Health, Safety and Environmental Implications in Nigeria’s Oil and Gas Industry

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October 2012
DECLARATION

I, Na’ankwat Lami Dabup do hereby declare that this thesis is my own work. The data used in the completion of this thesis were taken from both primary and secondary sources. Where secondary sources were used reference has been made to them. I certify that this thesis has not been previously submitted to any other university.

Signature:

Date: 15 October 2012
DEDICATION

This thesis is dedicated to God Almighty in whom I am. Also to my:

Parents:
  • DIG PL Dabup, and
  • TD Olorunsaiye;

Siblings:
  • Philip, Ibrahim, Replong, Matyil and Bala, and

My nieces and nephews:
  • Fiona, Enne-attah, Isaiah and Kayode.
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Abstract

Multinational oil companies (MNOCs) operating in Nigeria have been severely criticised by both local and international pressure groups for engaging in unwholesome health, safety and environmental practices resulting in widespread ecological disturbances, including pollution from pipe-line leaks, blowouts, drilling fluids and refinery effluents, land alienation and disruption of the natural terrain during oil and gas operations. Protests from host communities have escalated into an all-out assault on oil companies and their workers. The resulting impact has been violent with raids on both onshore and off-shore oil facilities and infrastructure, shutdowns of oil wells, and recurrent cases of kidnapping of workers by rebel groups. This has engendered an atmosphere of insecurity in the sector and has brought to the forefront the issues of health, safety and environmental (HS&E) management.

This study aims at determining the implications of poor HS&E management practices in Nigeria’s oil and gas industry, evolving interventions, and developing a model which focuses on strategic HS&E management incorporating purposeful business environment assessment, rethinking strategy, best practices and achieving excellence in HS&E management. Statistical software and tools were used in the analysis of data for the study. The sample population consists of engineers, geologists, project managers and HS&E managers in MNOCs in Nigeria, constituting the geographical delimitation of the study.

Research findings suggest that the factors which negatively influence poor HS&E practices in Nigeria’s oil and gas sector include the following: lack of a legal and regulatory framework, ineffective enforcement agency, inadequate training of site workers on HS&E issues, lack of adequate technology to monitor and evaluate HS&E trends and indicators, poor risk assessment management process and poor analysis of the business environment.

Recommendations include purposeful business environmental scanning by multinational oil companies, formulation of an H&S regulatory framework by the Nigerian government, and corporate culture should elucidate the HS&E culture. The oil and gas industry in Nigeria should be made to incorporate an environmental
management system which involves the assessment and control of risks and the creation of an in-built system of maintenance and review. Finally government should develop a strategy for the promotion of peace as the foundation for development within the oil-producing region.
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CHAPTER 1

THE PROBLEM AND ITS SETTING

1.1 Introduction

1.1.1 General overview of the petroleum industry in Nigeria

Since the discovery of vast reserves of petroleum in the 1950s in the Niger Delta region of Nigeria, oil has been an important part of the country’s economy, impacting significantly on both the country’s economic and political life. Nigeria’s oil industry is dominated by the national oil company, the Nigerian National Petroleum Corporation (NNPC) founded in 1977. Crude oil exploration, drilling and shipping are dominated by western MNOCs. Oil production has had severe environmental and human consequences for the indigenous peoples who inhabit the areas surrounding oil extraction (Omeje, 2006). Oil production has not only devastated the local environment, but has destroyed the economic viability of the region for local farmers and producers (Ojakorotu, 2010a). The Federal Government of Nigeria, on the other hand, has been charged with failing to enact and enforce environmental protection against oil companies. Oil production and the lack of adequate regulations on multinational companies have left indigenous communities further compromised due to environmental degradation (Ibeanu, 2000b). There is devastation of the local economy as a result of the socio-economic and environmental disturbances from the oil industry. The social and environmental costs of oil production have been extensive. Wildlife and biodiversity have been destroyed, there has been loss of fertile soil and of clean air, and drinking water has been polluted. Furthermore, degradation of farmland and damage to aquatic ecosystems have occurred (Ojakorotu and Okeke-Uzodike, 2006). All of the above have caused serious health problems for the inhabitants of areas surrounding oil production. Contributing to this, is pollution caused by gas flaring, above ground pipeline leakage, oil waste dumping, and oil spills. According to a World Bank Report, approximately 75% of gas produced in Nigeria is flared annually, making Nigeria one of the highest gas flaring nations in the world (Garner, Svensson, and Djumena, 2004). The flared gas causes considerable ecological and physical damage to other resources such as land / soil, water and
vegetation. Gas flares, which are often situated close to villages, produce soot, which is deposited on the roofs of buildings in neighbouring villages. The soot is washed off during rainfall and the black ink-like water running from the roofs is believed to contain chemicals, which adversely affect the fertility of the soil. Gas pipelines have also caused irreparable damage to lands once used for agricultural purposes as they are often laid above ground and run directly through villages, where oil leaks have rendered the land economically useless (Ibeanu, 2000a).

Oil spills and dumping oil into waterways have been extensive, often poisoning drinking water and destroying vegetation. According to the United Nations Development Programme, more than 400 000 tonnes of oil has spilled into creeks and terrains of the Niger Delta in the past 30 years (Wilde-Ramsing, 2008).

Oil companies are also being accused of engaging in widespread ecological disturbances, including explosions from seismic surveys, pollution from pipe-line leaks, blowouts, drilling fluids and refinery effluents, and land alienation and disruption of the natural terrain from construction of industry infrastructure and in the surrounding areas making them "unsuitable for plant growth by reducing the availability of nutrients or by increasing toxic contents in the soil." Gas flaring; on the other hand, has been associated with reduced crop yield and plant growth on nearby farms, and disruption of wildlife in the immediate vicinity. Indiscriminate dumping is the oil company’s way of easily and inexpensively dealing with by-products from oil drilling. Nigeria has been the world's largest gas flarer for years. It has caused more greenhouse gas emissions than all other sources in Sub-Saharan Africa combined, according to environmental groups.

The conflict over unfriendly environmental practices by the oil and gas industry has ravaged the Niger Delta region of Nigeria for decades. The oil rich Niger delta region of Nigeria has been embroiled in a crisis between MNOCs and host communities, government forces and some militant elements that are aggrieved over certain fundamental issues affecting the region over the past couple of years, issues which, inter alia, have contributed to the escalation of militia groups. Militants have fought with government forces, sabotaged oil installations, attacked oil and gas facilities, and taken foreign / local oil and construction workers hostage. At the root of the problem is a crisis of underdevelopment and poverty despite massive oil deposits. The crisis
has been exacerbated by emergent issues of a gross distortion of Nigerian federalism in respect to resource control, citizenship rights and environmental degradation. Unfortunately, the external manifestation has been mainly that of violent agitations and criminal activities of some elements taking advantage of the bad situation. Ojakorotu (2000b) asserts that the region became a breeding ground of violent socio-political and economic protests as a consequence of the degradation of the environment owing to oil exploration and the state’s failure and inability to properly address the resulting challenges. Also at the forefront of the conflict is the adverse poverty of the people, a paradoxical situation for a people whose land produces 2% of world oil reserves and accounts for over 80% of Nigeria’s foreign revenue (Ojakorotu, 2010a citing the World Bank, 2002). Echefu and Akpofure (2007) explain that the existence of uncertainty in the oil sector is as a result of multiple regulators, with similar and identical responsibilities making the process of monitoring, enforcement and ensuring compliance difficult. The recurrent kidnapping of workers by rebel groups in Nigeria has put the country at the forefront of media attention, and raised concerns on the issue of health, safety and security of workers, host communities and the general public.

1.1.2 Historical development of the petroleum industry in Nigeria

The Nigerian petroleum industry has attained an appreciable growth rate since the discovery of oil in commercial quantities in Oloibiri Village in Rivers State in 1956 by Shell D’Arcy, a company of Anglo / Dutch origins now called the Shell Petroleum Development Company (SPDC). Production began in 1958 with an average output of 6 000 barrels of oil per day. In the 1960s, government interest in the oil industry was limited to the collection of taxes, royalties, and lease rentals (Obi, 1999; Olojede Fajonyomi, Akhape, and Mudashiru, 2000). This began changing when on 14 December 1962 a majority of the General Assembly of the United Nations adopted Resolution 1803 (XVII) on ‘Permanent Sovereignty over Natural Resources’, which asserts that the right of people to freely use and exploit their natural wealth and resources is inherent in their sovereignty. The Nigerian government subsequently enacted the Petroleum Act of 1969.
The SPDC continued to dominate Nigeria’s oil industry for many years until 1971 when Nigeria became a member of the Organisation of Petroleum Exporting Countries (OPEC). Following this, Nigeria began to take firmer control of its oil and gas resources in line with the practice of the other members of OPEC. Nigeria established the NNPC in 1977; the NNPC is the major partner in the upstream ventures with the major multinational petroleum exploration and production companies (NNPC, 2006). The petroleum industry in Nigeria is regulated by the Department of Petroleum Resources (DPR) which ensures compliance with industry regulations, processes applications for licences, leases and permits, and establishes and enforces environmental regulations.

The withdrawal of Shell’s monopoly resulted in the emergence of foreign MNOCs from the Western world and other parts (Peel, 2010). Operating under Joint Operating Agreements (JOAs), which clearly specified the respective stakes of the companies and the Government of Nigeria, in the ventures, other MNOCs such as Texaco (now Chevron Texaco), Elf Petroleum (now TotalFinaElf), Mobil (now ExxonMobil) and National Agip Oil Company (AGIP) arrived on the scene. To date, these MNOCs constitute the major players in Nigeria’s oil industry. In 1991 the Government conducted a licensing round and offered 137 oil acreages for open, international competitive bidding in which the acreage which was relinquished by the MNOCs for reasons such as low oil reserves and unwillingness to develop concessions, was given to indigenous oil prospectors. The MNOCs account for about 97% of Nigeria’s oil reserves and production.

According to Peel (2010), Nigeria’s trade, commerce and global association is influenced by the oil dominated economy. Nigeria has 15 oil depots scattered all over the country and four refineries. The Kaduna Refinery and Petro-chemicals built in 1988 has a processing capacity of 110,000 barrels per day. The Port-Harcourt Refineries I and II in the form of the old refinery built in 1964 by SPDC which has a processing capacity of 60,000 barrels per day and the new refinery built in 1978 which has a processing capacity of 210,000 barrels per day. Then the Warri Refinery and Petro-Chemicals built in 1978, which has a processing capacity of 125,000 barrels per day. All the refineries produce the normal range of products; these include liquefied petroleum gas (LPG), premium motor spirit (PMS), dual purpose kerosene
(DPK), aviation turbine kerosene (ATK), and automatic gas oil (AGO). In addition the Kaduna Plant produces lubricating oils, base stocks for petroleum plants, bitumen, and waxes. In 1991 the estimated proven reserves of crude oil in Sub-Saharan Africa amounted to 21.7 billion barrels or 2.2% of world reserves, 79% of which is located in Nigeria. Nigeria is regarded as mainly a gas province with some oil (Kupolokun, 2006).

The emergence of offshore oil and gas operations and the granting of deep water acreages to oil producing companies bear witness to a shift from JOA regimes to Production Sharing Contracts (PSCs), with implications for the operation and regulation of the oil industry in Nigeria. The JOA operates as a form of partnership between joint venture (JV) partners, which spells out the participatory interest of each of the partners and also designates one of the partners as the operator of the venture. The PSCs on the other hand focus on the sharing of output of oil and gas operations in agreed proportions between the oil company, as a contractor to the government, and the NNPC as a representative of government interest in the venture. Some MNOCs have formed into indigenous oil companies’ concessions where they provide the technical expertise and funding required for exploration and production operations.

1.1.3 Current state of the petroleum industry in Nigeria

Peel (2010) claims that Nigeria has become a guinea pig for a fossil-fuel-obsessed world, and is self-inflicting its woes as a result of an oil-dominated economy. He reports that the global clamour for Nigeria’s oil is evident, since Nigeria accounts for 10% of total imports of oil to the United States of America (USA). Furthermore China in the past decade has captured exploration contracts with promises of investment in infrastructure, Russia is in a joint venture with the NNPC, and the European Union (EU) has offered financial and political assistance to the country in return for the direct export of its gas to Europe.

Nigeria stands as the largest exporter of crude oil in Africa when in full production, and is amongst the top ten in the world (Peel, 2010). Nigeria is of strategic value to the MNOCs and their home countries, due to the magnitude and quality of its crude oil and gas reserves, its physical location as it is geographically closer to the USA than the Middle East, and its conciliatory government. The high quality of Nigeria’s
crude oil makes refining it into petroleum very easy. Furthermore, its enormous and incessantly expanding gas reserves are having a significant impact on the global move towards gas (Peel, 2010).

Of the 606 oil fields in the Niger Delta region of the Nigeria, 355 are located on-shore, and 251 are offshore. Of these, 193 are currently operational while 23 have been shut down or abandoned due to poor productivity or drying up of wells. Outside the Niger Delta region, there are two oil wells in Anambra state, one well each in Edo state and Benue state, while the Chad basin has 24 wells (NNPC, 2006).

A network of about 7 000 kilometres of pipelines and flow lines criss-cross communities and creeks in the country wending their way like submerged snakes of which: 105 kilometres is for condensates; 1 896 kilometres for natural gas; 3 638 kilometres for crude oil, and 3 626 kilometres for refined products (UNDP, 2006). A great deal of the crude oil exploration and production activities is carried out by drilling and transporting it via exposed oil wells and pipelines running through host communities on both land, water ways, and in the creeks transient through-flow stations to export terminals on the coast (Peel, 2010).

Nigeria’s production rate stands at 25.93 billion barrels of oil, 3.80 billion barrels of condensate and 158 trillion cubic feet of gas as at 2000, up from a modest figure of 0.184 billion barrels of oil and 2.260 billion cubic feet of gas in 1958 (NNPC, 2004).

With all its prospects, in the past decade Nigeria has become characterised by oil violence, public protests, riots, and militia activities as a result of actions fuelled by perceived aggression by Government and MNOCs towards host communities. Host communities and militants have undermined oil and gas industry activities, which has resulted in a massive cut in production, which has raised concerns in international circles (Peel, 2010).

From 2003 to 2009 alone, the reduction in the country’s oil production capacity resulted in a tremendous loss in foreign exchange earnings. Nigeria’s oil exports fell from 2.6 million barrels per day in 2006 to 1.6 million by March 2009. Furthermore, the country lost approximately $61.6 billion to oil theft and sabotage between 2006 and 2008, while approximately 300 people, comprising engineers, project managers
and consultants which were mostly foreigners) were kidnapped and taken as hostages (Oladele, 2009).

1.2 The Statement of the problem

The purpose of the study is to investigate the implications of crude oil exploration on the environment and how organisations in the oil and gas sector are addressing industry needs and challenges relative to HS&E / security of workers. Furthermore, to gauge if companies are able to realise optimum H&S standards together with effective business operations and practices.

The following sub-problems have been identified, the addressing of which would contribute to resolving the research problem:

1.3 The sub-problems

1.3.1 Sub-problem 1: Workers encounter difficulty in performing their work
1.3.2 Sub-problem 2: Workers work in an unsafe environment
1.3.3 Sub-problem 3: HS&E practices are not benchmarked to international standards
1.3.4 Sub-problem 4: Poor maintenance of oil pipelines and flow lines
1.3.5 Sub-problem 5: Oil and gas companies have not fully imbibed HS&E culture
1.3.6 Sub-problem 6: HS&E practices are not adequately enforced
1.3.7 Sub-problem 7: HS&E management is not considered relevant during business environmental evaluation
1.3.8 Sub-problem 8: Technology and innovation is not considered relevant to HS&E management
1.3.9 Sub-problem 9: Oil and gas industries in Nigeria do not encourage research and development in HS&E management

1.4 Hypotheses

1.4.1 Hypothesis 1: Poor training / retraining of workers on HS&E devices
1.4.2 Hypothesis 2: There is general insecurity on site
1.4.3 Hypothesis 3: Best operating practice is not integrated into HS&E management
1.4.4 Hypothesis 4: Recurrent incidents of pipelines / flow line blowouts are common
1.4.5 Hypothesis 5: Management does not promote HS&E culture
1.4.6 Hypothesis 6: HS&E inspectorate is ineffective
1.4.7 Hypothesis 7: HS&E management is ignored when conducting business environmental assessments
1.4.8 Hypothesis 8: Technology and innovation are deliberately ignored to reduce costs
1.4.9 Hypothesis 9: New developments in HS&E are not integrated into existing process

1.5 The delimitations of the study
According to Punch (2005), it is necessary to delimit a study to enable proper management and understanding of a research topic. This study will be conducted amongst the MNOCs involved in joint operating agreements and production sharing contracts with the NNPC. The population for the study will be limited to professionals within the production, exploration and HS&E departments of the MNOCs.

1.6 The definition of terms
A hazard: anything that might cause harm, for example chemicals, electricity, and vehicles (HSE, 2006).

Conflict: Conflict refers to contradictions arising from differences in the interests, ideas, ideologies, and orientations of the people concerned. These contradictions are inherent at all levels of social and economic interactions of the human race. They may therefore exist at the individual, group, institutional, regional, national and international levels. Conflict is thus a pervasive phenomenon in human relationships and has been seen as the ‘basic unit for understanding social existence’ (Nnoli, 1998).

Environment: "The physical or natural surroundings made up of the land, water and air, as well as natural resources including plants, animals and minerals that make development possible.” (Udo, 2002)
Health: the protection of the bodies and minds of people from illness resulting from the materials, processes or procedures used in the workplace (Hughes and Ferrett, 2007).

H&S: The effective conservation of human life which ensures that any employee is not exposed to any hazards that will affect his safety and that his action does not affect the safety of colleagues or persons that are in the same environment (Raouf and Dhillon, 1994).

Innovation: the process whereby new and improved products, processes, materials, and services are developed and transferred to a plant and/or market where they are appropriate (Bruton and White, 2011).

Risk: is the potential for realisation of unwanted, negative consequences of an event (Brauer, 2006).

Safety: the protection of people from physical injury. The borderline between health and safety is ill-defined and the two words are normally used together to indicate concern for the physical and mental well-being of the individual at the place of work (Hughes and Ferrett, 2007).

Security: the well-being of humans which includes issues of human concern, such as security from poverty, disease, famine, illiteracy, environmental despoliation and unemployment, which singly or jointly contribute to impairments of human existence (Uzodike and Isike, 2009).

Technology: the practical implementation of learning and knowledge by individuals and organisations to aid human endeavour (Bruton and White, 2011).

Violence is “the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation.” (World Health Organisation, 2002)
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>AGO</td>
<td>Automatic Gas Oil</td>
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<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
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<tr>
<td>ATK</td>
<td>Aviation Turbine Kerosene</td>
</tr>
<tr>
<td>DPK</td>
<td>Dual Purpose Kerosene</td>
</tr>
<tr>
<td>DPR</td>
<td>Department of Petroleum Resources</td>
</tr>
<tr>
<td>EGAS</td>
<td>Environmental Guidelines and Standards</td>
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<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<tr>
<td>EMAS</td>
<td>Eco-Management Audit Scheme</td>
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<tr>
<td>EMS</td>
<td>Environmental Management System</td>
</tr>
<tr>
<td>EPPD</td>
<td>Environmental Planning and Protection Division</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FEPA</td>
<td>Federal Environmental Protection Agency</td>
</tr>
<tr>
<td>FME</td>
<td>Federal Ministry of Environment</td>
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<tr>
<td>GHS</td>
<td>Globally Harmonized System of Classification and Labelling of Chemicals</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>HS&amp;E</td>
<td>Health, Safety and Environment</td>
</tr>
<tr>
<td>H&amp;S</td>
<td>Health and Safety</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
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<tr>
<td>ISO</td>
<td>International Standards Organisation</td>
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<tr>
<td>JOA</td>
<td>Joint Operating Agreement</td>
</tr>
<tr>
<td>JTF</td>
<td>Joint Task Force</td>
</tr>
<tr>
<td>LPG</td>
<td>Liquefied Petroleum Gas</td>
</tr>
<tr>
<td>MEND</td>
<td>Movement for the Emancipation of the Niger Delta</td>
</tr>
<tr>
<td>MNOC</td>
<td>Multinational Oil Company</td>
</tr>
<tr>
<td>MOSOP</td>
<td>Movement for the Survival of the Ogoni People</td>
</tr>
<tr>
<td>MOU</td>
<td>Memorandum of Understanding</td>
</tr>
<tr>
<td>NDPVF</td>
<td>Niger Delta People’s Volunteer Force</td>
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<tr>
<td>NLNG</td>
<td>Nigerian Liquefied Natural Gas</td>
</tr>
<tr>
<td>NNPC</td>
<td>Nigerian National Petroleum Corporation</td>
</tr>
<tr>
<td>NPE</td>
<td>National Policy on the Environment</td>
</tr>
<tr>
<td>OEL</td>
<td>Oil Exploration Licence</td>
</tr>
<tr>
<td>OGIC</td>
<td>Oil and Gas Reform Implementation Committee</td>
</tr>
</tbody>
</table>
1.8 The assumptions

The following assumptions were made with respect to the research problem and sub-problems:

- That multinational oil companies conduct their operations and activities in developing countries using international standards;
- That increased public concerns about environmental disasters and the effect of fossil fuels on global warming, attacks on energy assets and workers have sharpened the industry’s focus on environmental and H&S issues;
- Business environmental assessment is conducted by oil companies to determine potential causes of business turbulence, and
- That HS&E management is an integral aspect of organisational operations.

1.9 The importance of the study

Available literature regarding the Nigerian oil industry is extensive; various studies have dealt with the political, social, and economic aspects of the crisis. The anti-oil protests, conflict between the state and local movements, and the prevalence of violence within the region have also been addressed by Castro (2009), Ross (2004), and Omeje (2004). The environmental impact of oil operations on the local people, one of the major causes of anti-oil protests, has been addressed in a number of academic studies, and by environmental organisations and NGOs. Human Rights Watch has also added its voice to the issue. Some of the oil companies involved have come under
scrutiny and have released reports on ‘their side of the story’. However, there is little literature available regarding the H&S challenges experienced during oil and gas exploration activities and the difficulties experienced by oil companies in conducting business environmental analysis and the incorporation of technology and innovation to improve HS&E management in the sector. This study is a modest attempt at investigating the H&S impact of decades of oil exploration on the ecological and business environment and the oil company staff and companies providing various services to oil companies with a focus on the construction companies responsible for designing and building oil installations and infrastructures.

1.10 Aim of the study
The aim of this study is to investigate the consequences of crude oil exploration relative to HS&E management in Nigeria’s oil industry.

