  |  |  |  |  |
|  |  |  | 1 | 2 | 3 | 4 | 5 |
| 7 |  | How satisfied are you with the city the city or place you live? | 1 | 2 | 3 | 4 | 5 |
| 8 |  | How satisfied are you with your friendship? | 1 | 2 | 3 | 4 | 5 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 9 | How satisfied are you with your non-working activities, hobbies and so on? | 1 2 3 | 4 | 5 |
| 10 | How satisfied are you with your health and physical conditions? | 1 2 3 | 4 | 5 |
| 11 | How satisfied are you with the recognition you get from accomplishments in your personal life? | 1 2 3 | 4 | 5 |
| 12. | Which of the following statements most clearly reflect your feelings about your future with this organisation in the next year? |  |  |  |

13.

|  |  |  |
| --- | --- | --- |
| 1 | = | I definitely will not leave |
| 2 | = | I probably will not leave |
| 3 | = | I am uncertain |
| 4 | = | I probably will leave |
| 5 | = | I definitely will leave |
| How do you feel about leaving this organisation? | | |
| 1 | = | I am presently looking and planning to leave |
| 2 | = | I am seriously considering leaving in the near future |
| 3 | = | I have no feelings about this, one way or the other |
| 4 | = | As far I can see ahead, I intend to stay with this organisation |
| 5 | = | It is very unlikely that I would ever consider leaving this organisation |

1. If you were completely free to-choose, would you prefer or not prefer to continue to working for this organisation?

1. = Prefer very much to continue working for this organisation

2. = Prefer to work here

3. = Don’t care either way

4. = Prefer not to work here

5. = Prefer very much not to continue working for this organisation

1. How important is it to you personally that you spend your career in this organisation rather than some other organisation?

1. = It is of no importance at all

2. = I have mixed feelings about its importance

3. = It is of some importance

4. = It is fairly important

5. = It is very important for me to spend my career in this organisation

1. To what extent do you find it difficult to sleep at night because you keep thinking of what happened at work during the day?

1. = To a very little extent

2. = To a little extent

3. = To some extent

4. = To a great extent

5. = To a very great extent

1. To what extent does your job make you feel nervous and jumpy?

1. = To a very little extent

2. = To a little extent

3. = To some extent

4. = To a great extent

5. = To a very great extent

1. To what extent do you think this organisation is able to achieve its goals and objectives?

1. = To a very little extent

2. = To a little extent

3. = To some extent

4. = To a great extent

5. = To a very great extent

1. To what extent do you think this organisation is able to attract and retain high-level manpower?

1. = To a very little extent

2. = To a little extent

3. = To some extent

4. = To a great extent

5. = To a very great extent

1. If you were to assess interpersonal relationship within your organisation setting, would you say it is:

1. = Very uncooperative

2. = Uncooperative

3. = Somewhat cooperative

4. = Cooperative

5. = Very cooperative

1. If you were to assess interpersonal relationship departments within your organisation (i.e. subsystem relationship, would you say it is:

1. = Very uncooperative

2. = Uncooperative

3. = Somewhat cooperative

4. = Cooperative

5. = Very cooperative

**Developed by: Pennings (1976); Romzek (1989); Shore & Martins (1989) & Gbadamosi (1995): Revalidated with Nigerian samples by: OSUAGWU, F. A. & SOTE, G. A. (2005).**

## APPENDIX T: SUPPLEMENTARY QUESTIONNAIRE (SQ)

**Please, complete the following:**

1. Have you experienced accident in your organisation before (i.e. seen or involved - not motor accident)
   1. No (b) Yes
2. Do you think your organisation needs safety improvement? (a) No (b) Yes
3. I am not interested
4. Can unsafe and unhealthy organisational environment have negative effect on your commitment to your organisation? (a) Yes (b) No
5. Can lack of organisational safety affect your general performance at work?
   1. No (b) Yes
6. Whom will you blame most for lack of good safety practices in your organisation?