1.11 Objectives of the study
The objectives of the study are to:

- Establish the extent to which the petroleum industry activities contribute to the H&S challenges experienced by stakeholders;
- Establish the causes and impact of oil and gas exploration activities on the environment;
- Establish the impact, if any, of business environmental turbulence on HS&E management;
- Establish the degree of integration of technology and innovation in HS&E practices;
- Establish the degree of prevalence of HS&E culture in the oil and gas industry, and
- Develop a model which focuses on strategic HS&E management.
CHAPTER 2

THEORETICAL FRAMEWORK

2.1 Introduction

This chapter presents the viewpoints that are fundamental to the focus of this research. As a result it presents the concept of previous studies, perceptions and ideas relative to the research project with the purpose of informing the rest of the research. It forms the philosophical basis of the research and the link between the theoretical aspects and practical components of the investigation undertaken (May, 2006). This is the structure that supports the research work and explains the basis of the problem.

The selection of a logical framework is both a clarifying and an exclusionary step in the research process. While it sharpens focus and consequently increases clarity brought to the problem area it assists within the development of a conceptual model to crystallise the relationship between issues that have been identified as significant to the problem under investigation. Therefore, the conceptual structure presents the theory that explains why the problems of the statement exist and the body of knowledge in which the theory can be located.

This chapter discusses the concept of management, highlights the key elements which influence HS&E management, and develops a framework for the study.

2.2 HS&E background

Bamber (2008) asserts that the humanitarian reason for accident prevention is based on the notion that it is the duty of any person to ensure the general well-being of his peers. This then places an onus on an employer to provide a safe and healthy working environment for all employees and the community where the business is conducted.

According to Channing (2008a), the development of HS&E management became imperative after numerous catastrophes and harm to human life in the work place and on sites. Channing (2008a) posits that traditionally injuries were blamed on operator failure. Later calamities were widely viewed in technological terms. In recent times both operator and technology failures are perceived as demonstrations of management failure.
As far back as the 1960s researchers have alerted the world to the hazards posed by the chemical industry. The oil shocks of the 1970s drove home the dependence of industrialized economies upon oil. The 1980s were earmarked by a number of serious environmental and social incidents involving businesses, some of which include the American oil tanker Exxon-Valdez which collided with the Bligh Reef causing a major oil spillage in Alaska’s Prince William Sound, the explosion on the oil and gas production platform Piper Alpha, in the North Sea, near Aberdeen, the lethal explosion at the Union carbide chemical plant in Bhopal (Peattie, 2008).

Recently, 20 April, 2010 to be precise, the British Petroleum (BP) oil spill which occurred in the Gulf of Mexico was cited the worst in the history of the USA. Scientists estimated that approximately 40 000 barrels of oil spilled daily, the oil moved along the coast line polluting the coast of Alabama, Mississippi, Louisiana and Florida. Secondly, following a major earthquake, a 15-metre tsunami disabled the power supply and cooling of three Fukushima Daiichi reactors, in Japan, causing a nuclear accident on 11 March 2011.

Scientific discoveries also demonstrated the impact of industrialisation through the discovery of a hole in the ozone layer caused by chlorofluorocarbons (CFCs), the increasing levels of pesticides found within food and water supplies and the growing evidence of global warming caused by greenhouse gases (GHGs). These factors combine to create widespread public, media and political concerns relative to the health and safety (H&S) of the products and production technologies that organisations employed and the responsibility of the managers behind them.

The concept of social and civic responsibility of organisations and their people recognizes that conditions beyond the immediate domain of one’s particular organisation are important and merit attention and care. Assuming those responsibilities may also foster the development of mechanisms to meet the challenges of local communities as well as the environment. The environment undeniably has an enormous impact on human health and well-being. The health of the planet's natural resources will continue to be vital to the livelihood of all of earth's living things. Therefore, it has become imperative to safeguard the natural resources
as well as to implement environmental protections that will ensure that plants, animals, and humans are assured a sustainable future.

Beginning from the early 1980s, environmental and social issues became part of the strategic agenda of an extensive range of industries. Traditionally, these were exclusive rights of the automotive, chemical and oil industries, coupled with social responsibilities centred on generating wealth, respecting laws and regulations regarding contracts, employment and H&S.

The overall aim of HS&E management is to ensure that risks to the H&S of workers, the general public and the preservation of the environment are properly controlled. This results in the effective management of HS&E, which is vital to employee well-being, contributes to enhancing business reputation, help business achieve high performance teams and cost benefits. This assertion is supported by Erickson (2011) whose research findings suggest that treatment of employees was the most predictive factor of H&S performance.

Relative to corporate responsibility, HS&E management ensures that management systems are improved to reduce injuries and ill health, demonstrate the importance of HS&E issues at top-management level and of monitoring HS&E issues within the organisation while reviewing performance against targets. This has led to a better understanding of overall requirements for employee well-being in the workplace, while managing projects and the responsibility of the organisations to the general public and the environment.

The overall benefits of these processes have over the years ensured the development of high HS&E standards within the global business environments. HS&E management is relevant to all sectors of business, corporate and commerce including traditional industries, information technology companies, health service, social welfare homes, schools, tertiary institutions, recreational facilities and workplaces (Hughes and Ferret, 2007).
2.3 Management

There is more to an organisation than its chart. Organisations are made up of people and managing people is a key challenge of contemporary organisational life. Management of human resources entails an inherent debate regarding the worth of people in the organisation and how they should be managed. However, effective human resource management is important to the successful achievement of an organisation’s strategy. In the twenty-first century, management will be contingent on its basics such as leadership, organisation and process.

The many books and writings on management provide countless definitions of management and what is involved in it. Hellriegel, Jackson and Slocum (2005), Brauer (2006) and Dessler (2004) are of the opinion that management involves the planning, organizing, leading, selecting and placement of employees, training and development of subordinates, accountability, and responsibility. Management has traditionally been described in terms of process and the four basic activities that make up the management process are shown in Figure 1.1 below.

**Figure 1.1: Basic managerial functions**

![Diagram showing the four basic activities of management: Planning, Organizing, Leading, Controlling]

Source: Hellriegel et al. (2005)

This process is achieved through co-ordinating and controlling organisational tasks and activities to achieve the aims and objectives of the organisation. Hence it involves the act of getting things done using people and resources (Rees and Porter, 2001).

As shown in Figure 1.1 above, they are portrayed as sequential and iterative. Management begins with planning which sets the strategies, objectives and goals for
an organisation. Planning drives the organisation and other management activities are intended to achieve plans. Following planning is organising, which provides structure to ensure that plans can be realised. Leading ensures that workers behave in desirable ways that lead to achieving plans. Controlling is designed to measure progress towards plans and allow for corrective action. A fifth function, namely staffing is added by some researchers, and it involves the process of identifying and positioning people who will carry out the necessary function to achieve plans.

These show that management is an administrative function which emphasizes taking charge, regulating affairs, decision making, problem solving and securing outcomes. In other words, most of the work of management is orchestrated by a standing agenda that permits monitoring the state of the business. It requires leadership, authority and effective co-ordinating of resources in pursuit of organisational goals. However, its bottom line is making a profit from producing or providing goods or services, respectively.

### 2.3.1 Management style

Undeniably, in the forefront of challenges facing management in the 21st century is the pursuit of sustainable development and the requirement to make societies, economies and systems of consumption and production more environmentally, socially and economically sustainable. Concern about the social and environmental impacts of business activities is intense (Peattie, 2008).

With the benefits of growth that is not sustainable being called into question, and with demands for businesses to address the needs of a wider group of stakeholders and to adopt a broader range of social responsibilities, managers are having to change to respond to shifts in the priorities and expectations of society.

The archetypal task of managers in an organisation is to institute and implement the utilisation of policies, procedures, and methods that reduce uncertainty in organisational outputs and outcomes. People approach the task of management differently. While some are very authoritative, directing virtually every action of their employees, others encourage subordinates to participate in decision making and setting the climate for getting the job done.
According to Verma (2010), management style is the conventional method top management adopts to perform the range of functions in an organisation. This entails the approach management uses to accomplish tasks such as goal setting, strategy formulation, staffing, coordinating, monitoring, directing, image building and environmental management.

It is necessary to note at this point that management responsibility does not stop with operational management. The continuing survival of an organisation requires both operational management for the purpose of seeking near-term efficiency and strategic management for the desirable change necessary for survival. Management teams are responsible for seeking ways of making their commitment to positive and useful change visible to all concerned.

Once the need for change is identified, effective communication of the beliefs which underlie the change through their individual behaviour and management practices is required. This ensures that the whole organisation shares the management perceptions and beliefs about the importance of change and the need to achieve the policy objectives. The management style employed in an organisation and for the execution of projects will therefore, have a great effect on the productivity outcome, seeing that the systems, processes, plant and equipment used during project execution are operated by human beings.

Adequate supervision is necessary to ensure workers are motivated to meet scheduled targets. Many organisations understand that good management requires senior managers to spend time with front line workers. This is encouraged throughout the organisation. Managers must be courageous and capable of taking decisions. They must be able to take calculated risks and look ahead. However, since no one is born a manager or an administrator, people must acquire the skills to excel in managerial positions. No man is an island either; hence most projects take the collective effort of people to succeed. Team work is a very important aspect of management.

Teams should be built around every project and team members should be adequately engaged in all project activities. They should be encouraged to contribute and make
suggestions on process and execution methods. However, generally the nature of humans is to tend towards not wanting to work; they need to be coerced to work. Hence managers require effective leadership skills to adequately supervise and coerce workers to meet scheduled targets and to influence subordinates.

The following factors could be used in assessing the management style of persons in positions of authority, according to Dubrin (2010):

- Setting specific goals which employees are to accomplish;
- Setting project goals for project team;
- Organising the work environment for employees;
- Setting timelines for tasks and projects;
- Giving directions and supervision;
- Evaluating progress;
- Providing motivation and encouragement;
- Involving team members through discussion of work;
- Encouraging feedback from workers, and
- Seeking people’s opinions and concerns and providing a general synergy of activities.

2.4 The framework for HS&E management

Most of the key elements required for effective HS&E management are very similar to those required for good quality, finances and general business management practices. Successful organisations usually have good HS&E management policy in place. The principle of good and effective management provides a sound basis for the improvement of HS&E performance. HS&E management is concerned with organisational structures, the climate for change within an organisation and individual roles within the organisation (HSE, 2000). Contemporary organisations appreciate the value of their human capital. Therefore, if people are able to work in a harmless environment and employees find their work stimulating, this will encourage job satisfaction and could help improve employee health and well-being (HSE, 2000).

An aspect of an organisation’s corporate responsibility includes the ways in which organisations manage their core business to add social, environmental and economic
value in order to produce a positive, sustainable impact on both society and the business itself. Organisations that effectively manage HS&E are aware of the correlation between the assessment and control of risks, general health and the very core of the business itself (HSE, 2000). Management’s approach to HS&E may vary either by ensuring compliance with what the law says, considering the human resources aspects, or economic aspects, since all accidents and ill health cost money.

Ultimately it rests on management to identify those organisational attributes which influence H&S behaviour by creating a positive climate in which HS&E is seen by both management and employees as being fundamental to the organisation’s day-to-day operations. This can happen through ensuring that the policies and systems which are devised for the control of the organisation’s operations take proper account of human capabilities and fallibilities. This can be achieved through leadership which engenders an environment that encourages H&S based behaviour. It is not enough for senior management to trust but they must verify that workers are doing the right thing.

When senior management demonstrates through active involvement they are able to galvanise managers throughout the organisation into action, this can be achieved by committing to the achievement of progressively higher standards of HS&E management. This is shown at the top of the organisation and cascades through successive levels of the organisation (Holt, 2005). Channing (2008b) agrees with this theory, hence, they postulate that a high level of HS&E on the workplace floor will not influence attitudes in the boardroom.

It is almost unknown for reverse flow to occur; it has to be from top down through the organisation so that it becomes part of the culture and this is overtly accepted by making HS&E a line management responsibility (Holt, 2005). The approach needs to commence at top management level, through a visible and spirited support. Strong leadership and commitment and engagement of senior / line managers are fundamental to the success of HS&E management (HSE, 2000), because all employees from management staff down have HS&E responsibilities (Holt, 2005). This will explain why the Health and Safety Commission produced guidance for directors containing five action points, which Hughes et al. (2007) and Channing (2008b) report to include:
• The boards formal and visible acceptance of its collective role in providing HS&E leadership in an organisation;
• Each board member needs to accept their individual role in providing HS&E leadership for the organisation;
• All board decisions must reflect HS&E intentions, as articulated in the organisations HS&E policy statement;
• The board needs to recognise its role in engaging the active participation of workers in improving HS&E, and
• The board should ensure that it is kept informed of and alert to, relevant HS&E risk management issues.

Furthermore, the Commission recommends that the board appoints one of their members to act as the director of HS&E.

A successful HS&E management system should be integrated into a higher-level total quality management system governing overall operations. This connection is imperative to ensure top-down dedication and to identify the principle and vision essential to enable HS&E to be managed as an integral part of an organisation’s policy.

In the early 1980s, there was increasing interest in the management and control of oil and gas industry operations. This shift focused on worldwide attention to quality by the industry with emphasis shifting from traditional quality management control of the end product, to quality assurance. This shift concentrated effort on ensuring good processes that produce the desired final quality. Concepts such as quality management and total quality management were introduced. This reflected in regulations and implementation processes through clear specifications, policy, organising, measurement performance, reviewing performance and requirements relating to line-manager / supervisor responsibility for HS&E management.

Hughes et al. (2007) indicate that the general duties of employers as stipulated in the British Health and Safety Work Act inter alia, include:

• Ensuring the health, safety and welfare of employees of all categories in the workplace including, service providers and temporary employees;
• Ensuring the health, safety and welfare of all visitors to the workplace;
• Ensuring the health, safety and welfare of all persons permitted to use the organisation’s equipment;
• Ensure the health, safety and welfare of those affected directly or indirectly by the work activity, such as host communities and the general public, and
• Ensure the provision of a safe environment for workers, the general public and communities where projects are executed.

When stakeholders and operators share a common principle and a vision for HS&E, and where comparable management systems have been adopted, there will be a greater willingness to work together towards common goals.

2.4.1 Key elements of effective HS&E management

The HSE (2000) considers that effective HS&E management is not just critical to employee well-being, but also plays a crucial role in giving businesses a human face while facilitating the achievement of high-performance in groups. With accusations of unwholesome environmental management practices levelled against oil and gas companies in Nigeria, it is imperative for oil companies to place emphasis on achieving excellence in HS&E management. It has become imperative for managers to establish and develop effective HS&E management systems to address challenges faced in existing policies.

According to the HSE (2000), a key outcome of successful HS&E management is that HS&E performance meets both organisational and statutory requirements and demonstrates commitment to continuous improvement. Efforts to improve HS&E should not be viewed in isolation from each other. A good balance must be maintained between independent responsibility of each person in HS&E work and the responsibility of the organisation to provide good working conditions. Figure 1.2 depicts the elements of successful HS&E management.
Organisations must realise that even with HS&E extensively integrated into organisations in the form of HS&E policies, procedures, and training, HS&E experts, and managers at all levels endorsing HS&E, it is the manner in which HS&E is promoted to employees, which will significantly influence their performance.

Organisational management and leadership style strongly influence HS&E on the job. According to the HSE (2000), effective HS&E management ensures elimination of illness and injuries related to work, proper managing of medical care, a healthy workforce, optimising of business performance, meeting legal requirements, and enhanced profitability.

Source: HSE (2000)
2.4.1.1 Policy

The HSE (2000) indicates that the policy represents the strategic document reflecting clearly the HS&E standards and aims, which are not measurable, the objectives, which are measurable and monitoring and review processes needed to address and reduce the risks of HS&E produced by the organisation.

It is designed in such a way that responsibilities to people and the environment are met in ways which fulfil the spirit and letter of the law (Hughes and Ferrett, 2007). Stakeholders’ expectations in project activities are met and satisfied. It must be simple, concise and communicated to all relevant parties. Effective policies according to the HSE (2000) should be a genuine commitment to action.

Successful HS&E policies set an unambiguous route for organisations to follow, and the policy should contribute to all areas of business performance and be part of the organisation’s core policy. It provides for the setting of HS&E performance targets as part of a display of dedication to continuous improvement and development (HSE, 2000).

This indicates that management is committed to improve HS&E performance while helping to motivate the workforce with tangible goals resulting, possibly, in reward packages and offers evidence during the monitoring, review and audit phases of the management system (Hughes et al., 2007).

The targets should define realistic objectives which relate to employees, service providers, and employee’s families on location, host communities and the general public. They should reflect overall objectives, vision, and the benchmark, framework and philosophies upon which the organisation bases its action.

It should be a policy statement of high expectations which conveys a sense of optimism about what is possible. The design should meet and exceed relevant regulatory or legislative requirements, codes of practice and HS&E standards for continuous improved performance. The policy should address H&S, welfare and relevant environmental issues, duties towards the wider general public and others such
as contractors, service providers, customers, and host communities (Hughes et al., 2007; HSE, 2000).

This should result in a high standard of compliance with environmental and physical requirements; carefully designed and observed safe systems of work, high standards of cleanliness and housekeeping, maintenance of safe means of access and egress, control of toxic, corrosive and flammable substances, where such control is relevant; effective consultation for safety and positive participation by workers, with well-developed training programmes which will be run on a continuing basis for all levels.

2.4.1.2 Organising
According to the HSE (2000), the successful management of HS&E is a line-management responsibility with active participation at all employee levels under line supervision. Therefore, the organisation management structure in place should be suitable for delivering the HS&E policy. It must clearly and explicitly define the responsibilities, authorities and accountability of the personnel within the organisation, as well as how policy implementation is to be monitored and how HS&E committees and representatives are to function.

Organising for HS&E includes a plan which ensures that the required competent and appropriate resources are in place to control, implement, monitor, and review the HS&E programme. It must ensure appropriate corrective action is taken, properly reported and documented for all cases of non-compliance, procedures to ensure that service providers operate an HS&E management system consistent with stipulated guidelines and standards, a system to ensure that accurate, consistent and verifiable HS&E is generated, documented and reviewed, and a programme to ensure appropriate HS&E training, education and mode of promotion (Hughes et al., 2007; HSE, 2000).

All of which is sustained by adequate information dissemination and communication, while encouraging adeptness through the provision of a favourable environment for all workers and their representatives to make a responsible and informed contribution to the HS&E effort (HSE, 2000).
2.4.1.3 Planning and implementing
As a part of a feasibility study, prior to the commencement of operations, a full assessment of HS&E risk is performed. This will involve having a practical arrangement and logical approach to implementing the HS&E policy in place. The planning process is focused on elimination of / minimising of risk. It is imperative for organisations to conduct risk assessment to facilitate the development of control measures (Holt, 2005).

The process includes procedures for eliminating potential hazards from sites, facilities, plant, machinery, substances and working practices through the design and operation of safe systems of work and other forms of hazards control (Hughes et al., 2007), thus ensuring risk is eradicated through selection and design of facilities, equipment and processes or can be minimised by use of physical controls or as a last resort through systems of works and personal protective equipment (HSE, 2000).

The International Association of Oil and Gas Producers (OGP, 2000) suggests that the following strategies are necessary for achieving HS&E objectives and performance criteria:

- An unambiguous description of the objectives;
- Delegation of task for setting and achieving HS&E objectives and performance criteria at each relevant function and level of the organisation;
- The approach through which these objectives and performance criteria are to be achieved;
- Resource requirements;
- Time scales for implementation;
- Programmes for motivating and encouraging a healthy life style and safe behaviour;
- Mechanisms to provide feedback to workers on HS&E performance;
- Performance standards used to measure good personal and HS&E team performance, and
- Mechanisms for monitoring, evaluation and follow up.
According to the OGP (2000), line management is responsible for motivating and empowering workers to work in a healthy and safe manner and to protect their long term health to ensure that workers take reasonable care for the HS&E of themselves and of others who may be affected by their acts or omissions at work and not just avoid accidents. Hence management is also responsible for ensuring that HS&E programmes are implemented according to the planning process. They should monitor, inter alia, issues such as the number of HS&E inspections and audits, frequency of occupational illness, emergency procedures, use of personal protective equipment, number of HS&E risk assessments conducted, and number of HS&E related training courses.

### 2.4.1.4 Measuring / reviewing performance

Conducting performance measures / reviews against a series of specific and attainable standards reveals when and where improvement is required within the HS&E policy and processes (OGP, 2000). This reviews hardware such as premises, plant and substances, and software such as people, procedures and systems, workers’ behaviour and performance and should be conducted on a regular basis.

The HSE (2000) asserts that the objective of active and reactive monitoring should include to establish the remote and immediate cause of below par performance and to spot the fundamental causes and the implications for the design and operation of the HS&E management system.

Holt (2005) suggests that it is significant for organisations to measure HS&E performance as it enables management to:

- Discover the underlying factors involved in injury and loss;
- Establish a platform for trend comparison;
- Calculate the costs of injuries and fatalities;
- Benchmark organisation performance relative to similar organisations;
- Appraise the achievement of the control programme;
- Assess decisions relative to allocation of resources in a bid to maximise cost;
- Identify areas where systems and processes are not effective;
- Anticipate potential HS&E problems and challenges, and
• Determine the scale of HS&E attained within the organisation.

It is important to note at this point that managing an organisation well does not require measuring the absence of a negative (Bamber, 2008). H&S is positive and observable and therefore measurable. Bamber (2008) posits that relying on the absence of injuries and costs does not necessarily imply that an organisation is doing a good job. In fact, that is a very poor measurement because it could just be happening by luck and this could result in false perceptions whereby an organisation erroneously believes it is operating healthy and safe environment. Unreliable measures of H&S, lost time, injury and incident data, result in a false sense of security that H&S exists in an organisation when it does not. He suggests that it is critical that organisations measure the creation of a healthy workplace and develop methods for safe production of goods and services and not the absence of negative outcomes.

2.4.1.5 Auditing and reviewing performance
The OGP (2000) states that a total audit of the HS&E management system is required to achieve continuous improvement. Hence organisations should conduct a thorough and critical examination of the HS&E management process with the aim of identifying strengths and weaknesses.

This process should be an on-going process aimed at ensuring effective HS&E management and it should include management policy, attitudes, training, features of processes, personal protective needs, emergency procedures, design and production systems, and operations procedures.

Audit protocols and procedures should be established and maintained. Priority should be given to results from previous risk assessments, and procedure for feedback on audit findings to those responsible and a tracking system for verification of the recommended corrective actions must be included. Overall performance can be assessed by internal reference to key performance indicators and best practice (HSE, 2000).
2.4.2 Risk management

Arguably, today more than ever, the oil and gas industry requires a more diverse set of automated, technological and human competences. The increasing demand and race for natural resources is prompting organisations to explore for petroleum in severe, isolated and in some cases inimical locations, where the easiest of logistical tasks can be challenging and expensive.

Most of these workers are involved in various ranges of diverse activities during project delivery processes the consequence of which involves specific risks (Udosen, 2000).

In business and commerce, risk management is used to forecast the effect of certain risky events on the performance of the organisation, develop alternative strategies for regulating these risks and/or their influence on the organisation, and communicate these alternative strategies to the overall resolution framework applied in the organisation (Bamber, 2008).

Bamber (2008) posits that risk is the product of frequency and severity of potential losses. Frequency is the probability of occurrence of an event. Severity is the potential loss when an event occurs. The loss may be expressed in financial terms such as dollar loss, cost to replace loss equipment, cost of downtime or cost to replace facilities, or in human terms such as loss of life, serious injury, and illness. In legal terms loss includes entitlements, litigations and legal responsibility (Brauer, 2006).

A vital process in HS&E management is risk management, which involves the abolition or the act of reducing threat to the barest minimum of the adverse effects of the pure risks to which an organisation is exposed (Bamber, 2008). The aim of risk management can be viewed from two angles: first those things that may happen and secondly, the application of resources to recover completely and quickly from a loss (Brauer, 2006).

2.4.2.1 Risk identification

This process assists in reducing uncertainty in describing factors that contribute to accidents, injuries, illness and death. A hazard and operability (Hazop) study is
conducted and hazards are identified, and organisations are able to determine whether and to what extent effects in one situation apply to another (Brauer, 2006). It comprises gathering facts and data and analysing them to determine what components contribute to a process that produces injury or illness and to establish if data from particular cases can be generated to other situations. However, it is not easy to see how combinations of things and the complexity of operations, equipment and facilities can lead to undesirable events. According to Bamber (2008), it requires training and expertise to see unsafe conditions and foresee unsafe acts. The process of identifying risk requires a continuous and systematic approach since risks change with time. Multiplication of techniques which include physical inspection of the workplace/site, management and worker interaction, H&S audits, task/job H&S analysis, and a study of past accidents can assist in identifying areas of high risks and accident statistics (Bamber, 2008).

2.4.2.2 Risk analysis / assessment

The risk assessment provides a systematic approach for the identification, management and reduction of the risk to an acceptable level. It is a critical step in risk management. If done correctly, it determines the minimum level of preparedness in order to respond effectively. It involves applying qualitative or quantitative techniques to potential risks. Hence risk is analysed and evaluated. It reduces the uncertainties in measuring risk and it usually involves frequency and severity.

According to the HSE (2000), risk analysis and assessment is an aspect of the planning and implementation stage of the HS&E management system. All aspects of an organisation including HS&E management are required to be covered by the risk assessment process. This assessment should include areas such as training, programmes, supervisory arrangements, and maintenance procedures.

It should reveal the significant hazards present and the general control measures that are in place. Risk assessment is a measurable task. Its quality, quantity and the outcomes of doing assessments are measurable through observation and the perceptions of the people doing them (Bamber, 2008).
2.4.2.3 Risk aversion
This involves a conscious commitment and decision on an organisation’s part to avoid completely a particular risk by discontinuing the operation producing the risk and it presupposes that risk has been identified and evaluated.

2.4.2.4 Risk acceptance
This involves creating decision tables or standards for deciding what risks are acceptable for individuals, organisations or the society. What is acceptable may differ for each group.

2.4.2.5 Risk retention
Bamber (2008) posits that relative to risk retention, the risk is retained in the organisation where any consequent loss is financed by the organisation. According to Brauer (2006), two types can be considered namely: risk retention with knowledge, this covers the case where a conscious decision is made to meet any resulting loss from within the organisation’s financial resources. Decisions regarding which risks to retain can only be made once all the risks have been identified and effectively evaluated. The second is risk retention without knowledge, this usually results from lack of knowledge of the existence of a risk or an omission to insure against it, and this often arises because the risks have not been either identified or fully evaluated.

2.4.2.6 Risk transfer
This refers to the legal assignment of the cost of certain potential losses from one party to another. The most common way of affecting such transfer is by insurance. Hence an insurance company undertakes to compensate the insured organisation against losses resulting from the occurrence of an event specified in the insurance policy.

2.4.2.7 Risk reduction
A goal of zero injuries is a challenge, but may not be credible since risk can only be reduced and not completely eradicated (Brauer, 2006; Channing, 2008). In other words, not all accidents are preventable; assenting to this statement does not mean the only other choice is fatalism.
Organisations can design a management system, which will reduce or eliminate all aspects of accidental loss that lead to wastage of an organisation’s assets. It relies on the decline of risk within the organisation by the implementation of a loss control programme whose basic aim is to protect the company’s assets from wastage caused by accidental loss.

2.4.2.8 Administering the process
This is where an organisation decides on its level of standard for its risk management process. It necessitates monitoring and evaluating if reduction is achieved, if frequency and severity actually resulted as projected and if expenditure achieved the benefits that were anticipated. A crucial aspect of this process is selecting methods and technology to be used and tracking items analysed, hazards identified, analysis applied and decisions made.

2.4.3 HS&E in design and planning
The inclusion of HS&E aspects at the design and planning stages of new projects, buildings, plant and processes is vitally important in order to ensure that HS&E is built in (Bamber, 2008). Bamber further suggests that all professionals involved in design and planning should receive adequate training in HS&E so as to ensure that relevant legislative and technical factors appertaining to HS&E are taken into consideration at the earliest and at all stages of project development.

Organisations should ensure that every project undertaken is appraised from an HS&E perspective. No project should proceed until approved by the HS&E department. This will ensure that the necessary guidance and advice is incorporated into the project. Some aspects of the HS&E action plan to be considered during the design stage as postulated by Bamber (2008) include:

- Ensuring the team leader has been briefed on HS&E and has access to information on HS&E;

- Ensure a Hazop-type brainstorming session of key employees associated with the development of the project is held to detect risks and establish control actions;
• Ensure that suitable written H&S systems of work are prepared and communicated to all concerned. Hence the software which will go with the hardware is developed;

• Ensure that all elements of the project comply with relevant statutory and technical standards;

• Ensure that all employees concerned with the project receive necessary HS&E drills and training;

• Ensure that appropriate emergency procedures are developed, and

• Ensure that the project commissioning procedure involves approval by the HS&E adviser / consultant at all stages of the project’s development.

2.4.4 HS&E regulations in Africa

According to Nwagbaraocha (2011), prior to the late 2000s, African countries did not have legislation / regulations on HS&E laws. However, this practice has changed in recent times as countries on the continent are making efforts to strengthen their HS&E regulatory frameworks. Some of the countries include:

• Ghana which has implemented an environmental rating and disclosure scheme that indicates how companies are meeting environmental commitments;

• The Democratic Republic of the Congo’s National Assembly passed environmental legislation that would create a national agency for environmental protection and require mandatory environmental impact statements for certain activities;

• Algeria passed a decree establishing rules and conditions for granting wastewater discharge authorizations, and

• Morocco which reached an agreement that would create an institute to monitor H&S conditions in workplaces.

Nwagbaraocha (2011) reports that the reason for this move can be attributed to pressure to modernize HS&E regulatory frameworks caused by increased foreign investment in the continent, a desire for transparency within African countries, and foreign pressure from Western governments on organisations that operate in Africa.
The flow of enormous investment into Africa from the USA, Europe and Asia is seeing injection of resources into various sectors such as oil and gas, telecommunications, information technology, mining, and infrastructure. For instance the USA, China, Brazil, and India are currently investing or planning sizable investment portfolios in a variety of projects in Nigeria, Ghana, Angola, and South Africa.

Nwagbaraocha (2011) further reports that this combination of private and public investment has led to considerable growth in countries such as Nigeria, the Democratic Republic of the Congo, and Kenya which have experienced an average gross domestic product (GDP) growth of 6 % to 10 % in the past decade.

The quantum of capital flows into Africa from international corporations and foreign governments is attracting attention to HS&E considerations. Concern for basic human rights, workplace H&S, and potential environmental impacts of increased and expanded industrial operations have resulted in a new desire for operational transparency within Africa. In other words, the drive for transparency has also resulted in the need to improve HS&E regulatory frameworks (Nwagbaraocha, 2011).

Nwagbaraocha (2011) further reports that the USA has introduced legislation relative to the activities of American organisations operating outside the shores of the country. Legislation such as the Dodd-Frank Wall Street Reform and Consumer Protection Act signed into law by United States (US) President Obama in July 2010. The Act requires organisations involved in the commercial development of oil, natural gas, or minerals to report annually to the US. Securities and Exchange Commission (SEC) information about payments made to the US, government and foreign governments for such development.

Subsequently, since 2002, French companies have been authorised to include sustainability information for all countries where they operate in an annual report. The annual sustainability report is also required to include information on:

- Measures taken to ensure compliance with applicable environmental legislation;
- Measures taken to improve energy efficiency and the use of renewable energy;
• Conditions of soil, air, and water use, as well as soil discharges having a serious effect on the environment;
• Measures taken to avoid threats to biological balance, nature, and protected animal and plant species;
• Investments made to prevent adverse impacts of operations on the environment;
• Training and other internal environmental management services;
• Steps taken for environmental evaluation or certification;
• Environmental communication to workers, and
• Measures for reducing risk and responding to off-site pollution.

All of this legislation is placing pressure and impacting on improved legislation on HS&E in African countries. These efforts to increase transparency about operations located beyond domestic borders may continue to be a factor as African countries strengthen their HS&E regulatory structures.

2.4.4.1 HS&E legal framework in Nigeria
The Laws governing Nigeria are influenced by several sources some of which include the English law comprising of the common law, the doctrines of equity, the statutes of general application in force in England on January 1, 1900, statutes, and subsidiary legislation on specified matters, international law such as treaties, and customary international laws.

Second is the Nigerian legislation which consists of Ordinances, Acts, Laws, Degrees and Edicts, other sources include customary law and the Nigerian case Law (Judicial precedents), environmental standards and guidelines for the petroleum industry in Nigeria 1991 and the constitution of Nigeria.

Nigerian legislation represents laws enacted by the various tiers of government within the Nigerian federation, including Statutes enacted before 1 October 1954 by the central legislation (Ordinances). After attaining its independence from Great Britain all such ordinances were re-designated as Acts.

Also called Acts are all laws made by the parliament at the Federal level after the country gained independence. During the days of Military rule in Nigeria the Military
government ruled by decrees which are supreme laws of the land, while the Laws made by Military Governors of States or Regions during the military dictatorship were referred to as Edicts. Customary laws were in existence in all the various rural communities of Nigeria. Customary laws originate from moral rules, shaped by ancestral beliefs and now engrained as Jural postulates.

The laws governing the ownership of land, natural resources and the environment in Nigeria are influenced by most of the aforementioned laws. However, the bedrock of Nigeria’s contemporary environmental policy is contained in the 1999 Constitution of the Federal Republic of Nigeria. Pursuant to Section 20 of the Constitution, the state is empowered to protect and improve the environment and safeguard the water, air and land, forest and wildlife of Nigeria.

In the workplace H&S is seemingly a new topic in Nigeria. However, there appears to be some gradual improvement in awareness and practice. H&S programmes were first introduced in Nigeria when the country was under colonial rule. These programmes ensured that occupational health workers were dispatched to industrial plants and other commercial undertakings, including plantations, for monitoring.

Those initial efforts resulted in the continuous education of personnel and the creation of societies for occupational health and safety (OHS) practitioners in Nigeria: physicians, nurses, H&S officers, and hygienists. It also encouraged an increasing demand for the creation of divisions of H&S in the Nigerian government, in health ministries at the state and national levels and the improvement of health systems in the local governments.

These initiatives led to legislation that included the Labour Act of 1974, the Factories Act of 1987, and the Workman’s Compensation Act of 1987. The Factories Act was enacted to make general and special provisions for the H&S and welfare of persons employed in places statutorily defined as factories. With all these developments, Nigeria still has no national agency or authority, policy, established process and procedures, frameworks or guidelines that govern H&S in the country.
According to Hughes and Ferrett (2007), much of the HS&E law originates from Europe. Understandably so, HS&E laws relative to oil and gas activities operating in Nigeria are based on the EU HS&E law. The majority of the MNOCs operating in Nigeria’s oil and gas industry are foreign organisations from Europe and the USA and they import these laws to Nigeria.

Often in an effort to ensure a responsible approach to HS&E issues in the absence of clear or comprehensive HS&E regulations, multinationals impose either the laws of their parent company or some type of internal corporate requirements often without taking into account local conditions and the cultural differences such as risk perceptions and H&S cultures that exist between Nigeria and these countries. This always makes enforcement difficult.

Currently Nigeria has no comprehensive H&S policy which would provide standards or guidelines to be adhered to by industry. What exist today, are pieces of out-dated legislation and regulations as mentioned above. Some laws relative to H&S are embedded within the country’s environmental laws. This is discussed in detail in Chapter Three.

Implementation of environmental laws in Nigeria is undermined by lack of resources and logistics as are always the excuse of most enforcement agencies in the country and more importantly the non-applicability of some of these laws. The inability of these agencies to perform their oversight responsibilities and strictly enforce compliance in their respective sectors is a major concern in the industry.

2.4.4.2 Trends in occupational health and safety
Nwagbaraocha (2011) is of the opinion that OHS safety regulatory frameworks in African countries will continue to improve because of the visibility of poor labour conditions. Strengthening regulations will result in more court cases, punitive damages, and compensation pay-outs as a result of noncompliance.

He indicates that countries in Africa will continue to take the first steps to implement the requirements of the Globally Harmonized System of Classification and Labelling
of Chemicals (GHS) and will likely base their actions on the GHS groundwork already laid by Mauritius, which implemented the first edition of the GHS in 2004.

In 2011, Kenya took initial steps to implement a national chemical risk management programme that requires a facility using, handling, or producing a chemical to have a recent material safety data sheet (MSDS) and to conduct a chemical risk analysis. In Zambia, the 2010 OHS Bill was introduced. This bill introduced the requirement of H&S committees, and other general H&S requirements, such as the regular medical surveillance of employees.

2.4.5 Perceptions relative to HS&E

A paradigm shift began in the past decade on the traditional methods applied in project management which were based on parameters such as cost, time and quality to include H&S (Smallwood and Haupt, 2005). This shift became necessary as a result of the failure of the traditional approach (Smallwood, 2004).

Smallwood (2004) report that H&S was discovered to be the least important among five project parameters of project quality, public H&S, time and costs in a research study conducted. Smallwood and Haupt (2005) further indicat that some of the benefits which result from adding H&S as part of the traditional parameters include, *inter alia*, positive impact on project time and budget, reduced absenteeism, increased efficiency and lower compensation insurance costs. Therefore, H&S awareness as part of the project parameters will result in a positive effect on project performance.

Subsequently, Lu and Yang (2010) conducted a study among five major container terminal companies in Taiwan. The results indicated that when workers are motivated, they will imbibe HS&E awareness which results in positive HS&E performance which in turn affects HS&E compliance / involvement. Geldart, Smith, Shannon, and Lohfeld (2010) in a cross-sectional study on occupational H&S on workers in Canada showed that administrative policies, practices and attitudes have a direct positive impact on HS&E management in the workplace.

The general idea is perceived as a process which is dependent upon continual feedback from evaluations, assessments, and audits. According to HSE (2000)
successful organisations usually have an excellent HS&E management policy in place. Therefore, the principles of good and effective management provide a sound basis for the improvement of HS&E performance. Thus, if people find their work stimulating and are able to work in a harmless environment, this will encourage a thriving workforce, job satisfaction, improved productivity and could help improve employee H&S (HSE, 2000).

Unfortunately, the reality is that despite men’s best efforts HS&E challenges are still prevalent. Johnson (2004) indicates that there is no magic formula which can be used to ensure successful HS&E management. However, remarkable statistics, backed by proficient, thorough record keeping are very significant. Furthermore, the following vital elements and components of a management system, *inter alia*, can be used to achieve excellence in HS&E practice:

- Senior management engagement;
- Aggressive goals and objectives;
- HS&E professionals who motivate, coach, persuade, influence and market HS&E practice;
- Competent and motivated line managers, supervisors and employees active in training, auditing and problem-solving;
- High percentage of employees who perceive that management is committed to HS&E management;
- Low occupational illness rates;
- Service providers must be held to the same standards as organisation;
- HS&E must be genuinely implanted into corporate culture, and
- A resilient but malleable infrastructure.

DeJoy (2005) further suggests that for management to demonstrate commitment to HS&E issues, it is imperative that they ensure the following practices: HS&E matters are given high priority in organisation meetings and planning activities; free flow of communication between workers and management on HS&E related concerns; HS&E professionals must be strategically positioned within organisation hierarchy; emphasis should be placed on HS&E inspections and control; good housekeeping; training and retraining of workers at all levels, and a clear and positive campaign for HS&E awareness within the organisation.
In line with these practices, Johnson further suggests that tasks, activities, goals and responsibilities must be planned and assigned. The necessary actions must be taken to ensure that the desired objectives are achieved. Teams, groups, and individuals must be monitored, assessed, and an audit conducted to track and document performance, programmes, and progress. Finally, from lessons learned, the processes can be fine-tuned, necessary changes made and new plans can be developed and the process can be repeated. This demonstrates commitment to continuous improvement. The best-practised systems must be sustainable and impervious to personnel changeover. These accepted procedures bring HS&E issues and activities in sync with overall business goals and values.

2.5 Previous studies


From the aforementioned it is evident that a huge amount of research has been conducted in this area, but the missing gap is the overlapping HS&E challenges evident from the various documented studies on decades of environmental
exploitation and degradation. From the aforementioned the premise of this study was established.

2.6 Conclusions
This chapter has presented the underpinning concepts of HS&E management. The argument of the connections between the variables of the research illuminates the practical issues associated with key elements of HS&E management, some of which include risk management, HS&E framework, and standards / regulations.

The discussion indicates that central to H&S management is the lack of a legal framework for workplace H&S, whereas the challenge with enforcing environmental regulations may be due to a lack of enforcement capability and institutional capacity to effectively administer the regulations.

As mentioned previously in many developing countries the regulatory mechanisms in place are modelled on earlier established approaches in developed countries. Hence, Nigeria has the privilege of lessons learned from other nations and formulating policy which best fits its society and business environment.

Previous studies have highlighted the various aspects of the oil crisis which engulfed Nigeria in the past decade, some of which are centred on political, economic, and socio-cultural factors.
CHAPTER 3
THE LITERATURE REVIEW

3.1 Introduction

Nigeria’s economy has remained oil based since the early 1970s, despite the abundance of wealth and economic growth oil has brought to the country. It has paradoxically been a catalyst for economic development on the one hand and a source of tension, an initiator of social segregation, cause of conflict, and strife, environment dilapidation, injury, and loss of human lives. This situation has not been echoed in the past decade elsewhere as much as in the nation’s oil industry. This has drawn a lot of attention to the activities of oil exploration, and production organisations operating in the country, the majority of which are MNOCs.

This attention is centered on alleged unfriendly environmental practices, human rights abuse and violations of H&S standards. The result is a severe scrutiny of decades of oil and gas operations in the country by various stakeholders.

Both the Nigerian government and the MNOCs have been accused of unwholesome practices in relation to operations in the country’s petroleum industry. Media reports have indicated that the escalation of the oil and gas crisis in Nigeria is influenced by social, cultural, economic and political factors.

The main focus of this chapter is to review the relevant literature relative to the study area with a view to assessing the impact of the industry’s business environment, technology and innovation, H&S management, security and how the economic, socio-cultural and political environment impacts on the conflict within the industry.

3.2 Business environment impact

The term business environment connotes external forces, factors and institutions that are beyond the control of the organisation and they affect the functioning of a business enterprise.

These include customers, competitors, suppliers, government, and various social, political, legal, and technological factors (Thompson, Peteraf, Strickland and Gamble,
2012; Hellriegel, Jackson and Slocum 2005). While some of these factors or forces may have a direct influence over the organisation, others may operate indirectly.

There is a close and continuous interaction between the business and its environment. This interaction helps in strengthening the business organisation and using its resources more effectively. As previously mentioned the business environment is multifaceted, complex, and dynamic in nature and has a far-reaching impact on the survival and growth of the organisation. To be more specific, a proper understanding of the social, political, legal and economic environment helps an organisation in determining opportunities and threats, giving direction for growth, continuous learning, image building, meeting competition, and identifying the organisation’s strength, weaknesses, and threats (Thompson et al., 2012).

Developing countries in Africa are continually characterised by a lack of access to basic requirements of life such as health services, potable clean water and education, and the prevalent poverty and high rate of unemployment especially amongst the youth (Krause, 2004). Krause (2004) concludes that they are also affected by major diseases, armed conflict and civil wars. Infrastructure, institutional and human resources development remain weak, commodity export earnings remain unstable and debt burdens continue to be an obstacle to economic recovery. Most developing countries continue to be highly dependent on foreign exchange earnings on production and exports of a few commodities such as is the case with Nigeria where crude oil exports are the major source of foreign exchange earnings.

Factors such as lack of growth, political instability, poor technological / technical development, bad governance; and poor quality of products remain, inter alia, some of the major reasons why developing countries do not have access to favourable market conditions as a result of competition in world trade (Krause, 2004).

There is a desperate need for African countries to develop and sustain strong and effective organisations. An organisation does not exist in a vacuum. It exists in association with its environment, which provides resources and limitations. To remain successful an organisation must continually adapt to its environment (Smit and Cronje, 2002).
Dynamic organisations are relentlessly changing and are encircled by several environmental elements. The approach and strategy an organisation adopts to react to its environment is very crucial to the success of the organisation and could make or break it. Organisations can decide to adjust to the environment or change the environment if it can. However, to remain relevant it is imperative for organisations to reinvent themselves to fit emerging conditions (Thompson, Strickland and Gamble, 2010).

An organisation’s environment, also called the macro environment, includes the external factors that usually affect all or most organisations (Hellriegel et al., 2005). These factors although constantly changing, stand between an organisation’s ability to succeed or fail. Any organisation which fails to adequately adapt to the environment is set for failure because it depends on the external environment for the resources and opportunities necessary for its existence, while the environment determines the limit of the organisation’s activities. However, the limits can sometimes be visible and tangible ones but in other situations may be invisible, but still very real.

For example, social factors in which an organisation exists can specify what kind of behaviour will be tolerated. However environmental factors could also provide opportunities and challenges.

3.2.1 Factors which impact on organisations
It is against this background that Thompson et al. (2012) and Hellriegel, Jackson, Slocum, Staude, Amos, Klopper, Louw and Oosthuizen (2008) suggest ways in which these factors can have profound impacts on organisations.

3.2.1.1 Economic factors
These could be capitalism, socialism or communism and economic / market conditions, expansionary and recessionary cycles and the general standard of living. They include factors which help in understanding how people or nations produce, distribute and consume various goods and services. Major economic issues include taxes paid by organisations and labour, workers’ wages, inflation rate, unemployment, cost of materials used in production process and the prices at which goods and
services are sold, free market competition, private contracts, profit incentives, technological advancement, and organised labour with collective bargaining rights.