(a) Employees (b) Supervisors (c) Management

1. a and b

**OSUAGWU, F. A. (2005)**

## APPENDIX U: SAQ MANUAL

Situation Awareness Questionnaire (SAQ) was developed and standardized for professional use in Nigerian organisations .To enhance its suitability and relevance in the Nigerian industrial –organisations, the standardization samples were obtained from the organisations whose activities/operations are prone to accidents and hazards.

**Authors:**

**Osuagwu, F. A., Sote, G. A. & Omoluabi, P. F. (2005) Purpose:**

1. To measure the situation awareness/safety consciousness of workers in industrial- organisations;
2. To screen workers into three level of situation awareness; and
3. To determine the level of error of situation awareness most prevalent in industrial – organisational accidents/hazards in Nigerian organisations.

**Description:**

The 53 item inventory is designed to assess the job-related situation awareness/safety consciousness of workers in their work environment. According to Endsley (1996), situation awareness is defined as “ the perception of the element in the environment within a volume of space and time , the comprehension of their meanings , and the projection of their status in the near future .” Though Endsley identified three components of situation awareness to include perception, comprehension and projection ; the present study through factor analysis merged these components into two ,while identifying attitude as the third component factor of situation awareness .

In this study therefore, the three principal factors or levels of situation awareness are named as follows:

1. Employees’ Comprehension of Safety Information and Projection (ECSIP)
2. Employees’ Attitudes to Safety Consciousness (EAC)
3. Employees’ Safety Perception (ESP)

**Administraion:** SAQ should be administered individually or in groups after establishing adequate rapport with clients/participants. Professionals or test administrators should encourage the participants to read and comply with the instruction at the top of the test form. There are no time limit for completing SAQ.

**Scoring:**There is direct scoring and reverse scoring of the items.

1. **Direct Scoring:** Add together the values of the numbers shaded or circled in the relevant items. For example , if in items 1 , 3 , 5 , 7, 10 , 11 , and 12 the numbers circled or marked are 5 , 6 , 7 , 5 , 4 , 5 , 1 respectively , the score for the seven items is 5+6+7+5+4+5+1 =33
2. **Reverse Scoring:** Here , the values of the numbers are changed from 1 , 2 , 3 , 4 , 5 , 6 , 7 , to 7 , 6 , 5 , 4 , 3 ,2 , 1 respectively , and the reversed values of the numbers marked or circled in the relevant items are now added together . For example , if in items 2 , 5 , 6 , 10 , 15 , 16 , 23 , the marked numbers are 1 ,3 , 7 , 1 , 2 , 4 , 6 respectively , the reverse score for the seven items will be 7 +5+1+7+6+4+2 =32
3. **Direct Scoring Items:** Direct scoring items include the following ; 1 ,3 , 4 , 7 , 8 , 9 , 13 , 14 , 17 ,

18 , 19 , 20 , 21 , 22 , 24 , 25 , 29 , 30 , 31 , 33 , 35 , 39 , 41 , 42 , 43 , 45 , 48 , 50 , 51 , and 53 .

1. ReverseScoringItems:

Reverse scoring items include the following ; 2 , 5 , 6 , 10 , 11 , 12 , 15 , 16 , 23 , 26 , 27 , 28 , 32 , 34 ,

36 , 37 , 38 , 40 , 44 , 46 , 47 , 49 , and 52 .

1. **Items For Each Scale:**
   1. **ECSIP :** 1 , 3 , 5 , 6 , 11 , 12 , 21 , 22 , 24 , 25 , 26 , 28 , 29 , 30 , 33 , 34 ,

35 , 36 , 41 , 45 , 48 , 49 , 50 , 56 , 58 , 59 and 61 .

* 1. **EASC :** 2 , 13 , 31 , 32 , 38 , 40 , 42 , 43 , 44 , 46 , 51 , 57 and 60 .
  2. **ESP :** 8 , 10 , 15 , 16 , 17 , 18 , 19 , 20 , 27 , 39 , 53 , 54 , and 55
  3. **SAQ Overall:** All the 53 items

1. Put letter **A** by the sides of all ECSIP items; letter **B** by the sides of all EASC items and letter **C**

by the sides of all ESP items respectively.