Governments are responsible for monitoring businesses, providing directions in monetary policy, fiscal policies, human rights, defence and environmental matters. These include environmental health and safety regulations covering both the workplace and quality of goods produced. They are accountable for the way and manner business operates within the nation, while acting as watch dogs for fair and credible business practices.

3.2.1.2 Political factors
The political environment is concerned with the stability of the government, government bureaucracy, and the effect of political decisions on individuals, organisations and projects. This includes the political system, the government policies and attitude towards the business community and unionism.

All these aspects have a bearing on the strategies adopted by the organisation. The stability of the government influences business and related activities to a great extent. It sends a signal of strength, confidence to various interest groups and investors.

Further, the ideology of the political party also influences the business organisation and its operations. Again the civil society, trade union and pressure groups’ activities also influence the operation of business enterprises. Strikes, lockouts, shutdowns and labour disputes etc. also adversely affect the business and project’s operations.

For instance, the pressures from civil society, host communities, action-groups and armed rebels due to environmental concerns resulting in disruptions in operations, projects, shut-downs, and lockouts have been common occurrences in Nigeria’s oil industry and have had an adverse effect on the industry’s operations.

3.2.1.3 Demographics
This refers to the size, density, distribution and growth rate of the population. All these factors have a direct bearing on the demand for various goods and services. The demands of people who reside in cities and towns are different from those of the
people who live in rural areas. The high rise of population indicates the easy availability of labour. This encourages the organisations to use labour intensive techniques of production. Moreover, availability of skilled labour in certain areas motivates organisations to set up operational bases in such areas.

3.2.1.4 Socio-cultural factors
This refers to the social environment concerns, needs for projects, individuals or communities. This includes values, beliefs, language and religious influences and laws which all affect how organisations operate. A country’s cultural values determine how people interact with one another and with organisations and institutions. This could also influence the choices that consumers make.

Social attitude to work has changed considerably over the past two decades. There has been a tremendous leap from being employed, over worked, working long hours and barely earning enough to survive. However, with the considerable raise in incomes, and living standards, growing concerns about global warming, and how industries are contributing to destroying the atmosphere, and pressure from environmental groups, and non-governmental organisations, radical changes in social behaviour have occurred. Employees are now able to afford an extensive social life; attitudes have been affected as people are conscious of dangers experienced at work.

Employees are now demanding that any dangers from the work process be removed and that employers provide conditions of work that do not put them at risk. Added to this mix are raising concerns about how the organisation’s operations are affecting the environment and hence communities where it operates.

3.2.1.5 Natural factors
This refers to the natural environment, which includes geographical and ecological factors that influence the organisation’s operations. These factors include the availability of natural resources, weather and climatic condition, location aspect, and topographical factors. An organisation is greatly influenced by the nature of the natural environment. For example, exploration and production of crude oil is often carried out in harsh, remote and even hostile locations such as the deep waters of the Gulf of Guinea / Gulf of Mexico, the frigid regions of Russia, and the hot, dusty, and
undeveloped deserts of the Middle East. It is always considered better to establish a manufacturing unit near the sources of input. Furthermore, the government’s policy to maintain ecological balance, and the conserve natural resources, places additional responsibility on industries. Figure 3.1 below depicts the forces which influence an organisation.

**Figure 3.1: Forces impacting organisations**

![Diagram of forces impacting organisations](image)

Source: Hellriegel et al. (2008)

As important as the environmental influences which affect the organisation are, so also the organisation has a significant impact on the environment. Goods, services, products, by-products and wealth from the organisation affect the environment. Therefore it is risky for the management of an organisation to disregard the requirements and pressures brought about by the exterior environment.

Fox (2006) notes in line with this view that organisations over a period of time cannot afford to exaggerate the significance of one subsystem at the expense of the others. Since organisations are communal systems comprising a spectrum of interconnected sub-systems which include managerial / administrative technological, and production sub-systems they should generally be sensitive to patterns and trends.
The realisation for strategic change can occur in various ways either through premeditation, discretely, arbitrarily, or chronologically (Thompson *et al.*, 2010). Managers should be able to notice their changing environment. This will help in keeping organisations in touch with the trends, events and ideas that should be factored into strategy.

Krause (2004) reinforces this opinion when he suggests that since the environment encapsulates various influences and hence contributes to strategic decision-making, managers must be able to make sense of the diversity. It is not enough to recognise scores of environmental influences, but unless they give an overall picture which will be of genuine importance to the organisation they are of no use to the organisation.

According to Peattie (2008), the objective of strategic management is to encourage the continued existence of business through ensuring organisations harmonise with the environment by making them more outward looking and future oriented and more systematic in responding to current and future external threats and opportunities. Strategy is fundamentally a major responsibility of organisational leaders and when organisations get it right they succeed and if they don’t they fail (Manning 2001).

Consequently, Hellriegel *et al.* (2008) are of the opinion that industries are directly affected by five competitive forces and it is important for managers to scrutinize / monitor and analyse each competitive factor individually and collectively for their combined strength, before making decisions about future courses of actions. The five competitive forces which impact an organisation are depicted in Figure 3.2 below.
Figure 3.2: Competitive forces in an industry

- Suppliers - include those who provide what the organisation requires to function, including finance, services, supplies, components and utilities; the bargaining power of suppliers often controls how much they can raise prices above their costs or reduce the quality of goods and services they provide;
- Competitors - those who are in the same business and others who compete for the same customer spend. Hence, any change in the environment that affects any competitor will have consequences that require some degree of adaptation;
- Customers - anyone who buys its products or services, they can increase competition amongst sellers, and
- Threats - will include any new product which can easily replace another good or service, including those who can make life difficult for business, such as an activist, lobbyist, industry association, the media, environmentalists, trade unions, host communities, and militia groups.

Another challenge is the rapid change in technology with the new face of global communication. This implies quicker and faster change in the present age. Therefore in the face of unpredictable and faster change, the reality is that it is quite difficult to understand future external influences on organisations and projects.
Managers in the world today need to consider both past and future environments, while applying structured methods to understand the future and hence concentrating on developing a dynamic and knowledge based organisation.

Features of a dynamic organisation according to Krause (2004) include:

- Transforming the status quo by creating new innovations;
- Deviating from business as usual to business unusual, while developing new opportunities;
- Ethical considerations and being socially and corporately responsible;
- The way and manner stakeholders are interacted with and managed, and
- Engagement with employees.

An organisation’s ability to adequately manage complexity may give it a competitive advantage, a strategic competence based on experience and learning. The most basic tenet of strategic management is that managers must adjust strategy to reflect the environment in which a project operates.

### 3.2.2 Project Environment

According to Heyns (2011) and Hodgetts and Luthans (2003), research has repeatedly found strong links between business performance and the alignment between an organisation’s environment, strategy, and projects. Krause (2004) indicates that projects are executed within a range of contexts and are not carried out for their own sakes. Neither do they happen in isolation. They occur to contribute towards innovation or progress in commerce / trade, industry, education and civilization. Hence they are also inevitably predisposed towards external factors.

To appreciate the conditions which influence the success of a project, it is necessary to consider the surroundings in which the organisation operates, and the alignment of the project strategy to that environment. This covers a broad area, and includes everything outside the control of the organisation.

Hence managers will do better to concentrate on those areas of the environment which predominantly influence the organisation or the project. Since the environment
changes continuously, purposeful scanning is necessary to keep abreast of the changes (Wheelen and Hunger, 2004). When one of the macro sub-environments changes, this may cause micro sub-environments to change as well.

The importance of environmental scanning, according to Hodgetts et al. (2003), includes:

- To determine which factors in the environment are a threat to the project because this will also serve as a threat to the organisation;
- To determine which factors in the environment create opportunities for the projects and hence the organisation;
- Organisations that scan the environment systematically are healthier than those that do not, and
- Organisations profit generally from shrewd environmental scanning.

It is important for management to increase their effectiveness by knowing and understanding the particular business environment in which they operate. The external and internal factors that affect the organisation’s environment are likely to affect the project environment and are linked to additional underlying forces such as uncertainty, instability and complexity, as can be seen in Figure 3.3 below.

**Figure 3.3: Underlying forces linked to the environment affecting a project**

![Diagram of underlying forces](source: Krause (2004))
According to Krause (2004), the interdependence is determined by the level of harmonisation between the internal and external environment. The outcome of interdependence in the industry environment is escalating instability and change. As the universal rate of change in the environment increases the impact of environmental variation on projects differs from project to project. Some projects experience greater environmental variation than others (Krause, 2004).

This probably explains why Wheelen et al. (2004) assert that a project reacts to external variables indicated by the intricacy of the environment while also considering any reaction to the variations within these variables themselves.

Available information and the reliability and meaningfulness of this information about the environmental variables indicate the extent of uncertainty about the business environment. Subsequently, the uncertainty about the environment will continue if managers cannot depend on the information.

3.2.3 Technology and innovation

Heyns (2011) cites the work of Fisch, Mcleod and Bronman who reported that within the past few decades, radio could penetrate a market audience of only fifty million in thirty-eight years, while television managed to reach that same audience in thirteen years. However, the internet conveyed the marketing message to those 50 million recipients within four years. Clearly, trends are indicating that the amount of new technical information is doubling every two years. The momentous transition from the agrarian age to the industrial age in the past decade is overwhelming.

A shift began in the twenty-first century where economies of nations all around the globe are evolving from working in isolated spaces, plants and factories as creators of wealth to work in conceptualising, development, and execution of ideas as creators of wealth.

The impact of globalisation and technology fuelled and ensured this shift to a knowledge age emphasised by information, communication, awareness, capacity and creativity. The management of technology and innovation is an issue that confronts all organisations today. The waves of change in the business environment include new
technologies and innovations that compel industries and organisations to find new ways to compete and to survive.

Technological innovation is very useful, valuable and is of critical importance to organisations and is currently the most significant driver of competitive success, mainly because of the globalisation of markets (Bruton and White, 2011; Schilling, 2005). Technology is moving very fast, advancement in information technology has assisted in accelerating the rate of technology (White and Burton, 2007; Schilling, 2005).

Global competition has ensured organisations are being continuously innovative in order to produce differentiated products and services. The push for innovation has raised the competitive bar for industries and its net effect on society is positive Schilling (2005). It enables the universal distribution of goods and services, ensures the efficient production of foods, improved health care, and enabled ease of travel and communication globally, reflecting that creativity and innovation are important to every economy.

Nevertheless, Schilling (2005), reports that technological innovation has its down side and is not all rosy. Ogungbemi, (2010) presents the same argument as he cites Olaniyan (1982) who is of the opinion that the traditional equilibrium which exists between the natural environment and the human race is being complicated by the interference of science and technology. As much as technology gives humankind greater control of the environment, its prospects are ironic, technology ill-applied, can as easily upset the delicate balance as it can, when carefully applied, lend itself to solving humankind’s problems.

An example is provided by situations where exploration and production technologies generate destructive pollutants which are toxic to the surrounding environments and communities resulting in environmental rot. Schilling (2005) defines technological innovation as the conception of fresh knowledge that is applied to practical problems. Schilling further asserts that the private sector is the highest sponsor of Research and
Development (R&D). In other words, business bears much of the responsibility for technological innovation.

Burton and White (2011) opine that the influence of technology and innovation is not only visible in organisational technicalities, but also impacts the behaviours and attitudes of workers, departments and units within the internal environments of the organisation hence, technology and innovation are an organisation-wide concern.

3.2.3.1 Definition of innovation
Gundry (2008) and Schilling (2005) suggest that innovation involves taking the creative ideas and solutions generated and identified as best suitable to the situation, and implementing those ideas and solutions in a way that creates new value for the organisation, the industry, or the society at large.

White et al. (2007) suggests that innovation can be deemed complete when it is transferred to enhance goods, processes, materials and services to plants / markets where they are suitable. It combines two major overlapping processes, having new ideas, and implementing them.

An assertion supported by Tidd and Bessant (2009) who assert that innovation in simple terms is the introduction of new technologies and new ways of doing things. It is driven by the knack to see links, recognize opportunities, and to utilise them effectively (Tidd, Bessant and Pavaitt, 2005), implying that innovation must be fresh, new, and of value.

3.2.3.2 Innovation
Innovation may occur internally or can be acquired externally. However, there is no doubt that it is the foremost motivating factor for the economic growth and development of organisations (Bruton et al., 2011; Maravelakis, Bilalis, Jones and Antoniadis, 2005).

Tidd et al. (2005) indicate that organisations need to manage the four phases which make up the innovation process and these include:
• Scanning and searching both the external and internal business environment to pick up process signals about potential innovation;
• Strategically selecting from this set of potential triggers for innovation before resources can be commit to it;
• Resourcing the option, providing the knowledge resource to exploit the options selected. This can be done by creating through R&D or acquiring through technological transfer, and
• Implementing the innovation, this involves growing it from an idea through various stages of development to final launch.

Internal innovation occurs when an organisation encourages creativity and team work amongst its workers across various disciplines. Innovation is external when an organisation purchases technology from another organisation which is already in the market ensuring quick access to the technology so that it, is not necessary to wait for its workers to interact and develop new technology which could take time and cause delay (Tidd et al., 2009).

With externally acquired innovation the organisation must find a way of integrating the technology or business unit into its structures. White et al. (2007) suggest that for internal innovation to occur a supportive environment is required within an organisation. Management must ensure that units, departments, and workers are encouraged to be innovative and the organisation must be seen to be positioned towards that direction.

There must be an amalgamation and synchronisation of leaders and the range of departments and units for support systems to achieve their objectives and aid the innovation process as required (White et al., 2007). Planning for innovation is a complex process and a wide range of issues must be scrutinized. White et al. (2007) further indicate that it is imperative for management to create the mechanism for innovation, hence the setting up of systems which are supportive of innovation. This requires restructuring and re-engineering as tools which can help in redesigning mechanisms for innovation through better integration and deployment of support and staff functions of the organisation. They advise that leaders must allocate sufficient
resources for the activities that are desired for the implementation of an innovative strategy. For it to succeed there must be enough financial, human and material resources available to accommodate the assumptions, experiments and blunders involved.

3.2.3.3 Types of Innovation
According to Bruton et al. (2011) and Tidd et al. (2005), there are many forms of innovation which can be classified into four different categories, they include:

- **Paradigm innovation** – changes in the underlying mental models which frame what the organisation does;
- **Product innovation** – changes in the goods or services which an organisation offers;
- **Position innovation** – changes in the context in which the goods or services are introduced, and
- **Process innovation** – changes in the manner in which the goods or services are created / extracted and delivered.

Even though innovation is critical in securing competitive advantage, it does not guarantee success. However, it is imperative for organisations to go the way of innovation especially in turbulent and rapidly changing sectors of the economy. Organisational survival is dependent on innovation to ensure the continuous renewal of products and services.

3.2.4 Technology
Awny (2007) and White et al. (2007) suggest that technology can be viewed from two different perspectives. It is fundamental to economic growth and is the foundation for improved health, longevity and quality of life, making it one of the dominant features of contemporary civilisation. On the downside, technology has been known to threaten jobs, the violation of life itself and even the destruction of civilisation and it has by far had one of the greatest impacts on material wealth and society’s fortunes, as well as extensive influence on organisations.
Technology has been defined in different ways. According to Bruton et al. (2011), some of the various definitions include:

- The technical way people use to improve their environs and activities;
- The application of knowledge to perform work;
- The theoretical and practical knowledge, skills and artefacts that can be used to develop products as well as their production and delivery system, and
- The employment of theoretical and practical mechanisms and systems to create and distribute products and services.

However, Bruton et al. (2011) define technology as the systematic and sensible application of skills and expertise by organisations and individuals to improve the production of goods and services thus indicating that technology involves methods, tools and processes requiring a logical layout of equipment or machinery to deliver the desired outcome. It concerns breakthroughs used by society to fulfil desires and amend the environment to develop lives. It can be embodied in people, materials, cognitive and physical processes, plant, equipment and tools. Therefore technology can be seen as a complex, dynamic process of organisational interactions which includes procedural and organisational arrangements for carrying out required or necessary transformations.

Technology can be continuous in nature where the changes in technology are not a constant progression, but happen over relatively short periods of time, for instance, the computer which keeps getting lighter and more mobile annually, or the mobile phone which is fast becoming more like a computer. Technology can also be radical and result in a spectacular revolution; it can literally alter the status quo, launching a new functionality and a fresh manner of approach in business and societal activities (Heyns, 2011; Bruton et al., 2011).

To use technology as a competitive advantage, managers must manage technology as part of the business and ensure it is integrated into the organisation’s strategy, this is where the challenge lies for top management (Krause, 2004). An organisation cannot isolate one unit and say it is concerned with technology while the rest of the organisation ignores such issues, the whole organisation must embrace it in totality.
The importance of technology to business cannot be over-emphasised. White et al. (2005) quote former US Federal Reserve Chairman, Alan Greenspan as indicating that technology is the bedrock of business and organisations will be driven by technology and its application in the future.

Technology is a critical resource of profound importance for corporate profitability and growth. It also has gargantuan implications for the well-being of national economies as well as international competitiveness. Effective management of technology links engineering, science and management disciplines to address the issues involved in the planning, development and implementation of technological proficiencies to shape and accomplish the strategic and operational objectives of an organisation (Bruton et al., 2011).

To successfully manage this task organisations require new management skills, techniques, styles and ways of thinking. Arguably the most vital source of competitive decline is an organisation’s failure to appreciate the dynamic nature of technological advantage.

Against this backdrop, White et al. (2005) suggest the following requirements for managers to adequately manage technology, they must:

- Analyse the industry configuration both nationally and globally;
- Predict potential changes;
- Understand the competences of the organisation and those of its competitors, and
- Carry out a financial analysis of the product and the organisation.

It is important to note that ignorance and the wrong attitude could potentially undermine the cutting-edge technologies. Education and lack of skills are major challenges facing workers in organisations. Business can implement the best and the latest modern technologies. If the workers do not have the skills and the willingness to learn, the investments are fruitless.
3.2.4.1 Technological environment

The technological environment is made up of several products and services which exist as a result of human ingenuity, expertise, skills and initiative, hence it is always evolving for the simple fact that humankind is always trying to improve its environment.

Jones and Hill (2009) agree that the speed of technological revolution has increased resulting in technological changes which can in hours make established products obsolete overnight and simultaneously creating a host of new product possibilities as mentioned previously. An assertion supported by Heyns (2011) who indicates that the amount of new technical information is doubling every two years. This means that for students starting a four-year technical degree, approximately half of what is taught in the first year of study will be out-dated by the third year of study.

Continuous research in the arts and sciences is constantly creating new potentials and opportunities for the application of human vision. This will assist organisations to achieve better output and needs satisfaction with less input and effort. Research suggests that the performance of an organisation interrelates closely with the technological environment in which it operates (Narayanan, 2001). Therefore, it is the responsibility of management to ensure that the organisation’s technology strategy is integrated into the organisation’s business strategy.

As management of technology involves the handling of technical activities in a broad spectrum of functional areas including basic research, applied research, development, design, construction, manufacturing or operations, testing, maintenance and technology transfer. The central challenge of management is viewed as orchestrating organisation activities to meet the challenges of the business environment. Thus understanding the technological environment is critical to the successful management of technology. This is concerned with the level and direction of all technological processes or advancement taking place in society, including new products, processes, materials and the general level of scientific activity and advances in fundamental science.
This is particularly necessary for organisations in developing countries where it is imperative to leap from stumpy survival technology to high information era technology because they are yet to make the most of or adopt contemporary technology which has created a void in their competitive advantage relative to nations with developed economies (Krause 2004). Therefore, the impact of technology and innovation is crucial in developing models which will assess prospective projects.

To enable developing countries to utilise technology for growth, they must unleash entrepreneurial and management / leadership training, since indications from global trends are showing that it is almost impossible for organisations to survive outside of technology. Figure 3.4 below depicts the technological factors which influence projects.

**Figure 3.4: Technology influences on management of projects**

![Diagram showing the technological factors influencing project management.](source: Krause (2004) modified by author)
3.2.4.2 Movement and transfer of technology

Managing technology effectively is crucially important to the success and survival of individual organisations and to economic well-being and growth. Its ultimate role is to bring about development by solving predetermined socially significant challenges / problems, improving standard of living, and promoting equitable circulation of income, opportunity and wealth. As stated earlier, organisations are seen as the most effective agencies for acquiring, developing, transferring, utilizing and circulating technology internally and across industrial sectors or countries.

It is worthy to note at this stage that the appropriateness of any form of technology and the methods used for its acquisition and utilization are very situation specific. This means that it is imperative for the technology transferred to be useful and beneficial to the receiver. However, just because a technology is the newest or the most modern does not make it the best technology for every organisation, industry or country.

Therefore, for developing countries it is necessary to ensure that the technology adopted is more in line with its needs and resources. It must enhance the technological capacity of the organisation to enable it to carry out its critical operating and strategic management functions and tasks with competence, using cost-effective systems and processes with value on a sustainable basis and to satisfy the salient and legitimate needs of its internal and external stakeholders.

For technology to be valuable it must be utilised by one or more users. Circulation of technology is thus seen by Wheelen and Hunger (2004) as a practice that allows the passage of technology from a supplier / source to a receiver.

Krause (2004) citing Khalil (2000) indicates that when science and technology transit from one person or group to another person or group who incorporate and integrate the new information into systems and processes then technology has been successfully transferred. Against this backdrop Krause (2004) suggests the various ways in which technology can be transferred to include:

- From one firm to another within the same industry (intra-transfer);
• From one industrial sector to another, across industries;
• From one organisation to another (inter-organisation);
• From one region of the country to another region within the country, and
• Across national boundaries from developed countries to developing countries, (international transfer).

Technology transfer is not a rapid fix intervention route but a marathon. It takes time and requires an effective utilization of the new technology. That has defied many organisations in developing societies. To successfully transfer technology organisations must first identify key stakeholders with whom they must contend in order to obtain and use the technology within the most favourable environment. In developed societies these will be employees, while for developing countries external stakeholders and environmental factors are extremely critical for the introduction and successful utilization of technology (Bokeno, 2008).

3.2.4.3 Channels of flow of technology

The world’s stock of innovation and technology is concentrated in a few industrialized nations such as the USA, United Kingdom (UK) and West Germany (Schilling, 2005), indicating that for organisations in the developing countries to acquire technology they must approach these countries.

Because technology is intangible it flows easily across boundaries of countries, industries, departments or individuals provided that the channels of flow are established.

Krause (2004) describes three types of channels that allow the flow of technology as:
• Planned channels
Here the intention is premeditated and the inventor / possessor of the technology is engaged and the method of transfer is planned with the possessor’s consent. The right to use and lawful authorization is given by the possessor either via franchise, joint venture agreement, foreign direct investment, and technical consortium and joint R&D projects.
• Reverse engineering channels
At this point the beneficiary of a technology can break the cipher of a technology and may have the competence to replicate it without the knowledge of the source, a possible scenario, especially if there is no criminal contravention of intellectual or property rights.

- **Common channels**

Here technology is transferred inadvertently. Information is readily available in an unrestricted field or realm with no limits on its exploitation. There is no control on when and how the data are used. Examples of this style of transfer include teaching, coaching, publications, and conferences.

Various agencies are involved in the transfer of technology; it could be private, public or voluntary organisation, local, national or international. If it is a private organisation it could be a subsidiary of the MNOC, a JV, a consortium or a state-owned enterprise.

For instance, MNOCs are transferring technology associated with oil exploration and refining to countries such as Saudi Arabia, Egypt, Syria, Nigeria, Angola, Ghana, and recently Kenya. Effective transfer of technology, knowledge and skills necessitates building local technology capacities. However, according to Awny (2007), a major challenge faced in situations where technology is transferred from more industrialised countries to developing countries is a lack of necessary infrastructure and skilled personnel. Steenhuis and Bruijn (2007) indicate that the key aspect in the failure of technology transfer to contribute to industrial development is that organisations generate skills in a narrow production area instead of on the basis of knowledge that creates a sustainable competitive industry position. Therefore, it is important to recognize the importance of public policy and environmental factors in facilitating or preventing effective transfer and utilization of technology.

However, it is vital for all stakeholders to understand that the creation and introduction of new technology requires change. The requirement for the successful application of existing technology resists change, so that tension between these two is inevitable.
3.3 Culture and change

The dynamics of an ever-changing business environment have made it imperative for several organisations to imbibe elemental changes which in certain instances require transforming an organisation’s very essence, its corporate culture.

According to Bokeno (2008), relative to organisational dynamics and development, organisational transformation is arguably the most talked about phenomenon in the past two decades. Organisational change control is vital and the biggest challenge is the human element. The need for organisational change is often rooted in threats or uncertainties within the competitive business environment (Mische, 2001). These threats may be a result of a decline in organisational performance or trends that suggest the organisation is susceptible to loss of market share, competitive advantages, and critical resources or when its reputation is on the line.

Diverse types and conditions of change occur within organisations. The type of change appropriate for an organisation depends on both business complexity and socio-technical uncertainty. The change could be strategic, systematic and incremental change, with each of these states involving a variety of levels and degrees of change depending on the environmental settings (Krause, 2004).

When complexity and socio-technical uncertainties are greater, organisations may be predisposed to employ planned changes. Planned organisational changes have had the most consistent effects on organisational work settings, including coordination and control of work, reward system; social interactions have also significantly impacted individual employee behaviour and organisational outcomes (Erickson 2011). From whichever angle the need for change is viewed, it is imperative for organisations to remember when initiating change that the workers will support what they create. Hence worker engagement is a prerequisite for a successful change agent (Khadair, Shamsudin and Subramaniam, 2011). Bokeno (2008) defines this change as a bewildering multitude of unique actions, conducts and campaigns in organisations with the sole purpose of influencing employees and employers to embrace / imbibe novel sets of thoughts and beliefs. Goetsch and Davis (2003) agree that organisational change occurs when an organisation goes through the process of adapting fresh ideas.
to become different, that is if the ideas learned, attitudes and skills are sustained for a period of time (Bokeno, 2008).

The impact of both national and global environmental influences on organisations cannot be overemphasised, especially since the economic recession which resulted in the financial crisis that engulfed the world economy in early 2007. The causes were analysed as exposure of the US financial sector to subprime mortgages, a high-risk form of home loan that proved lucrative when the housing market was booming. By late 2007, it was obvious that the crisis had spread when the UK’s, Northern Rock bank collapsed. Thereafter, there was no stopping the domino effect of the crisis which spread to most of the rest of the world, with Europe slumping deeper than expected.

Falling share markets, decreasing industrial growth and an overall negative mood in economies around the world resulted in a decline in business and consumer confidence, with companies making cutbacks and households trying to save more as society worried about job losses. Both were hurt by tighter credit conditions that raised the cost of borrowing money. The impact of markets, technology and innovation, politics, economy, social and cultural issues and others have reiterated the need for businesses to adopt changes to maintain competitive advantage in order to remain relevant (Krause, 2004).

This change differs in magnitude and can be total, where it involves the whole organisation or a subdivision or functional unit of the organisation, or corrective that is, it seeks to address minor, major or developmental challenges. Hence the need for reviewing and reworking the approach adopted to address some problems to avoid reoccurrence. Either way, in modern organisations, a change agent is typically associated with a change in the organisation’s culture (Bokeno, 2008).

Whether viewed anthropologically, sociologically, or organisationally, culture is a complex topic. Culture has been perceived from various angles, some of the views expressed point to systems, beliefs and values, others tilt towards knowledge, processes and procedures, a few emphasize shared meanings, others suggest an
organisation’s ethos, while some cite myths, symbols, and rituals. It implies the way things are done within a certain milieu or organisation (Jennex, 2008; DuBrin, 2012).

This connotes a value system. A value system comprising elements related to everyday operating principles such as priorities, furthering of specific habits and beliefs over others, a predilection for appropriate courses of action or results, and considerations of what is right or wrong or what should be. These values tend to influence attitudes and behaviour including those that are related to H&S performance. One generally agreed-upon definition is the set of shared attitudes, values, goals and practices that characterize an institution, organisation or group.

Palmer and Hardy (2000) assert that the management of culture remains an integral part of top management activities. They report that culture migrated into organisational studies in the early 1980s where it was used to explain such management issues as dedication, socialization, revenue, challenges of productivity and competition. Palmer et al. (2000) suggest that at least three different types of culture operate in many organisations, these include: an operator culture, denoting persons who do the work; an engineer’s culture, persons who design and monitor the technology, and an executive culture, persons who manage the process. They indicate that without reference to wider social influences, pressures and processes, it is difficult to understand organisational culture.

Within the last decade in the 1990s to be precise, a shift occurred from using an organisation as a unit for focus on the study of culture to a holistic approach where the industry in its totality is used. The result is the establishment of an industry culture where mind-sets which transcend sub-organisational, trans-organisational and organisational boundaries are held in common by members of separate industries (Palmer et al., 2000).

This gives organisations the opportunity to emulate the culture of thriving players in the industry which could ensure that macro-cultures of industries, composed of shared beliefs of managers across industry organisations may facilitate inter-organisational negotiation and trust amongst top managers. This will result in agreement on the strategic issues facing the industry, while enabling managers to develop common
interests. However, the risk of such a situation will be that it could lead to lethargy, hamper creativity or initiative, and thwart innovation, causing the collective failure of industry.

Once a change of any kind is apparent, organisations must immediately latch on to the idea of changing the culture. Manning, (2001) indicates that this is based on the assumption that when workers get their attitude right, all will be well. However, the best strategy to integrate this change is to change the mind-set of workers and then worker behaviour will change.

Hence Manning (2001) asserts that the best approach for organisations is to change what people do and how they do it. He reinforced this view by suggesting that organisations in achieving change should inform workers why new results are needed, set new objectives, involve workers in identifying priorities and in creating action plans, and get prompt feedback, while ensuring that performance is effectively reviewed.

Krause (2004) claims that strategy cannot be implemented without initially bearing in mind corporate culture. When a change agent introduces a new strategy, it is paramount that the culture is prepared to back it up. The fact that the corporate culture at the top level is supportive does not automatically imply that the entire organisation is positioned to chase the same goals. He advises that organisational leaders responsible for the change implementation must not be insulated from the dynamics of the corporate culture at the top. Many intelligent well-thought-out strategies are so often thwarted in the implementation phase because it is the organisational culture that prevents the strategic change from taking place.

3.3.1 HS&E culture

As mentioned previously, change is inevitable in project-driven organisations and successful organisations build cultures that can adjust rapidly because of the demands of each project, and yet adjust swiftly to a continually changing vibrant environment. Hence organisations are aware that competitive success is attainable only if they achieve cultures that promote the necessary attitude (Krause, 2004).
According to the HSE (2000), possibly the most important quality of organisations that are good in managing HS&E is their corporate culture. They are good in engendering a successful structure to maximise the involvement of workers and groups while ensuring HS&E objectives are regarded in the same way as other business objectives.

Because accidents, ill health, and incidents are hardly ever random events they usually occur due to failures of control and involve several causative elements. The immediate cause may be a human or technical failure, but they usually arise from organisational failings which are the responsibility of management, solely because management drives the culture in any organisation and the corporate values and norms determine company policies and practices (Holt, 2005).

Successful HS&E policies should aim to exploit the strengths of workers and maximise the contribution of human limitations and fallibilities by examining how the organisation is structured and how jobs and systems are designed. Organisations need to appreciate the impact of human factors on H&S performance hence should base the corporate culture upon organisational behaviour because a good corporate culture can also foster better relations with stakeholders, especially host communities (Hughes et al., 2007).

Effective HS&E requires management support, but over and above this support are psychosocial factors which research has shown are the most predictive factors of effective H&S performance (Hughes et al., 2007; Erickson, 2012). Erickson (2012) suggests that since these same factors also influence other areas of organisational functioning, then perhaps the emphasis should be on the organisation's culture and not solely on HS&E culture.

Erickson (2012) further asserts that perceptions are a significant aspect of effective HS&E management, which is how managers view workers or how workers view managers because it is vital to aligning the thought processes, ideas, beliefs, biases, miscommunication, and other elements that interfere with optimal HS&E performance since perceptions are realities. In an organisation, people with different
opinions and life experiences are going to have different perceptions. If people do not have similar perceptions, communication will be a major challenge.

Effective corporate cultures in organisations should not be based only on processes but on HS&E related behaviour, through actions / attitude and activities within the organisation. Irrespective of the type of organisation HS&E can exist within the configuration of the organisation (Holt, 2005). However, training employees to imbibe behaviour-based H&S is not the absolute solution, but if applied in a proper context, it enhances and improves the effectiveness of other proven technologies and methods that have been developed over the years. Nonetheless, organisations should not accept behaviour-based H&S as a substitute for poor engineering (Brauer, 2006).

According to Hughes et al. (2007), the following components must be present to achieve a positive HS&E culture:

- Leadership and commitment to HS&E from top-management right down through all levels of the organisation;
- Recognition that excellence in HS&E is feasible as part of a continuing strategy formulation by the organisation;
- A comprehensive appraisal of HS&E threats in the organisation and the development of suitable control and monitoring systems;
- A HS&E policy statement outlining, codes of practice and required HS&E standards, and short and long-term HS&E goals;
- An appropriate training programme for employees and communication and consultation procedures;
- Structures for monitoring equipment, processes and procedures and the speedy rectification of any defects, and
- The quick analysis of all occurrences and accidents and reports made itemising any essential corrective actions.

However, organisations must channel adequate monetary and human resources towards realising these targets.
The pace of maturity of corporate culture may be dependent on the size of the organisation, nature and magnitude of its projects and customers and clients. The culture within the organisation must support the core values of effective communication, collaboration, teamwork and trust for effective ensconcing of the corporate culture.

Rwamamara (2007) posits that the influence of globalisation, turbulent markets and information and communication technology (ICT) growth, has ensured that organisations require a more productive and innovative work force and every worker wants a healthy and stimulating environment.

The human capital of an organisation is its back bone and hence very important to the success of the organisation (HSE, 2000). With workplaces becoming increasingly diverse, management task is clearly cut out. It is notable to mention here that although the corporate culture in itself cannot be quantified or evaluated as a function in absolute terms, its effects can be if a validity instrument is used. It can have great benefits for the organisation, its viability and its employees. This is the first step. Once this is achieved, the HS&E leader’s / professionals' responsibilities are made easier. It also enhances the abilities of those with human resource, quality, continuous improvement, and other organisational responsibilities to meet goals. A variety of concepts, tools, perspectives and roles are important and useful to the management of change, strategy and culture. However, it is the premise of the study that the leadership of managers is critical to the success of these endeavours.

3.4 Leadership and management
Rowe and Guerrero (2011) indicate that a clear divide exists between management and leadership, despite the fact that they both have similarities such as influencing people, working with people and achievement of common goals. They suggest that managers are reactive and work with people with minimal emotional involvement, whereas leaders get emotionally involved and seek to shape ideas rather than reacting to other’s ideas. Notwithstanding, leadership is an important aspect of the manager’s task but certainly not all of it. Planning is an important managerial function, but it does not necessarily involve leadership hence one could act as a leader without doing
any planning. Unlike management the concept of leadership implies that the leader is producing his / her output as well as co-ordinating or guiding the work of others.

Some researchers suggest that the function of leaders is to create change, while a manager’s function is to create stability. Others assert that there is no meaningful dichotomy between management and leadership. Managers limit choice, while leaders work to expand the number of alternatives to problems that have plagued an organisation for a long period of time. Leaders change people’s attitudes, while managers only change behaviour (Achua and Lussier, 2010).

An informal group leader might exercise as much as or more influence over a group of employees than a manager. Hence, according to Rowe et al. (2011), managers need to concurrently be managers and leaders. They cite Kotter’s (1998) claim that organisations are excessively managed and weakly led, although strong management with poor leadership is worst.

Rowe et al. (2011) suggest that organisations require a high degree of both leadership and management. This ensures that managers are able to handle the intricacy of forecasting, budgeting, recruitment, controlling using formal authority and problem solving. Managers believe that their decisions are influenced by their organisations and the business environment they operate in. Table 3.1 below depicts the stereotype difference between a leader and a manager.

Table 3.1: Stereotype of the difference between leaders and managers

<table>
<thead>
<tr>
<th>Leader</th>
<th>Manager</th>
</tr>
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<tbody>
<tr>
<td>Visionary</td>
<td>Rational</td>
</tr>
<tr>
<td>Passionate</td>
<td>Businesslike</td>
</tr>
<tr>
<td>Creative</td>
<td>Persistent</td>
</tr>
<tr>
<td>Inspiring</td>
<td>Tough-minded</td>
</tr>
<tr>
<td>Innovative</td>
<td>Analytical</td>
</tr>
<tr>
<td>Courageous</td>
<td>Structured</td>
</tr>
<tr>
<td>Imaginative</td>
<td>Deliberate</td>
</tr>
<tr>
<td>Experimental</td>
<td>Authoritative</td>
</tr>
</tbody>
</table>
Leaders are more philosophical, they believe that their choices will affect their organisation, which will in turn reflect on the industry or environment in which they operate. Rowe et al. (2011) conclude by suggesting that organisations need people who do the right thing and do it right.

Often management builds an assent culture rather than trust in type of culture. Leaders must create an atmosphere in which people believe in strategy, believe in management decisions and believe in their work. Successful leaders always create this sort of environment both inside and outside the organisation (Rowe et al., 2011).

Creating a fearful atmosphere is another major management blunder since fear badly affects an organisation’s strength and success (Chowdhury, 2005). Achua et al. (2010) warn that the old command-and-control model of management is not acceptable in today’s global economy. Instead a more collaborative approach to management is what works and is imperative that management adapts. This encourages both leaders and managers to influence each other to bring about change to continually improve the business.

Leaders are good at this because they are responsible for setting the course, aligning, motivating and stimulating people, a combination necessary to handle change. Change
throws up the need for leaders, leaders tend to bring about change, implying that leader’s enthusiasm and the ability to work with people are important components of leadership (DuBrin 2010; Dessler, 2004). Therefore, organisations need managerial leaders or leader-managers to successfully implement change.

Particularly with H&S leadership which is a vital component of any HS&E process HS&E professionals are responsible for ensuring that employees are made aware of the HS&E goals, made aware of how they are performing and then motivated on how to improve, or else the benefit of a goal that does none of those things is unclear. Yes, there are employees out there that are a challenge, but they are the reasons why managers and HS&E professionals go to work every day.

### 3.4.1. Theory X and theory Y

This theory is arguably not a theory of leadership; however, the leadership strategy of effectively used participative management has had a tremendous impact on managers. The idea as postulated by McGregor indicates that a leader’s premise about human nature impacts on the type of leadership style applied (Bolden, Gosling, Marturano, and Dennison, 2003).

The theory suggests that there are two basic classes of people: those who want to lead and take responsibility, i.e., the leaders and managers, and those who want to be directed and do not want to take responsibilities. On this basis Western (2008) documents the trait theory in management styles as theorized by McGregor in 1969.

The theory classified leadership as either an authoritarian style (Theory X), because of the need to control and coerce unwilling workers, or a more egalitarian style (Theory Y), which builds relationships and encourages a participative leadership style. It is more enlightened, and adopts needs to fit the situation (Western, 2008). This distinguishes between managers who manage in a Theory X style and those who manage in a Theory Y style. McGregor’s theories present a philosophical stance, hence are difficult to validate.

Theory X management / leadership is based on the assumptions that:
- Individuals prefer to avoid work if it is possible to do so;
As a result of 1 above, employees need to be closely monitored, directed, and controlled;

Employees have to be coerced into achieving organisational targets, and

Employees have no desire to accept responsibility.

According to Theory X, management should not trust employees with important decisions. They are altogether excluded from the decision making process. Management assumes complete responsibility for organizing, planning, making important decisions, directing and motivating people. This implies that if management does not act, employees will do little or nothing. In other words, theory X persons assume others are lazy and must be controlled so theory X organisations use command-and-control methods with their employees.

Whereas, Theory Y of management / leadership represents the other view that:

- Work is natural to life;
- Personal and organisational goals can be integrated;
- Employees will act optimistically to targets to which they are committed; and
- It’s possible to achieve emotional satisfaction at work, and
- Under the right circumstances employees will accept responsibility.

Implementing a Theory Y approach, a manager nurtures an environment, which is conducive to the growth of both organisation and subordinates. The theory recognizes that employees have the ability to be high performers, to develop and assume responsibility and are enthusiastic. In other words, theory Y persons assume others are self-motivated and have a need to be challenged. Theory Y organisations treat employees as individuals and with more openness.

Therefore, management only has to engender the appropriate working conditions to bring out all these abilities. With the right kind of leadership, where employees are treated as individuals and with respect, the style will increase healthier and safer performance, increase job satisfaction and lower psychological stress, decrease absenteeism, and increase profitability and productivity (Erickson 2011). This enables management to trust employees and assign responsibility for taking important decisions to lower levels. The overall effect is to make work inherently satisfying to the employee.
According to McGregor’s theory, the role of a manager is not to ask which theory of human nature is correct but rather to assess the reality of the job situation, and how to motivate employees to keep them involved and contributing to tasks. In other words, whether managers adhere to Theory X or Theory Y will be reflected in how they relate to and communicate with their team in different circumstances.

3.4.2 Leadership

The several documented definitions of leadership indicate the complex nature of leadership, making it arguably one of the most observed, but least understood phenomena. According to Arimoro (2010), leadership can be viewed in various forms some of which include the act of steering people towards a certain objective, course or route, the act of supervising or managing people through giving guidance, taking responsibility for one’s actions and those of others in a group activity.

It is imperative for a leader to not only rule well but also carry the people along while keeping in mind the fact that leadership is not about position and power. DuBrin (2010) suggests that leadership is not only found among people in high-level positions. It is needed at all stages in an organisation and can be practised to some extent even by people not assigned to a formal leadership position.

Research on leadership has indicated that there may be a need to change leadership styles relative to conditions, suggesting that a single leadership approach may not be appropriate in all situations (Fields, 2008). Therefore organisations will need to develop a leadership approach which best fits its requirements and suits its environment. This suggests that a key leadership skill could be the knack of identifying the appropriate leadership style which fits a particular situation.

According to Ghillyer (2009); Northouse (2004); Hellriegel et al. (2005); Yukl (2002) and Maxwell (2002), leadership in pure and simple terms is influence. Implicit in this statement is that leadership is an observable and acquirable set of skills and abilities. Furthermore, true leadership will function within any environment, after all leadership is about beating the odds.
3.4.2.1 Leadership challenges
Leadership in today’s organisations is faced with a number of significant challenges. As mentioned previously, organisational tasks and business environment become increasingly complex. Rapid technological advances, proliferation of team based organisations and increased employee empowerment require that leaders adapt their techniques and styles of leadership to meet these new challenges.

As the economy limps on with nations addressing the economic crisis, organisations are going to face a crisis of survival. In Nigeria, the internationalisation of the environmental crisis has inflicted terminal damage on the reputation of MNOCs. Their mode of operation has come under austere scrutiny more than ever before; they require leadership that can provide stability, reassurance, confidence and a sense of control during and after the crisis. This could help cushion the effect of the media frenzy generated by the oil crisis.

Fields (2008) indicates that management researchers and authors point to other challenges which affect leaders. Fields (2008) proposes that relative to organisational conflict in the next decade, the growing gap between affluent and poor groups as a source of continued unrest will pose a possible challenge for organisations. A scenario which presently is playing out in Nigeria where disparities in wealth though have always been in existence, with technological changes the differences are much more evident than ever, possibly fuelling high degrees of unrest.

Added to this blend is conflict between organisations and nations, as large for-profit MNOCs stretch their presence and influence across international boundaries, often connecting workers more firmly to the organisation rather than their home country.

Global organisations have access to huge material and financial resources. This enables them to extend their influence further through increased continued globalisation of markets and the outsourcing of work and services in other parts of the world.

Fields (2008) considers that the most vital test of a leader could be the ability to successfully guide change, since evidence suggests that few organisations will survive
over the long term without it. Fields (2008) indicates that since essentially organisational change is often resisted, effective leaders in the twenty first century need to be aware of alternative approaches to leadership and the implications of these models for different contexts and needs.

In the background of this situation Fields (2008) suggests that to meet the challenge of change and globalisation, twenty first century leadership is required to:

- Implement latest technologies and revise business processes and worker / manager roles to ensure efficient use of technologies;
- Develop innovative perspectives regarding the nature of the business objectives and goals of the organisation;
- Develop perspectives about the nature of the mission of the organisation and its part in society and its responsibility towards the community and the general public. Successful organisations must be accountable to their business environment and must have a vision for their responsibility and contribution to making the planet a better place;
- Make products and services attractive to customers in different cultures, and
- Work effectively with members of different cultures as fellow workers, providers of outsourced services, or as venture partners. Twenty-first century leaders will become more multi-skilled in the knowledge of languages, cultures and a wide range of subjects will be vital to achieve success.

Western (2008) and Dessler (2004) posit that leaders must also ensure that they not only engage effectively with their people, but also connect emotionally with them. They must engender an atmosphere in which people believe in strategy, believe in management decisions and in their work.

Cultural distance is a huge challenge facing organisations, the ability to embrace and manage diversity as a business strategy will ensure organisational success. Twenty-first century leaders will hunger for their next goal. As soon as success has been achieved they will immediately set out to achieve the next one (Fields, 2008).
3.4.3 Leadership theory paradigm

Achua and Lussier (2010) suggest that leadership theories have practical value because they are used to better understand, predict, and control successful leadership. They define a leadership theory as a concept which sheds more light and clarifies some aspect of leadership. Leadership is influenced by numerous factors relating to traits, behaviour and situation. It is the outcome of a complex relationship between leaders, subordinates, the organisation, social values, economic and political conditions.