1. Add together the values of all the direct and reverse scores of letter **A** items for ECSIP; letter **B** items for EASC and letter **C** items for ESP, thereby representing each scale .
2. The overall situation awareness (SAQ) score is the addition of the scores/values of the 53 items of the entire scale.

**Pschometric Properties:**

Psychometric properties for Nigerian samples were obtained by the authors

**: Osuagwu, F. A., Sote, G. A., & Omoluabi, P. F.(2005) Norms:**

The norms reported here are the mean scores obtained by workers in some selected accident/ hazard prone organisations in Nigeria.

|  |  |  |  |
| --- | --- | --- | --- |
| **Scales:** | **M (n=300)** | **F (n=300)** | **M &F (N=600)** |
| i. ECSIP | 137. 73 | 135 . 03 | 136 . 38 |
| ii. EASC | 58. 56 | 55 . 04 | 56 . 80 |
| iii. ESP | 65. 56 | 64 . 35 | 64 . 95 |
| iv. Overall  **Reliability:** | SAQ 260 . 05 | 255 . 51 | 257 . 78 |
| The reliabilit  **Scale** | y coefficients obtained are as follows:  **Chronbach Alpha** | | |
| i. ECSIP | 0 . 81 | | |
| ii. EASC | 0 . 64 | | |
| iii. ESP | 0 . 61 | | |

iv. Overall SAQ 0 . 76 ; Guttman Split- half = 0 .70 ; Spearman – Brown = 0 . 76

**Validity:**

SAQ and its sub-tests were correlated with Offshore Safety Questionnaire(OSQ) developed by Rundmo (1994) and the following concurrent validity coefficients were obtained:

i. ECSIP 0 . 513

|  |  |
| --- | --- |
| ii. EASC | 0 . 210 |
| iii. ESP | 0 .604 |
| iv .Overall SAQ | 0 . 767 |

**Interpretation:** The Nigerian norms or mean scores are the basis for interpreting the scores of clients . Scores higher than the norms indicate adequate /high awareness

in the specific level or in the overall situation awareness as case may be .

**References:**

Endsley, M. R.(1995) . Towards a theory of situation awareness in dynamic Systems . Human Factors, 37(1) , 32-64 .

Rundmo,.T. (1994) . Associations between organisational factors and safety and contingency measures on offshore petroleum platforms .Scandinavian Journal of Work Environment and Health, 20,122-1127.

## APPENDIX V: SMPQ MANUAL:

Safety management practices questionnaire (SMPQ) is developed, Standardized and validated to enhance its suitability and relevance for Professional use in Nigerian organisations .The short version of the SMPQ Manual reflects the outcomes of the entire processes.

**Authors: Osuagwu, F .A ., Sote , G .A .& Omoluabi, P. F. (2005). Purpose:**

1. To determine the nature of safety management practices prevalent in the Nigerian industries/organisations;
2. To assess the perceptions of the three cadres (workforce, supervisors and managers) of organisational workers on safety management practices in Nigerian organisations; and
3. To identify safety needs of workers in the accident/hazard prone organisations in Nigeria.

**Description:** The 55-item inventory is designed on 7-point scale to assess the safety management practices in the Nigerian Organisations. Safety management relates to the actual practices, roles and functions associated with remaining safe (Kirwan, 1998). It involves what an organisation should be doing to protect its workers, the public and the environment from harm . The activities involved in this regard factored into nine major components to include the following:

* 1. Safety Audit, Inspection and Hazard Control (SAHC)
  2. Health and Safety Policies and Training (HSPT)
  3. Leadership and Safety Motivations (LSM)
  4. Managerial Attitudes to Organisational Safety (MAOS)
  5. Employees’ Welfare (EW)
  6. Provsion of Protective Equipment and Development of Supervisors Skill (PPEDSS).
  7. Safety Promotion and Surveillance (SPS).
  8. Management Commitment to Safety (MCS) and
  9. Safety Communications (SC)

**Administration:** SMPQ should be administered individually or collectively as a group after establishing adequate rapport with clients/participants. The participants should be encouraged to read and comply with the instruction at the top of the test form. The professionals or test administrators should help the semi-literate clients/participants to carry out the instruction. There are no right or wrong answers and also, no time limit in completing SMPQ.