On the other hand, leadership can be viewed and defined by observing individual leaders and analysing their internal personal traits, approach to task and relationship with team / group members (Western, 2008). Western (2008) states that to understand the difference between good and bad leaders, the concept of leadership can be understood through four classifications of leadership theory, which include trait, behaviour, situational and integrative. These classifications represent a change in the leadership paradigm.

3.4.3.1 The trait approach

Western (2008) opines that the trait viewpoint is a traditional concept which suggests that effective leaders have personality traits which distinguish them from the common herd. It suggests that leadership is inherent in a few select people and that leadership is restricted to only those few who have special talents with which they are born. Hence it is alleged that some people are natural leaders gifted with distinct traits not possessed by other people – a controversial theory considering it is yet to be proven that a one size fit all attribute exists for leaders. However, this traditional approach to leadership, according to Achua et al. (2010), assume that leaders are born and not made.

Research and studies have been conducted to attempt to differentiate leaders from non-leaders by trying to identify the aspects of their individual characteristics, to determine which personality make them exceptional leaders (Fields, 2008; DuBrin, 2010). It emphasises physical attributes such as personality, values, skills, age, height, intelligence, academic achievements, judgmental ability, and insight.
Some personal characteristics investigated include the ability to speak well, an extroverted personality, originality, initiative, persistence, tact, patience, or unique physical endowment such as gender, weight, height, stature and attractiveness, appearance, psychological traits that all successful leaders possess (Yulk, 2006; Fields, 2008; Ghillyer, 2009; Achua et al., 2010). The list of traits was to be used as a prerequisite for promoting candidates to leadership positions.

The result of the investigation identified several traits that were associated with measures of leadership effectiveness, but the findings were seldom replicated in multiple studies (Fields, 2009; Achua et al., 2010), probably because as Ghillyer (2009) noted, traits related to leadership in one situation may not necessarily prove to be predictive in other cases. However, traits that are related to leadership success have been identified from the various studies (Achua et al., 2010).

### 3.4.3.2 Behavioural approach

The behavioural approach to leadership is based on the concept of how a leader behaves and what actually is done to achieve effective leadership (Achua et al., 2010). The leadership approach adopted by managers to motivate workers to buy into organisational goals and objectives is important since according to Maxwell (2002), the success or failure of an organisation is totally dependent on its leadership and it makes the difference when it comes to making an impact in any organisation, implying that everything rises and falls on leadership.

Africa is experiencing a crisis of leadership at both the national and organisational level. The prevailing cases of sit tight dictators, corruption in government, lack of accountability / transparency and failure of leaders to effectively guide nations to economic / industrial growth continue to reverberate within the continent.

On the other hand, little is known about the personal characteristics and the related precursors that expedite the emergence and effective utilization of high quality leadership in organisations in Africa. One aspect is certain; leadership should not be equated to formal education or management development. Nigeria, despite its high rate of educated nationals is still experiencing leadership challenges at both political and organisational level. The failure of the State has been blamed wholly on poor and
visionless leadership (Saraki, 2010) and this has cascaded down to other sectors of the nation.

Leadership is a significant requirement to move people to action. There is a tendency for a leader to rise or fall. However, in the course of the learning process he / she stabilises. Leaders as mentioned earlier fundamentally, effectively encourage and induce workers to action and easily carry workers along to achieve organisational targets. Leaders are those who can influence the people in the organisation to carry out the required behaviour.

Achua et al. (2010) indicate that among the multitude of research projects conducted to study the relationship between leadership behaviour and measures of leadership effectiveness there is no agreement on one best leadership style for all management situations. However, two generic dimensions of leadership behaviour have been identified as important for accounting for effective leadership and they include, task and people-oriented leadership.

In other words, different behavioural leadership approaches exist which can be used to influence people depending on the particular situation. This allows leaders to adopt a leadership style which is appropriate to the needs of the particular situation at any given time. A range of leadership archetypes that show how different types of leaders use particular methods to influence people is shown in Table 3.2 below.

Table 3.2: Leadership archetypes to influence styles

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<thead>
<tr>
<th>Leadership archetype</th>
<th>Influence behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authoritarian</td>
<td>• directive and dictatorial</td>
</tr>
<tr>
<td></td>
<td>• punitive measures</td>
</tr>
<tr>
<td></td>
<td>• use of position power</td>
</tr>
<tr>
<td></td>
<td>• expectation of conformance to leader’s directives by subordinates either to avoid sanction or in blind obedience to formal authority</td>
</tr>
<tr>
<td>Transactor</td>
<td>• instrumental exchange relationship between leader and subordinate</td>
</tr>
<tr>
<td></td>
<td>• rewards and compensation</td>
</tr>
<tr>
<td></td>
<td>• use of reward power</td>
</tr>
<tr>
<td></td>
<td>• expectation of calculated compliance with desired behaviour by subordinates in order to secure rewards</td>
</tr>
<tr>
<td>Transformational</td>
<td>• creation of vision</td>
</tr>
<tr>
<td></td>
<td>• charismatic relationship with subordinates</td>
</tr>
</tbody>
</table>
use of personal power
• expectation of compliance with desired behaviour by subordinates through collective vision in which everyone benefits

| Empowering and participative | • emphasises self-influence and ownership
• facilitative and consultative behaviour
• empowerment of subordinate
• expectation of enactment of desired behaviour by subordinates through the use of empowerment that gets others to lead themselves |

Source: Palmer et al. (2000)

This argument is based on two theories; the first is behavioural complexity which suggests that an individual can exhibit a range of leadership behaviours. Secondly, is the behavioural differentiation which includes the extent to which the individual can enact these behaviours in response to the demands of a particular organisational situation, and not perform them when the situation does not call for them (Palmer et al., 2000).

However, Ghillyer (2009) and Griffith and Watson (2004) agree that many styles of leadership exist but suggest that depending on participation and sharing in decision making, leaders can be classified into three most basic and prevalent styles:

• Autocratic leadership: this style is not inclusive or consultative, the individual is very conscious of his or her position. All decisions are taken by the leader who also takes full responsibility for his decisions. Orders are issued to be carried out with no explanations given.

Hence, all subordinates must obey orders and directives without asking any questions. Here a manager retains as much power and decision-making authority as possible. The manager does not consult employees, nor are they allowed to give any input. The motivation environment is produced by creating a structured set of rewards and punishment;

• Democratic leadership: this style, on the other hand, is a very open and collegial style of running a team. Ideas move freely amongst the group and are discussed openly. Everyone is given a seat at the table, and discussion is relatively free-
flowing, it is participatory in nature with group members and the leader making decision together.

The democratic leadership style encourages people to share their ideas, and to bring new suggestions, then synthesizing all the available information into the best possible decision. The democratic leader must also be able to communicate that decision back to the group especially in cases where he was forced or required to make the decision.

Criticism and praise are given objectively. A feeling of responsibility is developed within the group and quality of work and productivity is high. This style of leadership offers a great deal of flexibility to adapt to better ways of doing things, and

- A laissez-faire leader: is passive; and concentrates on passing information to subordinates, allowing them to work on their own. The leader does not set goals for the group. The group has complete freedom to take decisions, plan and organise work and set goals and solve any problem that arises. Productivity and teamwork morale are generally low with group members having very little interest in work.

3.4.3.3 Contingency approach

Even as behavioural theories may help managers develop particular leadership behaviours, they do not offer assistance as to what constitutes effective leadership in different situations.

Accordingly, when researchers could not find a one size fit all leadership style in all situations it became necessary to have a leadership paradigm shift to contingency theory. The contingency approach leadership is based on the premise that environmental factors affect a leader's style and effectiveness. Therefore, effective and successful leadership depends on the relationship between organisational situations, level of group / employee maturity, the task, other environmental conditions and leadership styles (Achua et al., 2010; Bolden et al., 2003).
In other words, effective leaders should apply different leadership styles based on the aforementioned factors. Hence leaders are able to decide to place more or less emphasis on the task at hand or on the relationship with subordinates. This enables a relationship-motivated leadership style which relies on good personal relations and group participation to accomplish tasks. Table 3.3 below depicts the contingency approaches to influence based on leader approach adopted.

**Table 3.3: Contingency approaches to influence**

<table>
<thead>
<tr>
<th>Leadership approach</th>
<th>Characteristics of situation and nature of influence</th>
</tr>
</thead>
</table>
| **Strategic approach** | • formulation and implementation of long-term strategy is main task  
    • external orientation (to business situation)  
    • delegate work to employees with planning and analytical skills  
    • appropriate situation: high level of organisational complexity (e.g. technology, geography, structure); unstable environment; where large decisions are required |
| **Human assets approach** | • strategy formulation at business unit levels is main task  
    • nurturing and developing individuals using values and commitment  
    • employees committed to the ‘company way’ are most valued, mavericks are not valued  
    • appropriate situation: where success depends upon the talent of employees to defeat competition through the way they make decisions, interact, and design new products |
| **Expertise approach** | • creating competitive advantage by providing expertise (technology, competitor analysis) is main task  
    • focus on systems and procedures  
    • individuals selected and rewarded who are knowledgeable in area of expertise  
    • appropriate situation: where specific capabilities are viewing as the way to achieve success by differentiating the organisation from its competitors |
| **Box approach** | • creating consistent experience for both employees and customers is main task  
    • focus on control and monitoring devices (e.g. cultural or financial controls)  
    • seniority and internal promotion valued  
    • appropriate situation: highly regulated industries; industry where safety and reliability are important (e.g. banks, airlines) |
| **Change approach** | • continual reinvention of organisation is the most important task  
    • focus on process for achieving this – especially a variety of communication devices to help employees to embrace change  
    • values independent people who see opportunities to be seized |
Leaders who apply the contingency approach perform most effectively in modest control situation, which present mixed problems related to task, group members and authority (Dessler, 2004). The relationship-motivated leader enlists cooperation from the group by being sensitive, diplomatic and tactful. On the other hand, a task-motivated leader prefers clear guidelines and standardized or patterned work methods to complete successfully the task they have accepted. They tell their group exactly what to do and how to do it, and thus provide information and direction and market the vision and get the team on board (DuBrin, 2000).

They have strong task orientation and perform best in high-control or low-control situations. The high-control situations are those where managers get support from group members and the tasks are clearly specified (Fields, 2008). In addition, leaders have high authority, which enables them to use their powers of reward and punishment appropriately. Low-control situations are the opposite of high-control situations and are relatively difficult, challenging and straining. Consequently managers need to adapt different leadership styles as leadership success requires adapting leadership styles to meet the situations.

3.4.3.4 Integrative approach

This leadership approach attempts to combine the trait, behavioural and contingency theories to explain successfully influencing the leadership-follower relationship. It shows how effective leaders influence the behaviours of the followers. This approach identifies behaviours and traits that facilitate the leader’s effectiveness and explores why the same behaviour by the leaders may have a different effect on followers, depending on the situation (Dubrin, 2012).

3.5 Strategic HS&E management

An effective HS&E system provides mutual benefits, which extend from the H&S of the project workforce into the host communities. In June 2000, the Association of Oil
and Gas Producers (OGP) produced a document on strategic HS&E management for organisations in the oil and gas industry. The report describes a systematic process for integrating community HS&E into project planning and management. The strategy involves ensuring the OHS of the workforce and the support and promotion of enduring improvements in the HS&E of host communities. In other words, the HS&E of host communities where employees work and live is crucial for sustainable business and creates prospects for economic development.

The report emphasizes the need for active cooperation among MNOCs, local governments, and social agencies through consultations to plan actions that could achieve desired outcomes. The report suggests that the success of international activities, especially in developing countries, requires consideration of the HS&E needs of not only the workforce but also of host communities.

Suggesting that the strategic objective must demonstrate the organisation’s belief that both the workers’ HS&E, and that of the host community are important to the business, acknowledges the importance of a focus on HS&E, highlights the importance and relevance of achieving lasting improvement in early stakeholder involvement and partnership, and conveys a sense of commitment to achieve sustainable improvement in HS&E during and after project decommissioning.

The authors indicate that industry co-operation on HS&E is beneficial, not only to the social and economic sectors but also future economic development for industry and the targeted regions, while improving business practices.

3.6 Code of good practice
The requirements of the Construction (Design and Management) (CDM) regulations 1994, indicate that the development of a project and site-specific HS&E plan is a recognised part of good practice in HS&E management (Holt, 2005).

The purpose of creating the plan is to support the development of a healthy, safe, and sound working environment for all workers from management down the ladder, and to ensure a corporate culture which supports HS&E both at the office premises and on sites. The plan is designed to benefit all stakeholders, including third parties and projects under its HS&E requirements.
A series of benchmarks need to be established, because such benchmarks or examples of good practice are defined by comparison with the HS&E performance of other parts of the organisation or the international performance of the occupational group of the organisation (Holt, 2005).

According to Holt (2005), organisations require those systems of checks and balances, both inter and intra which ensure the discharge of responsibility to all stakeholders and act in a socially responsible way in all areas of business activities. These best practices must have proved to be of value over time and should be comparative with global standards. Holt (2005) further indicates that benchmarking against the world’s most successful companies is not for the spineless. A corporate minimum requirement must be set in order that all parts of the business can comply.

Holt (2005) suggests that for organisations to meet the challenges of global best operating practice the following factors must be applied to HS&E management:

- All work is conducted according to a managed design that has taken HS&E issues into account, not only as they affect the end user, but also those constructing and maintaining the structure, and the population of the surrounding communities;
- All work is adequately assessed and a risk management plan is in place to control significant hazards and their risks;
- All work is managed by staff with appropriate knowledge and training in HS&E issues;
- All work is carried out by contractors and their workers who are competent in HS&E matters as well as in their particular skills, who have been verified as competent and who have been given a job-specific induction to the work;
- All outsourced projects are executed by contractors and consultants who have made appropriate allowance in their tenders for necessary HS&E measures required by the demands of the contract;
- All site workers are given necessary information and training about possible hazards and risks, and the control measures used to remove or minimise them;
• Systems are in place to ensure work is coordinated between groups of workers and different contractors; and HS&E issues are discussed and solutions agreed upon prior to site mobilisation;
• Work is executed in compliance with national or local regulations, standards and guidelines where they exist and in accordance with international good practice where they do not;
• An HS&E plan that is project specific is in place before commencement of site work which includes details of the control methods applied to the hazards and risks and a comprehensive fire, emergency and environmental plan;
• The necessary software and technology required to monitor and follow trends, and
• A system of rewards for safe behaviour and compliance with the HS&E management system exists and unsafe behaviour is penalised or otherwise discouraged.

The project sponsor as the instigator of the project and source of funding has a major influence in what happens on site. According to Holt (2005), the initiator of the project is responsible for the appointment of a planning supervisor who should be competent and must have the requisite training, knowledge and skills to undertake the task.

3.7 HS&E training

HS&E training is a very important aspect of establishing a good HS&E culture (Hughes et al., 2007). However, Holt (2005) suggests that HS&E training is a means to an end and not an end in itself. Hence it is not enough to talk to workers on the need for HS&E, but workers must be made aware of what constitutes HS&E practice.

Smallwood and Haupt (2005) assert that “Awareness is a precondition for the development of an optimum HS&E culture, and HS&E education and training in turn, are a precondition for an appropriate degree of awareness relative to HS&E.” Hence, a culture of HS&E awareness stems from HS&E education and training.
Therefore, it is imperative for both managers and workers to undergo periodic HS&E training and education which should be designed to educate workers on what to do for theirs and others’ H&S and well-being, but there is a need to educate workers on statutory requirements (Hughes et al., 2007) since the knowledge of what constitutes healthy and safe based behaviour in a variety of different occupational situations is not inherited but must be acquired. They suggest that the several types of training necessary for employees include:

- Induction training which should always be provided to new employees, trainees, consultants and contractors. The training includes an introduction to the organisation’s HS&E policy; a brief summary of the HS&E management systems including the name of the employees HS&E representative and source of HS&E information, the employee’s responsibility for HS&E including any general HS&E rules, the accident reporting procedure of the organisation, and the location of all available first aid posts, fire and other emergency procedures including the location of the assembly point and the location of welfare, canteen and rest rooms;
- Job-specific training ensures that employees undertake their job in a safe manner. It involves a form of skills training and is often best done on the job. Employees must know the details of their safe system of work, safety and emergency and the correct use of personal protective equipment;
- Supervisory and management training must include all aspects of induction training and training on the legal requirements for HS&E management. This ensures everyone is kept informed on HS&E requirements, accident prevention techniques and changes in the law but encourages everyone to monitor HS&E standards during visits or tours of the organization, and
- Specialized training is required mainly for activities which are not necessarily related to any specific task or job such as fire prevention, first aid and statutory HS&E inspections.

These training sessions must be systematic and should be conducted using verbal, visual, graphic or written modes of communication, they make full use of skills available in training staff (Hughes et al., 2007). Such training ensures better HS&E performance, results in greater earnings and productivity, ease of mind and a sense of
security and contentment at work. It further excludes misfits and diminishes unrest. The training should be systematic because it must be coordinated with the personnel needs of the organisation. However, as HS&E professionals advocate for training programmes for workers, it should not be at the expense of ignoring other causative factors of injuries (Hughes et al., 2007).

Several problems arise due to poor communication and it is imperative for organisations to ensure the HS&E message is properly understood. Communication is very important in designing an adequate training programme because its basic function is to convey meanings (HSE, 2000).

Understanding is a critical factor in the communication process; HS&E communication should incorporate sincerity, authority, confidence, accuracy and humour. Organisations increasingly require supervisors and line managers to prepare and undertake short training sessions on HS&E issues for the teams (Raouf et al., 1994). Effective communication will ensure success and get appropriate messages across to employees.

Holt (2005) suggests that three conditions need to be present for any HS&E training to be successful, they include:

- Management cooperation – this will include supporting training by providing resources such as finance;
- Engage experts to conduct the training or arrange for workers to attend training in recognized institutions, and
- Management must set good examples and must be seen to engage in HS&E training and exhibit and practice healthy and safe behaviour.

Holt (2001) asserts the need for supervisory and general management training at all levels this is necessary to ensure that responsibilities are known and the organisation’s policy is carried out. Khadair, Shamsudin and Subramaniam (2011); Holt, (2005) report that research has indicated that factors which have contributed to management failure as a result of HS&E incidents include:
• Lack of awareness of HS&E management systems in use, including job requirements for HS&E;
• Failure to enforce H&S rules adequately or at all;
• Failure to perform or train workers adequately;
• Failure to inspect and correct unhealthy or unsafe conditions;
• Failure to promote H&S awareness by participating in discussions, motivating workers and setting example, and
• Ignorance of environmental requirements or opportunities for improvement of conditions.

All employers require access to competent advice on HS&E, in order to comply with their duties when managing for HS&E.

3.8 HIV and AIDS

HIV and AIDS are a rising menace in Nigeria, with an estimated 6% of the adult population living with either HIV infection or full blown AIDS (UNDP, 2006). Research suggests that the Niger Delta region has the highest prevalence rate of 5.8% in terms of infected persons, higher than the national average which is 5.5% (Ereghe et al., 2009; UNDP, 2006).

Some of the risk factors which have been noted for the soaring rate of the disease in the Niger Delta area include the influx of people to the area from all over the world as a result of oil activities, such as expatriate workers, local engineers / consultants, construction industries’ workers and contractors predominantly made up of men with easy money, some of whom work months on end on oil facilities located in remote and isolated areas within host communities, and when they move into these communities the women notwithstanding whether they are married or single become victims of their lust (Isoun, 2001).

Also, the State’s security agencies such as the police mobile unit posted to secure oil facilities, supernumerary policemen in the employment of the oil firms who are responsible for the security of the organisation, its employees and properties are most of them away from their families for months, weeks and even years as the case may
be, and have all contributed in making the region a beehive of activities ensuring high levels of teenage pregnancy, commercial sex activities and prostitution which encourages concurrent sexual partnerships / high-risk heterosexual contact with multiple partners (Izugbara and Otutubikey, 2005).

Added to this mix is the state’s deployment of a combination of military and police force units known as the joint task force (JTF) to provide security and maintain law and order in the volatile region as its response to the activities of restive youths who have become actively involved in militancy in the area, reigning terror, and violent attacks in the region (Shu, Agbon and Ojukwu, 2008).

With staggering high rates of HIV infection in security personnel in many countries and particularly in the Nigerian military where research conducted indicates that prevalence of HIV and AIDS among uniformed services is higher than in the general population (UNAID, 2003). Also to be taken into accounts are the incidences of internally displaced populations, rape, sexual violence, and sexual exploitation by armed soldiers who abuse their positions. Shu et al. (2008) and Isoun (2001) observed that these conflicts have left women and girls particularly vulnerable.

HIV and AIDS used to be considered purely an issue of public health, but in the past decade this viewpoint has changed due to concerns about the stigma associated with the disease and the soaring number of affected individuals. The discriminatory attitude of society to people affected by the disease and the task of providing support for the afflicted groups is seen as a human rights challenge.

Other factors include a high prevalence of other sexually transmitted infections (STIs), and prevailing traditional stigmatization of persons with HIV and AIDS. The infringement on human rights is compounded by the high potential of spreading HIV and AIDS. A weak public sector health care and education system and economic deprivation and cultural norms prevalent in the region all make it difficult for women
to obtain information about safe sex practices, or to insist on such practices with their partners (Izugbara et al., 2005).

3.8.1. The impact of HIV and AIDS on organisations

Concern regarding HIV and AIDS and its impact on organisations is now as widespread as the disease itself. Rau (2002) noted that the scourge is having overwhelming implications for economies and markets, with a devastating blow on security and prosperity worldwide. He asserts that the HIV and AIDS pandemic is the most devastating civic health catastrophe in the past six hundred years and the most crucial social challenge confronting mankind today.

Organisations today experience many challenges in the business environment and HIV and AIDS is one factor that every organisation must address seriously and incorporate into its management policy, planning and operations.

As noted by Rau (2002), HIV and AIDS are not just a public health issue, but also a workplace issue. The devastating effects of HIV and AIDS are present in countries of great oil and gas exploration importance not only in Africa, but also Russia, Central Asia, India and China. This has raised concerns about organisations’ complicity in the spread of the disease.

The nature of the oil and gas industry is such that infrastructures are built in isolated locations and this increases population mobility, the implication being the prevalence and spread of HIV and AIDS. As mentioned previously, oil workers and the high concentration of military and private security officers have created a market for commercial sex and this account for the high incidence of violence and abuse. The complexity of situations created by HIV and AIDS requires flexible responses. Furthermore, addressing HIV and AIDS is a task for all sectors of society (Rau 2002).