**Scoring:** There is direct scoring as well as reverse scoring of items.

* + 1. **Direct Scoring:** Add together the values of the numbers ticked, circled or shaded in the relevant items. For instance , if in items 1 , 2 , 3 , 5 , 6 , 7 , 8 , 9 , 11 , the values ticked , circled or shaded are 7 , 5 , 3 , 4 , 3 , 1 , 6 , 2 and 5 respectively , the score for the nine items is

7+5+3+4+3+1+6+2+5=36.

* + 1. **Reverse Scoring:** In reverse scoring , the values of the numbers are changed from 1 , 2 , 3 , 4 , 5 , 6 , 7 to 7 , 6 , 5 , 4 , 3 , 2 , and 1 respectively . The reversed values of the numbers circled or shaded by the participants in the relevant items are added together. For example , if in items 4 , 10

, 14 , 17 , 19 , 22 , 25 , 29 , and 34 , the numbers/values circled , marked or shaded are 1 , 3 , 4 , 2 , 5 , 7 , 6 , 5 , and 2 respectively , the reversed score for the nine items is 7+5+4+6+3+1+2+3+6=37.

* + 1. **Direct Scoring Items:** The direct scoring items include the following;

1 , 2 , 3 , 5 , 6 , 7 , 8 , 9 , 11 , 12 , 13 , 15 , 16 , 18 , 20 , 21 , 23 , 24 , 26 , 27 , 28 , 31 , 32 , 33 , 36 , 40 , 41 ,

42 , 43 , 46 , 47 , 48 , 49 , 51 , 52 , and 53 .

* + 1. **Reverse Scoring Items :**These include the following ; 4 , 10 , 14 , 17 , 19 , 22 , 25 , 29 , 30 , 34 , 35 , 37

, 38 , 39 , 44 , 45 , 50 , 54 , and 55 .

* + 1. **The Items for the nine sub- scales:**
       1. HSAIHC : 5 , 6 , 11 , 12 , 26 , 31 , 32 , 42 , 46 , 47 , 48 , 49 , 51 , 52 , and 53
       2. HSPT: 1 , 2 , 7 , 8 , 9 , 15 , and 20 .
       3. LSM : 13 , 16 , 28 , 41 , 43 , and 45 .
       4. MAOS: 3 ,10 , 21 , 30 , 39 ,and 40 .
       5. EW : 4 , 14 , 17 , 19 , 29 , 33 , 34 , and 44 .
       6. PPEDSS: 37 , 38 , 50 , 54 , and 55 .
       7. SPS : 18 , 23 , and 24 .
       8. MCS : 25 , 27 , and 36 .
       9. SC: 22 and 35 .
       10. SMPQ Overall ; All the 55 items in the scale .
    2. Put letters **A , B , C , D , E , F , G , H , or I** by the sides of the items in each scale (SAIHC ; HSPT ; LSM ; MAOS ; EW ; PPEDSS ; SPS ; MCS ; & SC) respectively .
    3. Add together the values of all the direct and reverse score items of each of the letters A –I independently for the nine sub-scales.
    4. The overall safety management practices score is the sum of all the scores or values of all the 55 items in the SMPQ scale

**Psychometric Properties:**

Psychometric properties were obtained by the authors: **Osuagwu, F .A., Sote, G. A. & Omoluabi, P. F. (2005) .**

**Norms:** The norms reported here are the mean scores obtained by workers in different organisations in Nigeria.

|  |  |  |  |
| --- | --- | --- | --- |
| **Scales** | **M (n = 300)** | **F (n = 300)** | **M & F (N = 600)** |
| 1. HSAIHC | 58 .54 | 60 .51 | 59 .43 |
| 2. HSPT | 29 .82 | 29.95 | 29 .88 |
| 3. LSM | 21 .11 | 23 .61 | 22.25 |
| 4. MAOS | 19 .92 | 21 .31 | 20 .55 |
| 5. EW | 31 .18 | 31 .37 | 31 .27 |
| 6. PPEDSS | 16 .14 | 16 .22 | 16 .18 |
| 7. SPS | 12 .17 | 12 .29 | 12 .22 |
| 8. MCS | 12 .63 | 12 .32 | 12 .49 |
| 9. SC | 7 .20 | 7.66 | 7 .41 |
| 10. SMPQ overall | 227 .56 | 232 .24 | 229 .89 |

**Reliability:** The reliability coefficients obtained by the authors are as follows: Scale: Chronbach Alpha:

* + - 1. HSAIHC 0.89
      2. HSPT 0.80
      3. LSM 0.75
      4. MAOS 0.66
      5. EW 0.63
      6. PPEDSS 0.61
      7. SPS 0.49
      8. MCS 0.63
      9. SC 1.0
      10. SMPQ Overall 0.87; Guttmam Split-half =0 . 91; Spearman –Brown =0.91

**Validity:** SMPQ was correlated with Offshore Safety Questionnaire (OSQ) developed by Rundmo (1994) and the following concurrent validity coefficients were obtained:

|  |  |
| --- | --- |
| 1. HSAIHC | 0. 702 |
| 2. HSPT | 0.612 |
| 3. LSM | 0. 721 |
| 4. MAOS | 0.478 |
| 5. EW | 0.722 |
| 6. PPEDSS | 0.710 |
| 7. SPS | 0.595 |
| 8. MCS | 0.542 |
| 9. SC | 0.432 |
| 10. SMPQ Overall | 0.831 |

**Interpretation:** The Nigerian norms or mean scores are the basis for interpreting the scores of clients/participants. Scores higher than the norms indicate adequate or proficient safety management practices in the specific scale(s) or in the overall SMPQ as case may be.

**Refernces:**

Kirwan, B. (1998). *Safety Management: The Challenge of Change,* Elsevier, Oxford,

Pp. 67 – 92.

Mearns, K., Flin, R., Gordon, R.., Fleming, M. (1998) “Measuring Safety Climate on Offshore Installations”. *Works and Stress,* 12, 238 – 254.

Rundmo, T. (1994) “Association between organisational factors and Safety and Contingency Measures on Offshore Petroleum Platforms.” *Scandinavian Journal of Work Environment and Health,* 20, 128 – 131.

**APPENDIX W: OEQ MANUAL**

The OEQ was adapted for use in this study, hence revalidated in order to enhance its suitability and relevance in the study and for professional use in Nigerian organisations. This short version of the OEQ manual reflects the outcome of the adaptation.

**Authors: Pennings (1976); Romzek (1989); & Shore & Martins (1989).**

**Nigerian Re-validators: Osuagwu, F.A. ; SOTE, G. A.& Omoluabi, P. F. (2005).**

**Purpose:** To enhance the suitability and relevance for the measurement of organisational effectiveness in Nigeria .

**Description:** The 21 –item inventory designed by the above named authors on a 5-point Likert format , is a battery of tests measuring behaviourial effectiveness in the achievement of organisational goals .The behavioural measures are considered as the intervening behavioural variables which are chosen not only for their relevance to the independent variables , but because they have wide acceptance and usage in the literature .Through factor analysis , the following seven components which formed the sub-scales of Organisational Effectiveness t

est ( OEQ) were identified .

1. Career Satisfaction (CS) 2. Turnover Intention (TOI) 3. Organisational Goal (OG) 4. Interpersonal Relation (IPR) 5. Non-work Satisfaction (NWS) 6. Work-place Anxiety (WPA) 7. Moral (M) **Administration:** OEQ should be administered individually or in groups after establishing adequate rapport with clients / participants .The participants should be encouraged to read and comply with the instruction at the top of the test form . The professionals / test administrators should help the semi-literate clients / participants to carry out the instruction .There are no right or wrong answers; and also, no time limit in completing OEQ test.

**Scoring:**

There is only direct scoring of items.

**(a)**. **Direct Scoring :**Add together the values of the numbers ticked, circled or shaded in the relevant items. For instance , if in items 1 , 2 , 3 , 4 , 5 , 6 , and 9 , the values circled or ticked are 3 , 4 , 5 , 7 , 6 , 2 , and 1 respectively , the score for the seven items is 3+4+5+7+6+2+1 = 28 . All the 21 items in the test are scored directly.