Rau (2002) posits that a workplace HIV and AIDS programme will not operate in isolation from government, local communities, other organisations or a variety of groups in civic society. Rather, it will be one of many contributors to an overall national effort to control the disease and its impact.
Nigeria’s oil and gas industry is one of the highest employers of labour, accounting for 80% of national revenues and 95% of foreign earnings (Ereghe et al., 2009). This makes it the powerhouse of Nigeria’s economy hence factors that threaten this sector simultaneously represent a threat to all sectors of the entire economy.

Krause (2004) notes that HIV and AIDS will have a far-reaching impact on social and economic life because of its tendency to destroy human lives, especially lives of people in the work force who provide skilled and unskilled labour to various sectors of a nation’s economy.

Krause (2004) and Rau (2002) consider that the two major areas which will have negative implications for organisations as a result of the HIV and AIDS scourge are profitability and productivity as depicted in Table 3.4 below.

**Table 3.4: HIV and AIDS impact on organisations**

<table>
<thead>
<tr>
<th>Reduced productivity due to</th>
<th>Increasing cost due to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illness</td>
<td>Life insurance, medical aid and pension</td>
</tr>
<tr>
<td>HIV and AIDS absenteeism</td>
<td>Death and funeral benefits</td>
</tr>
<tr>
<td>Early retirement</td>
<td>Training and recruitment</td>
</tr>
<tr>
<td>Compassionate leave</td>
<td>Administrative costs</td>
</tr>
<tr>
<td>Labour turnover</td>
<td></td>
</tr>
</tbody>
</table>

Source: Krause (2004)

According to Magwasa (2009) and Rau (2002), to minimise, monitor and manage the impact, spread and consequences of the disease organisations should adopt a comprehensive HIV and AIDS policy with the following elements:

- Establish a policy on HIV and AIDS, circulate it to all workers, make sure of its execution and ensure it is updated frequently;

- Disseminate current findings on HIV and AIDS, with regard to preventive measures / transmission methods, where to find and how to gather further information and services and continue organisational and union support for responsible sexual behaviour;
• Ensure that condoms are readily available and accessible within the business / office premises;

• Provide diagnosis and treatment of sexually transmitted diseases, in health centres within the organisation, in community clinics or in other centres where employees receive health care;

• Provide treatment for HIV and associated diseases, such as tuberculosis;

• Provide therapy and testing for HIV on a voluntary and confidential basis, with systems in place to offer support for employees and/or family members who are HIV-positive, and

• Arrange alleviation services designed to provide such follow-up activities as counselling, community support and home-based care.

Rau (2002) observes that organisations operate within the environment where parameters such as the economy, politics, family units and society greatly impact on workers’ sexual attitudes; consequently, modalities introduced to help prevent the spread of the disease must be within the existing context. Therefore, it will take a collective effort by all stakeholders to tackle the support for the community HIV and AIDS effort. Organisations can add a helping hand monetarily or in kind by donating to support community prevention and care programmes, incentives for workers’ inducement to carry out related work in host communities.

Rau (2002) concludes that workers can have a great impact in community prevention, through passing down knowledge and information received from training classes arranged by their organisations and this can trickle down through to communities. Organisations can also encourage employers to provide information to communities.

3.8.2 Impact of oil extraction

In 2009 Amnesty International (AI), reported that the majority of the people living in the Niger Delta depend on the surrounding water and land for survival. Their source of livelihood is from fishing, carving, logging, and subsistence farming. Hence any
form of pollution to the immediate environment becomes a threat to the survival of the people as a result of potential damage to the vital resource base on which people depend to gain a living and will therefore reduce the standard of living of the people. Figure 3.5 depicts the Nigeria Niger Delta region.

**Figure 3.5 Map showing states that make up the Niger Delta region**

![Map of Nigeria Niger Delta region](image)

Source: Ojakorotu (2006a)

Crude oil exploration activities have been a source of concern for years. Undeniably, in the vanguard of challenges confronting management in the twenty-first century is the pursuit of sustainable development and the requirement to make societies, economies and systems of consumption and production more environmentally, socially and economically sustainable (Peattie, 2008).

Awareness of the importance of environmental issues has become more and more central to the thinking of the oil industry and regulators in the past decades. Exploitation of oil and gas reserves has not always been without some ecological side effects. Oil spills, desertification and loss of arable land, deforestation, accidents and fires and incidents of air and water pollution and other harmful environmental practices which have contributed immensely to the disruption of the ecosystem, have been recorded at various times and places. Added to this mix in Nigeria is a high rate of disease, and physical, mental and social ill-health (AI, 2009).

According to AI (2009), the effect of the activities of oil companies on the environment in the Niger Delta region occurs in a milieu where the livelihoods,
physical condition / health and access to food and uncontaminated water of millions of people are directly correlated to the land and environmental quality. With few alternative sources of livelihood and few social safety nets, people cannot find alternatives for lost income. The lack of adequate clean-up and remediation of the land, as well as the failure to assess and address the possible longer-term effects on agricultural land, crop productivity and food safety, food security, has produced an even more precarious situation (AI, 2009).

There is a major distinction between a once-off episode of pollution or ecological damage, and recurrent or continual incidents within the same vicinity over a period of time. AI (2009) and Azaiki (2006) report that research indicates that the irrigation structure and the rivers, streams and ponds in the Niger Delta region have, for decades, been bearing the brunt of oil spills and waste discharge, including waste water and dumped drilling waste. Rivers and creeks have also been subjected to dredging and canalization. It was observed that the region’s waterways have been extensively impaired by the collective and recurring implications of negative operational practices by oil exploration organisations. Added to this is the result of deliberate acts by host communities.

Despite the widespread pollution of the rivers and creeks of the region by oil spills and waste, AI (2009) report that there is no data of any study of oil pollution in water that is used for drinking, bathing and other domestic purposes that considered the implications on human beings in the area. The AI (2009) study in the area indicates that information from communities affected by oil spill incidents suggests a high level of respiratory problems and complaints of numerous symptoms. The aftermath of oil leakages which lead to pipeline explosions is usually caused by delay in remedial actions by MNOCs and relevant government agencies.

### 3.9 Ecological / physical environment

Organisations acquire all necessary raw materials from the physical environment, which also serves as the dumping ground for various types of waste and pollutants, by-products from the production of goods and services from manufacturing, construction, petroleum and other sectors of the economy.
The impact of societal activities on the environment has brought to the fore the issue of the quality of the environment. Increasing awareness of global warming is ensuring that governments are reviewing environmental laws to ensure sustainable development (Peattie, 2008). Global warming is a reality that affects the way society lives and changes it. The fear of climate change is putting pressure on the energy sector to move away from carbon burning to nuclear, solar and other environmentally friendly energy sources.

Global climate change caused by human combustion of fossil fuels and the resulting emission of greenhouse gases (GHGs) along with energy security is widely viewed as a critical global issue with a range of potential effects on human health, community infrastructure, ecosystems, agriculture and economic activity (Goodstein, 2008).

The resulting implication for organisations is a growing consciousness of the physical environment and interfaces that present opportunities as well as threats to operations amongst which are shortages of resources, fluctuating cost of energy, cost of pollution and its resultant remediation and damages to a country’s bio-diversity and natural resources.

Concerns about the environment are forcing organisations to look at how their actions affect the quality of the air, land, and water (Ghillyer, 2009). This is evident in Nigeria’s petroleum industry. The need for the petroleum and construction sectors in Nigeria to begin to promote more sustainable operations / activities cannot be over-emphasised.

Peattie (2008) suggests that in the past ecological issues were important for a relatively small selection of organisations in industries such as the petroleum, chemicals, and automotive, where they were mostly treated as operational matters concerning compliance and regulations. However, this scenario began to change by the early 1990s mainly because according to Peattie (2008), ecological and social issues had become part of the strategic agenda of a wide range of organisations for reasons which include:
Instances of environmental pollution such as gas flaring, oil spillage, chemical and radiation leaks revealed that poor environmental performance generate risks that may possibly jeopardise an organisation’s existence;

Impact of organisation activities relative to the environment became a key concern with investors, civil society, communities and insurers. This generated an interest in the environmental performance of organisations particularly in sensitive industries as a result of the risk involved since expert handling of environmental and social issues and risks also became increasingly used as proxy measure for a professional approach to management;

Civil society concerns about ecological issues were generating new environmental and socially oriented market opportunities through demand for environmentally friendly practices and products such as organic foods, natural cleaning products, and fairly traded coffees. This demand was reflected in, and often stimulated by, the development of many new niche organisations and brands, and

Research findings indicated a growing concern by workers about the environmental and social performance of organisations, and fresh graduates and many highly-skilled workers were increasingly taking these factors into account in their career development decisions.

Krause (2001) considers that contemporary organisations contribute to the preservation of the environment through standards and ensuring their processes include managing, measuring, improving and communicating the environmental aspects of operations such that they minimise pollution in liquid, solid and gaseous forms; emission of toxic and harmful substances, organic waste, noise, community concerns, flora and fauna, habitats, and H&S concerns.

Moreover, the refusal of organisations to encourage the preservation of the environment through an environmental policy will result in contributing to hastening and compounding environmental problems such as global warming, acid rain, air and water pollution, noise, erosion, deforestation, industrial effluents, gas flaring and major spills.
De Bakker and Den Hond (2008) and Krause (2004) advise that organisations must at all costs avoid conflict with environmentalists and civil society; management should be environment conscious and must act responsibly in environmental issues. Krause (2004) concludes that modern organisations should integrate a corporate environmental policy into their strategy for implementing an Environmental Management System (EMS). The policy must cover the organisation’s interests and should focus on scope of responsibility, product management, commitment and communication, energy and resource management and environmental protection and enhancement.

3.9.1 Pollution
By far the most significant problem in Nigeria in the twenty-first century measured by its human, socio-economic, ecological and physical impacts, is that of concentrated oil and gas pollution in the highly sensitive ecological and aquatic environment of the Niger Delta and other parts of the coastal zone and offshore area (Azaiki, 2006; Ajaikaiye, 2008).

Section 37 of the National Environmental Standards and Regulations Enforcement Agency Establishment Act 2007 defines ‘pollution’ thus:

“Pollution means man-made or man aided alterations of chemical, physical or biological quality of the environment to the extent that is detrimental to that environment or beyond acceptable limits and pollutant shall be construed accordingly.”

Goodstein (2005) claims that zero pollution is unachievable and should not be desired either, because pollution is a by-product of living. He suggests rather that concern should be focused on the level at which the benefits of pollution are outweighed by its cost. The cost may prove difficult to measure. However, it can be viewed from various perceptions which include; economic, ethical considerations, such as fairness and the protection of rights. Whichever side the coin drops, it is imperative to weigh the benefits and cost in order to ascertain how much is too much nonetheless remembering that H&S requires reduction to socially defined safe levels, unless the costs of doing so are unreasonable.
Most of the pollution from the oil and gas industry occurs as either atmospheric pollution or land and water pollution. This occurs whenever potentially harmful substances are released into the environment principally through human activities, though it can also be a natural process.

Goodstein (2005) reports that depending on the receiving agents, pollution is categorised into three major principal conditions which could be, air as emissions which causes air pollution, water as effluent which causes water pollution, and noise pollution.

Goodstein (2005) further indicates that environmental or air pollution arises from various causes, one of which is fossil fuel. A by-product of crude oil exploration, formed when dead plants and animals decompose and are broken down into liquids such as oil, gases such as natural gas and solids such as coal and peat.

When fossil fuel is burnt during oil exploration activities or from thermal power stations, the long-stored sulphur is released as sulphur dioxide. Harmful pollutants such as sulphur dioxide, nitrogen oxide, and carbon (iv) oxide, when emitted into the atmosphere, can cause acid-rain, global warming and malfunctioning of human / animals haemoglobin (Pyagbara, 2007).

Pyagbara (2007) suggests that the sulphur content of oil varies from place to place depending on geographical sources. Crude oil has anything from 0.1 to 3% sulphur content. The degradation of the ecosystem in an oil production zone sets in motion accelerated emission of hydrogen sulphur which emits atmospheric sulphur, a major source of pollution. Major sources of oil pollution include oil spills, gas flares, effluent and waste discharges.

### 3.9.1.1 Atmospheric pollution

When substances which are harmful to human health, human welfare or the environment are found at particular concentrations, durations and frequencies in the atmosphere, that atmosphere is considered polluted (Mcgranahan and Murray, 2003). These authors indicated that for a long time unhealthy air was suspected to be the cause of diseases well before the relationship could be scientifically confirmed.
So industrialisation heightens the necessity for a logical documentation of the local impact of atmospheric pollution on human health and the environment. Mcgranahan et al., (2003) report that foreign substances have always been present in the air, and when there is an excessive concentration of foreign matter in the atmosphere which is harmful to the environment then the air is said to be polluted. Waste from crude oil exploration and production is a major source of air pollution in Nigeria. When one or more contaminants are present in the atmosphere in huge quantities, their features and duration make them potentially injurious to society, plant and animal life, or they may unreasonably interfere with the comfortable pleasure of life and property (Mcgranahan et al., 2003).

Artificial sources of air pollution include emission of gases and particles. In attempting to control atmospheric pollution, many cities adapted methods which were centred on the obvious and noticeable immediate pollution, such as the particulate and sulphur dioxide concentrations in cities.

According to Mcgranahan et al. (2003), the measures adopted include the location of gas plants, oil wells, and manufacturing and production industries far from communities. Also major emission sources were required to discharge from high chimneys to diffuse the emissions hence lowering ground level concentrations. These measures resulted in regional pollution as emissions from industrial areas are able to move extensively through the atmosphere and over national borders while polluting the environment and people’s health in both rural and urban communities in other countries (Mcgranahan et al., 2003).

### 3.9.2 Gas flaring

As mentioned previously, air / atmospheric pollution, global warming and ozone depletion are transforming the earth’s climate and atmosphere and are among the most far-reaching environmental problems society faces today.

Associated natural gas occurs in association with crude oil and is harnessed along with the oil. This gas is separated to make the crude oil useful and valuable. Oil
companies in Nigeria burn off this associated gas into the atmosphere and flare it from the oil fields and flow stations located within operational bases (Pyagbara, 2007).

Malumfashi (2007) citing a World Bank (WB) sponsored report rates Nigeria, Iraq, Iran and Russia as accounting for more than 95% of gas flaring and venting in the world. The report estimates that the annual volume of natural gas being flared and vented worldwide stands at about 110 billion cubic metres (bcm), enough to provide for the annual gas consumption of Central and South America, or that of Germany and Italy (Malumfashi, 2007).

Bassey (2008) reports that research has indicated that 168 billion cubic metres of natural gas is flared yearly worldwide, this is equivalent to 25% of gas consumption in the USA and 30% of EU gas consumption. The flared gas releases 400 million tons of carbon dioxide annually into the environment. The World Bank report further indicated that the gas flared annually in Africa stands at 37 bcm and could produce 200 terawatt-hours of electricity, which is about half the power consumption of the continent and more than twice that of Sub-Saharan Africa excluding South Africa.

Since MNOCs and the Nigerian government have been exploring oil in commercial quantity for over 50 years in Nigeria, this implies that indiscriminate flaring of associated gas has been occurring in Nigeria since the early 1960s in the Niger Delta and offshore (NNPC, 2004). Furthermore, since approximately 275 flow stations exist within the oil producing communities and offshore then it implies that each have been flaring associated gas since inception for decades (Egberongbe, Nwilo, and Badejo, 2006).

Statistics are conflicting with respect to the amount of associated gas flared in Nigeria annually, but according to Bassey (2008), the US National Geophysical Data Centre reports that, Nigeria is responsible for 13% or 23 billion cubic metres (bcm) of gas flared in the world annually. This is the highest quantity of any country in the world and makes Nigeria one of the main sources of CO₂ emissions in Sub-Saharan Africa (Bassey, 2008; Pyagbara, 2007; Kupolokun, 2006).
Also, Osuoka and Roderick (2005), estimate the amount of associated gas flared at 25 bcm. Christinsen and Haugland (2001) suggest that Nigeria flares about 20 bcm annually, and is the seventh largest gas reserve country in the world. Despite the conflicting records on the amount of gas flared in the country one fact is certain, Nigeria is noted as the world’s worst in gas flaring.

This gas is mostly flared vertically into the atmosphere from a high stack. In the Niger Delta the gas flared is flared both horizontally and vertically, vertically from high stacks and horizontally at ground level (Pyagbara, 2007).

The flares raise the temperature of the surrounding environment to temperatures beyond normal of 13-14 000 degrees Celsius and causing noise pollution around the vicinity of the flares. Another problem associated with gas flaring is ‘light pollution’. Light pollution subjects the living organisms around the vicinity of the flare to 24-hour daylight (Pyagbara, 2007).

Some of the flares at ground level are pointed menacingly at communities and agricultural land, belching heat and smoke from their wasteful infernos, constant loud roars accompany the thick columns of smoke emanating from the flares (Okonta and Douglas, 2003). Some of the community settlements are located less than 250 metres away. They have been in existence long before the oil companies began operations (Okonta et al., 2003).

In the past two decades the Nigerian oil and gas industry has commenced the gas utilisation project. Kupolokun (2006) asserts that since the gas utilisation project began in Nigeria, there has been a huge reduction in the quantity of gas flared.

A multi-decade legacy of flaring has been a flashpoint for conflict in the Niger Delta region. Repeated postponements of government deadlines, the most recent in 2008, for a phase out of gas flaring, have diminished expectations for a lasting solution. The challenge in Nigeria, and in other parts of West Africa, is to enact effective policies that simultaneously build a dynamic energy sector, foster local economic development, improve security, and enhance government commitment to regulation, enforcement and ensure compliance with international standards.
All of these must happen while designing for and developing new infrastructure to connect dispersed sites. In this region, external financing solutions, expansion of public-private partnerships and political will to advance policy reform will be critical to drive flare reductions.

3.9.2.1 Environmental impact of gas flaring

Christiansen *et al.* (2001) point out that the environmental effects of flaring have global regional and local impacts. The global environmental impact is as a result of the burning of associated or solution gas, which emits carbon dioxide and methane, substances that increase the concentration of greenhouse gases (GHG) in the atmosphere, and in turn contribute to global warming (Bassey, 2008).

As mentioned previously, regionally and locally gas flaring contributes to environmental problems, such as acid rain, acid precipitation, and heat stress which have an impact on agriculture, forests resources, fishing, human health, and other physical infrastructure (Bassey, 2008).

Gas flaring emits a cocktail of benzene and other toxic substances that are harmful to humans, animals, plants and the entire physical environment. Furthermore, large amounts of methane accompanied by the other major GHG such as CO₂ have a very high global warming potential. The flares contain a melange of toxins that affect the wellbeing, physical condition and livelihood of local communities (Environmental Rights Action, 2005; Ibeanu, 2000b). Environmental Rights Action (ERA) further claims that gas flares have been identified as the cause of acid rains that pollute creeks and streams and damage vegetation and corrode roofs of houses.

Bassey (2008) reports that the impact of climate change is distinct on low-lying coastal areas such as the Niger Delta, which is prone to freak weather events, flooding, and coastal attrition and usually the first to be affected by sea level rise. Due to raised temperatures, climate change favours the rise of pests and spread of diseases. This has made the flaring of associated gas undoubtedly a major environmental concern for the oil and gas industry in Nigeria.
3.9.2.2 Economic impact of gas flaring

Christiansen et al. (2001) describe gas flaring as the wasteful emission of GHG that results in global warming, and is a waste of a resource with potentially high economic value hence Nigeria is suffering from a resource management problem. They argue that for a region facing severe power issues due to deteriorating supply capacity in numerous energy sub-sectors and a power sector, persistently plagued by shortages of generation capacity and recurrent power outages caused by dwindling infrastructure ensuing major economic losses and human hardship, it is inexcusable for the state to allow gas flaring for this long.

However, Clark, Greeno, Livoti, Turner, Quarto, Richard, Tate, Wilson and Wysham (1999) indicate that the economics of utilisation of associated gas is capital intensive costing over ten time’s more than non-associated gas and re-injection. Therefore, to utilize non-associated gas or re-injection is a lot more expensive than flaring hence the oil companies prefer flaring which provides the cheaper option. Nonetheless, they suggest that it is more advantageous for Nigeria to utilize its associated gas because of the new status of gas in the global energy security debate.

Christiansen et al. (2001) assert that Nigeria is losing a significant income from gas sales. The country’s estimated 3.5 trillion standard cubic metres (sm$^3$) which is equivalent to 124 trillion cubic feet of proven gas reserve, constitute the tenth largest gas reserves in the world and is twice the country’s crude oil reserve in terms of energy content. Others have estimated an average of 2.5 billion dollars is lost annually to gas flaring. Bassey (2008) estimates the annual loss of income from gas by Nigeria at between 500 million and 2.5 billion dollars.

The volume of gas flared is capable of generating up to 6 GW of electric power annually (Christiansen et al., 2001). Hence the country could have earned as much as twelve billion dollars annually from natural gas exports alone by 2009, the date set for when the projects designed to end the burning of gas associated with oil extraction would have been on stream. A tall dream because as at the year 2012 indiscriminate flaring of associated gas is still prevalent in many areas in the region.
Bassey (2008) reports that with the continuing degradation of the Niger Delta, environmental projections have shown that the region will lose 50% of its ability to produce cereals by the year 2020, and this figure will rise to 80% by the year 2050.

### 3.9.2.3 Health impact of gas flaring

As mentioned previously, gas flaring in the Niger Delta region has deprived host communities of the comfort of night’s natural darkness (Ugochukwu, 2008; Clark et al., 1999). According to Clark et al. (1999), the impact of gas flaring on the people’s health has not been fully assessed, but it is evident in the region. They report that it was not possible to access some communities during a visit to the region because of the intensity of the heat; they heard loud roars accompanied by thick smoke and a foul smell in the air emanating from gas flairs and gas leakages. They indicate that acid rain as a result of gas flaring is depriving host communities of drinkable water and is stunting the growth of crops.

Bassey (2008) and Shu et al. (2008) report that some of the diseases which are predominant in the region could be attributed to the effect of environmental pollution, diseases such as serious respiratory problems including asthma, bronchitis, coughing up blood, skin rashes, skin diseases, tumours, gastrointestinal problems, cancers of different forms.

Specifically, Bassey (2008) states that life expectancy in the Niger Delta stands at 40 years on average, and this can be attributed to toxic elements such as benzene being released regularly into the atmosphere. Ojakorotu et al. (2006) indicate that gas flaring has dying consequences for both human and wild life, oil company workers are usually accommodated in camps within site location during project activities and host communities and the general public are all directly exposed to such pollution.