1. **The Items of the Seven Sub-scales:**
   1. Career Satisfaction (CS) = 3 , 4 , 5 & 6 .
   2. Turnover Intention (TOI) = 12 , 13 , & 15 .
   3. Organisational Goal (OG) = 2 , 18 , & 19 .
   4. Interpersonal Relation (IPR) = 20, & 21.
   5. Non-Work Satisfaction (NWS) = 1, 7, 8 & 9 .
   6. Work-Place Anxiety (WPA) = 14 , 16 , & 17 .
   7. Moral (M) = 10 & 11 .
   8. OEQ Overall: All the 21 items of the scales .
2. Put letters **A, B , C , D , E , F , & G** by the sides of the items in each scale (CS ; TOI ; OG ; IPR ; NWS ; WPA ; & M ) respectively.
3. Add directly together the values circled or shaded against the items for each of the letters (**A – G**) independently for the seven scales.
4. The overall Organisational Effectiveness measure (OEQ) is the addition of all the scores or values of the 21 items of the scale / test.

**Psychometric Properties:**

Psychometric properties for Nigerian samples were obtained by the re-validators: **Osuagwu, F. A. , & Sote, G . A. (2006) .**

**Norms:**

The norms reported here are the mean scores obtained by workers in different Nigerian organisations.

**Scales M (n =300) F( n = 300 ) M & F( N = 600 )**

1. Career Satisfaction (CS) 14 .03 14 .34 14.17

|  |  |  |  |
| --- | --- | --- | --- |
| 2. Turnover Intention (TOI) | 8 .73 | 9 .49 | 9. 08 |
| 3. Organisational Goal (OG) | 9 .68 | 10 .22 | 9. 92 |
| 4. Interpersonal Relation (IPR) | 6 .65 | 7 .00 | 6. 81 |
| 5. Non-Work Satisfaction (NWS) | 15 .82 | 15 .63 | 15. 73 |
| 6. Workplace Anxiety (WPA) | 7 .51 | 7 .93 | 7. 70 |
| 7. Morale (M) | 7.93 | 8 .10 | 8. 01 |
| 8. OEQ Overall | 73.95 | 76 .76 | 75.35 |
| **Reliability:** |  |  |  |

The reliability coefficients of Chronbach Alpha obtained with Nigerian samples against foreign samples are as follows:

**Scale Foreign Samples Nigerian Samples**

Chronbach alpha

1. Career Satisfaction (CS) 0 .70 0 .78

1. .Turnover Intention (TOI) 0 .74 - 0 .75
2. .Organisational Goal (OG) - 0 .66
3. .Interpersonal Relation (IPR) - 0 .80
4. Non-Work Satisfaction (NWS) 0 .73 0 .66
5. Workplace Anxiety (WPA) 0 .63 0 .51
6. Morale (M) 0 .73 0 .18
7. OEQ Overall - 0. 76 Guttman Split-half 0.76 0 .59; Spearman –Brown (Odd vs Even) 0 .61

**Validity:**

OEQ was correlated with Organisational Commitment Questionnaire (OCQ) developed by Buchanan (1974), and the following concurrent validity coefficients were obtained:

1. Career Satisfaction (CS) 0.352
2. Turnover Intention (TOI) 0.394
3. Organisational Goal (OG) 0.319
4. Interpersonal Relation (IPR) 0.345
5. Non-Work Satisfaction (NWS) 0.360
6. Work -Place Anxiety (WPA) 0.003
7. Morale (M) 0.216
8. OEQ Overall 0.485

**Interpretation:** The Nigeria norms or mean scores are the basis for interpreting the scores of clients / participants. Scores higher than the norms indicate organisational effectiveness, while scores lower than the norms or mean scores indicate organisational ineffectiveness.

**References:** Gbadamosi, G. (1996). The effects of organisational commitment and communication on organisational effectiveness in the Nigerian banking industry: Ph. D Thesis submitted to the Department of Business Administration, University of Lagos, Nigeria.

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