### 3.9.3 Pipeline leakages and damage

Another major challenge facing oil and gas operations in Nigeria is the pollution of land and water resulting from pipeline leakages / damage. As mentioned previously Nigeria has a total network of about 7 000 kilometres of oil pipelines (Evoh, 2009).
This pipeline transports crude oil to the point of loading unto tankers or refineries. The network of oil pipelines across the country connects 22 petroleum storage depots strategically located in different parts of the country.

Some of these pipelines are exposed as a result of erosion or because they were not properly buried deep at the required depth of one metre beneath the surface along a 25-metre wide ‘right of way’ (AI, 2009). Unfortunately, according to Evoh (2009) in Nigeria the reverse is the case, people are buried by pipelines as opposed to pipelines being buried by people.

Various factors contribute to pipeline damage and subsequent explosions in Nigeria, some of which include blow out of pipelines / flow lines as a result of wear and tear, aged pipes with material defects and pipe corrosion which are not replaced in due time after being operated for several years, another factor is poor maintenance as a result of non-performance of non-destructive tests (Evoh, 2009). The resultant effect of all of these factors is oil leakage / oil spill and subsequently explosion which often results in fire outbreaks, loss of farmland and human lives (Ojakorotu et al., 2006).

According to Olojede, Fajonyomi, Akhape and Mudashiru, (2000), from the late 1990s another mix was added to the cause of pipeline damage, namely, acts of sabotage by two categories of people, which include disgruntled community members who vandalise oil pipelines in order to make monetary demands on MNOCs or to obstruct and disrupt oil production and distribution, and the activities of militia groups who are involved in oil theft such as oil bunkering for economic benefits. Figure 3.6 depicts a hose used by militia groups to siphon oil from pipelines into vessels.
Evoh (2009) reports that in 1999 alone, Nigeria experienced 524 cases of pipeline rupture, 27 of which were due to wear and tear, and 497 were due to vandalism. In 2008 Nigeria recorded 2,218 incidents of line breaks as a result of vandalism (NNPC, 2008). Despite security measures introduced to protect oil and gas facilities, regrettably, cases of pipeline explosion are on the rise.

Unfortunately, the victim of the struggle for the control of crude oil in Nigeria is the natural environment, oil and gas company workers, consultants and contractors who have to work on polluted sites to remedy the situation, and impoverished Nigerians, who venture to make a living off this chaotic situation.

This is reflecting the social and economic malaise facing the nation (Evoh, 2009). Evoh (2009) blames this trend on the way pipelines are laid within communities in Nigeria. He argues that the oil industry does not adopt international standards when laying pipelines in the Niger Delta region. The proximity of pipelines to community residences is depicted in Figure 3.7 below.
It is obvious that pipeline vandalism is multifaceted and people engage in it for reasons which include economic, opportunism, international / local organised crime, psychological, and for compensation. Table 3.5 below presents a list of some major pipeline leakage explosions which have occurred in Nigeria.

**Table 3.5: Major pipeline leakage explosions in Nigeria**

<table>
<thead>
<tr>
<th>Date</th>
<th>Incident</th>
<th>Location</th>
<th>Casuality</th>
</tr>
</thead>
<tbody>
<tr>
<td>17/10/1998</td>
<td>Leak on a petroleum pipeline, which exploded while people were scuffling to collect ‘free’ oil</td>
<td>Jesse, Delta state</td>
<td>200 villagers died</td>
</tr>
<tr>
<td>10/07/2000</td>
<td>Leaking petrol pipe manifold exploded</td>
<td>Jesse, Delta State</td>
<td>250 people died</td>
</tr>
<tr>
<td>16/10/2000</td>
<td>Scuffling to collect ‘free’ oil when it exploded</td>
<td>Warri, Delta State</td>
<td>100 people</td>
</tr>
<tr>
<td>30/11/2000</td>
<td>Leaking pipeline caught fire near the fishing village</td>
<td>Ebute, Lagos State</td>
<td>60 people died</td>
</tr>
<tr>
<td>24/06/2001</td>
<td>Pipeline rupture – spilled oil moved through the water system and contaminated the water supply of many communities’. The oil subsequently caught fire and days after the incident petrol fumes were intense, making breathing difficult</td>
<td>Ogbodo, Rivers State</td>
<td>42 communities were affected</td>
</tr>
<tr>
<td>19/07/2003</td>
<td>Vandals punctured a pipeline which exploded</td>
<td>Umahia, Aba State</td>
<td>125 people died</td>
</tr>
<tr>
<td>12/05/2006</td>
<td>Pipeline inferno between Snake island and Atlas Cove petrol depot</td>
<td>Lagos state</td>
<td>200 people died</td>
</tr>
<tr>
<td>16/05/2008</td>
<td>A bulldozer struck an oil pipeline</td>
<td>Ijegun,</td>
<td>More than 15</td>
</tr>
</tbody>
</table>
While the Anti-sabotage Decree of 1975 prescribes the death penalty for persons apprehended for tampering with or damaging oil pipelines (Omoweh, 2005), the Act further provides that an armed patrol may arrest / detain without warrant persons reasonably suspected of committing an offence under the Act. The inability of authorities to persecute anyone under these laws is a clear indication that the laws are not being applied in practice.

### 3.9.3.1 Oil spill

Oil spill represents one of the most serious forms of water and land pollution and has most often been associated with losses of crude oil or petroleum into the land and marine environment, often poisoning drinking water and destroying vegetation. It can occur during the discharge from transporting vessels of ballast and bilge and storage facilities; ground erosion, tectonic movements on the sea bottom and contact with ship anchors and bottom trawls, it can also result from oil well leakage, facility or equipment failure. Also, it is presently rife in Nigeria where it occurs from pipeline vandalism, sabotage and oil bunkering activities. Figure 3.8 below depicts engineers from an oil company working on vandalised oil pipelines.

**Figure 3.8: Engineers repairing a vandalized oil pipeline at Ahoada West in River State**

Source: Author (2010)
Research findings suggest that defective technology, poor tanker loading control systems as a result of non-conformance with HS&E practice by erring companies are contributing factors to oil spills in Nigeria (Eyo-Essien, 2008). Coupled with these factors are criminal elements involved in sabotage (Eyo-Essien, 2008).

NNPC (2009) categorises oil spillage into minor, medium, major and disaster categories. A minor spill occurs when the oil discharged is less than 25 barrels in inland waters or less than 250 barrels on land, or offshore or coastal waters that do not pose a threat to public health or welfare. Medium spills are those that are 250 barrels or less in the inland water or 250 to 2599 barrels on land, or offshore and coastal waters, while for the major spill, the discharge to the inland waters is in excess of 250 barrels on land, offshore or coastal waters.

In addition, a disaster refers to any uncontrolled cases of well blowouts, pipeline rupture or storage tank failure which pose an imminent threat to public health or welfare (Egberongbe et al., 2006). Oil spill disasters are not peculiar to Nigeria. The difference is that, in other parts of the world where spill occur, they are addressed effectively and efficiently.

3.9.3.2 Impact of oil spill on the environment

The devastating impact of oil spills in oil producing communities is well-documented by UNDP (2006); HRW (2007); and ANEEJ (2004). When oil spills either deliberately or accidentally, it speedily covers a vast area of the sea, forming a giant oil slick. High winds, ocean currents, tides and rough seas can push the slick onto nearby shores, covering rock and sandy beaches in thick black oil, and causing serious harm to wildlife. Figure 3.9 below depicts a site polluted as a result of oil spillage in Rivers State.
Oil spilled at sea normally breaks up and is dissipated as a result of some chemical and physical processes such as weathering and is scattered into the marine environment over time and can pollute thousands of kilometres of coastline. Spilled oil forms a greasy layer on the water’s surface and blocks out vital supplies of light and air from the marine life in the water beneath, killing marine animals such as fishes, crabs, and other crustaceans. It poisons algae, disrupts major food chains and decreases the yield of edible crustaceans (Sunmonu, and Oloyede, 2007).

According to Pyagbara (2007) oil on the water surface interferes with gaseous interchange at the sea surface and thus lowers dissolved oxygen levels. When oil spills occur in coastal areas they endanger fish hatcheries and contaminate the flesh of commercially valuable fish, and prevent sunlight from reaching deeper levels of water where corals thrive, thus limiting food production of plants (photosynthesis). Spilled oil disturbs the ecosystem of coral reefs and mangroves (Pyagbara, 2007). Figure 3.10 depicts the impact of an oil spill on a stream in a community.
Nwafor (2006) agrees that locally, oil and gas activities have been associated with environmental impacts which are visible, intense and cumulative. He contended that the magnitude of the adverse social and environmental impacts is closely related to the nature of oil and gas prospecting and exploitation, with its massive need for land disturbance, removal of vegetation and environmental degradation on a scale frequently beyond the imagination of those in the affected communities.

A preliminary survey by Akoroda (2000) revealed that an emergent trend of carcinogenic diseases in the Niger Delta is traceable to the exposure of host communities to the radioactive elements of gas flaring. Akoroda (2009) indicates that the people in the communities he observed showed the development of symptoms of bronchial and respiratory diseases, which are effects of long exposure to gas flaring. MNOCs indicated that sabotage accounts for a greater percentage of all oil spilled at their facilities in Nigeria, and that the percentage has increased since the early 1990s as a result of an increase in the incidence of oil bunkering (HRW, 2007): an interesting phenomenon considering that in accordance with Nigerian law, when an oil spill occurs and is determined to be as a result of sabotage, oil companies are not
obliged to pay compensation for such spills in the hope that this will act as a deterrent to persons with such motives, and help safe-guard oil installations and the environment. Figure 3.11 below depicts the effect of a fire outbreak on a community site as a result of oil spillage in January 2011.

**Figure 3.11: Emago-Kugbo, Edema and Otuabagi, oil spill resulting in fire incident**

Source: ANEEJ (2010)

It is imperative to point out that the effects of oil spills on the environment are made worse by delays in cleaning-up. As a result, MNOC’s employees and contractors have problems accessing sites for investigation or clean up. If security providers are brought in to provide access to such areas, it further feeds into community grievances against the MNOCs (AI, 2009).

Understandably so, since the process of determining the cause of spills is often linked to payment of compensation and appointment of clean-up contractors, who could be the company or the community, hence conflict often erupts in this process. The stakes are raised transforming oil spills from an environmental issue into a political issue. This leads to opposing positions rather than a focus on shared interests.

### 3.9.3.3 Oil spill statistics

Various statistics exist on the extent of oil spilled at different times in Nigeria depending on the source. Table 3.6 below depicts cases of oil pipeline vandalism which resulted in oil spills in the Niger Delta region.
Table 3.6: Oil pipeline vandalism in the Niger Delta region, 1993-2006

<table>
<thead>
<tr>
<th>Year</th>
<th>Cases of vandalism (No.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>7</td>
</tr>
<tr>
<td>1994</td>
<td>8</td>
</tr>
<tr>
<td>1995</td>
<td>7</td>
</tr>
<tr>
<td>1996</td>
<td>33</td>
</tr>
<tr>
<td>1997</td>
<td>34</td>
</tr>
<tr>
<td>1998</td>
<td>57</td>
</tr>
<tr>
<td>1999</td>
<td>497</td>
</tr>
<tr>
<td>2000</td>
<td>600</td>
</tr>
<tr>
<td>2001</td>
<td>703</td>
</tr>
<tr>
<td>2002</td>
<td>726</td>
</tr>
<tr>
<td>2003</td>
<td>813</td>
</tr>
<tr>
<td>2004</td>
<td>1,170</td>
</tr>
<tr>
<td>2005</td>
<td>2,237</td>
</tr>
<tr>
<td>2006</td>
<td>3,243</td>
</tr>
</tbody>
</table>

Source: Omojimite (2012)

The NNPC (2004) reports that 4,835 incidents of spills were recorded between 1976 and 1996 in Nigeria, which translates into approximately 2,369,470 barrels of oil lost, out of which 1,820,410.5 barrels were lost to the environment. It is important to note the surge in oil pipe line vandalism from 1999 when a new democratic government took over governance.

The UNDP indicates that over 6,800 oil spill incidents occurred between 1976 to 2001, resulting in a total loss of approximately three million barrels of oil (AI, 2009). Egberonge et al. (2006) report that approximately, 6% of the total oil spills between 1976 and 1996 occurred on land. Figure 3.11 depicts an area of farmland affected by oil spillage from an oil well.
Figure 3.12: Farmland affected by oil spillage from an oil well head

Source: Ajakaiye (2008)

25% of the incidents were in swamps and 69% were offshore. Table 3.7 depicts a list of oil spill disasters and the attendant ecological impact.

Table 3.7: List of oil spill disasters and attendant ecological impact in the Niger Delta

<table>
<thead>
<tr>
<th>Location</th>
<th>Environment</th>
<th>State</th>
<th>No of sites impacted</th>
<th>Nature of pollution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biseni</td>
<td>Freshwater swamp</td>
<td>Bayelsa</td>
<td>20</td>
<td>Oil spillage</td>
</tr>
<tr>
<td></td>
<td>forest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Etiema / Nembe</td>
<td>Freshwater swamp</td>
<td>Bayelsa</td>
<td>20</td>
<td>Oil spillage &amp; fire outbreak</td>
</tr>
<tr>
<td></td>
<td>forest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Etelebu</td>
<td>Freshwater swamp</td>
<td>Bayelsa</td>
<td>30</td>
<td>Oil spillage</td>
</tr>
<tr>
<td></td>
<td>forest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peremabiri</td>
<td>Freshwater swamp</td>
<td>Bayelsa</td>
<td>30</td>
<td>Oil spillage</td>
</tr>
<tr>
<td></td>
<td>forest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adebawa</td>
<td>Freshwater swamp</td>
<td>Bayelsa</td>
<td>10</td>
<td>Oil spillage</td>
</tr>
<tr>
<td></td>
<td>forest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diebu</td>
<td>Freshwater swamp</td>
<td>Bayelsa</td>
<td>20</td>
<td>Oil spillage</td>
</tr>
<tr>
<td></td>
<td>forest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tebidaba</td>
<td>Freshwater swamp</td>
<td>Bayelsa</td>
<td>30</td>
<td>Oil spillage</td>
</tr>
<tr>
<td></td>
<td>forest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Environment</td>
<td>State</td>
<td>No of sites impacted</td>
<td>Nature of pollution</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------------</td>
<td>-------------</td>
<td>----------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Nembe Creek</td>
<td>Mangrove forest</td>
<td>Bayelsa</td>
<td>10</td>
<td>Oil spillage</td>
</tr>
<tr>
<td>Azuzuama</td>
<td>Mangrove forest</td>
<td>Bayelsa</td>
<td>50</td>
<td>Oil spillage</td>
</tr>
<tr>
<td>Jones creek</td>
<td>Mangrove forest</td>
<td>Delta</td>
<td>35</td>
<td>Spillage &amp; Burning</td>
</tr>
<tr>
<td>Opuekeba</td>
<td>Barrier forest island</td>
<td>Delta</td>
<td>50</td>
<td>Salt water intrusion</td>
</tr>
<tr>
<td>Ugbeji</td>
<td>Mangrove</td>
<td>Delta</td>
<td>2</td>
<td>Refinery wastes</td>
</tr>
<tr>
<td>Ughelli</td>
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</table>

Source: Allen (2008)

3.9.4 Effluent and waste discharges.

Another source of oil related pollution is the discharge of effluent into the surrounding environment, which could be on land or in water.

A common situation which occurs during exploration or seismic surveys by oil companies, is when drill cuttings, drilling mud, and fluids are used for stimulating production (Pyagbara, 2007). Pyagbara (2007) suggests that there is also the use of chemicals during seismic activities. The major constituents of drill cuttings such as
baryotes and bentonitic clays when dumped on the ground prevent local plant growth until natural processes develop new topsoil.

In the water, these materials are dispersed and sink and kill aquatic plants and animals. In addition to the pollutants introduced into the environment from exploration and exploitation operations, refinery wastes also have characteristics which constitute potential land, water and air pollutants. The disposal of waste into the sea from oil facilities has direct effects on both plants and animals (Pyagbara, 2007).

However, Nwagbaraocha (2011) opines that environmental trends for air / water quality, waste disposal are experiencing the fastest rate of improvement among the regulatory topics. Therefore African countries are likely to begin to strengthen environmental regulatory framework which will likely result in additional facility-level requirements, as well as potential fines, facility shutdowns, and clean-up costs for a noncompliant facilities.

3.10 Ownership of oil in Nigeria

The combination of the Constitutional Provisions on oil and gas, the Land Use Act (LUA) and aspects of the oil laws of Nigeria has given extensive powers to the Nigerian government to take possession of land for use by the oil industry without adequate or sufficient reparation.

The most crucial petroleum ownership / control legislation in Nigeria is the 1969 petroleum Act, which clearly and intricately defines the issues of petroleum resource ownership and control. This Act was originally known as decree 51 and it clearly defines who owns and controls petroleum resources in Nigeria. The Petroleum Act repealed two oil-related pieces of legislation; since Nigeria formally became a colony they included the mineral oils ordinance No 17 of 1914 and the mineral Act of 1945. The Mineral Oils Ordinance No 17 of 1914 conferred powers on the colonial administration to grant prospecting privileges which were not granted to the customary people as they were statutorily excluded from acquiring rights in the resources found in their land.
The law forbids non-British citizens or companies from participating in oil prospecting and exploration activities. While the Mineral Act of 1945 had vested ownership and control of oil in Nigeria in the British Crown, the Petroleum Act transferred the rights of ownership and control of oil to the Nigerian government and this is enshrined in section 44 (3) of the 1999 constitution of Nigeria, which stipulates that:

“The entire property in the control of all minerals, and mineral oil in, under or upon any lands in Nigeria, and of all rivers, stream and water courses throughout Nigeria and the exclusive economic zone of Nigeria shall vest in the state and shall be managed in such a manner as established by law.”

The Petroleum Act opened the way for the participation of Nigerian citizens and companies in the oil industry of the nation and gave the state the legal basis to promote an operating policy and fiscal environment that would best serve the developmental needs of the Nigerian society. Three types of interest are provided for grants by the Minister for petroleum resources by the petroleum Act of 1969 and they include exploration, prospecting and production rights.

This means that the State has the absolute right and control over oil resources in the country. Prior to the promulgation of the Act, oil companies that had obtained mining rights from the federal government approached oil-bearing, landowning communities for a right of access to the land for their operations and in so doing gave the communities some sense of involvement in granting access and for any damage to land and any surface rights thereon.

Forty years after the enactment of this law the petroleum industry in Nigeria is yet to achieve the reality of the stated intentions. The law gives individuals the right to their land’s surface improvements, but views minerals, mineral oil and natural gas in, under or upon the land as public goods and government’s intentions in their exploration becomes simply a case of public use, indicating that mineral right is vested in the state, whereas land owners have only surface rights. Other oil producing countries also have similar laws where mineral rights are vested on the state so this law is not exclusive to Nigeria alone.
In the USA for example a dual ownership system exists, the landowner owns mineral rights of onshore areas while the state and the federal government own mineral rights in/on public lands including offshore areas. In Canada on the other hand both the federal and provincial governments exercise control over different stages of the oil sector. Lands, mines, minerals and royalties are reserved for the provinces. A province has complete title to the petroleum resources in situ on the property within its territory.

In Nigeria section 77 of the Petroleum Act of 1969 expects an oil operator to pay to the landowner:
“such sums as may be fair and reasonable compensation for any disturbance of the surface of the land upon which prospecting or mining is being or has been carried on and shall in addition pay to the owner of any crops, economic trees, buildings or works damaged, removed or destroyed by him or by any agent or servant of his compensation for such damaged, removal or destruction.”

There is no specific indication or yardstick applied as a compensation benchmark. Neither is there any indication of how affected parties could be engaged for negotiations with a petroleum operator. In essence, host communities receive in return for the oil drilled from the habitat a compensation for loss of surface rights.

MNOCs are not at liberty to pay royalties to host communities and the issue of what constitutes adequate compensation has long been a source of friction between the oil producing communities and MNOCs (Don Pedro, 2006). According to Don Pedro (2006), in situations where compensation is paid the amount paid often fails to take into account the long-term impacts of the pollution on livelihood activities.

3.10.1 Land use act (LUA)
The LUA of 1978 is arguably the most controversial legislation in Nigeria today (Don Pedro, 2006). It remains one of the legacies of military rule as it was initially promulgated as a decree by a military government. It:
“Vests all the lands comprised in the territory of a state of the federation in the hands of the governor of the state in ‘trust’ and for the common interest of all Nigerians.”
Omoweh (2005) indicates that the decree is not applicable to land where MNOCs have been operating prior to 1978.

By implication this means that individual’s property surface improvements such as structures, buildings, crops, shrines, tombstones, and graveyards / cemeteries remain private, while minerals, crude oil and natural gas found in, under or upon the land are viewed by the state as public goods and government’s involvement in their exploitation is seen as a case of community utilisation.

Okonta et al. (2001) assert that the LUA is a draconian law which was designed by the state to strip local communities of land ownership rights and place such ownership in the hands of the state. Given that it gives the state the right to revoke a right of occupancy for overriding the public interest. Overriding the public interest includes host communities living on the land, yet unable to prevent the termination of their right of occupancy, since there is no provision in the law for consultation (AI, 2009). Notwithstanding this, host communities see the land as the only marketable stake they have in the oil business.

This law has drastically redefined the relations between communities and the biogeophysical environment in Nigeria. More worrisome is the fact that the Act denies courts the jurisdiction to inquire into matters of compensation relating to the provisions of the Act. Thus, not only can the state government acquire communal land, but it can also determine what compensation is paid for surface rights and who it is paid to (Omoweh, 2005).

Likewise, MNOCs follow oil production and trade section (OPTS) compensation rates. However, these rates do not recognise, and are much lower than the actual market prices of the economic structures on the land such as trees, crops and infrastructure, and do not take a long-term lost income perspective. For instance, there is no calculation of how much income a young palm or banana tree would provide during its life. This means that land users are not adequately compensated for the negative impacts on livelihoods that result from exploration activities (Omoweh, 2005).
3.11 Environmental laws

Concerted efforts by the Nigerian government to address environmental problems date back to 1988 following the illegal dumping by a foreign vessel of toxic hazardous waste within the port of a community called Koko in the present day Delta State, in the Niger Delta region, in May of 1988.

Prior to that, environmental matters were handled by the environmental planning and protection division (EPPD) within the country's ministry of works and housing. The incident forced the Nigerian government to promulgate the harmful waste decree which provides the legal framework for the effective control of the disposal of toxic and hazardous waste into any environment within the confines of Nigeria and is arguably responsible for the establishment of the federal environmental protection agency (FEPA).

There exists an extensive range of intervention laws and measures promulgated to keep Nigeria’s atmosphere, waters, and land clean and safe. They include:

- Federal Environmental Protection Agency Act (Decree No. 58 of 1988), the national guidelines and standards for environmental pollution control in Nigeria (March 1991);
- Pollution Abatement in Industries and Facilities Generating Waste Regulations of 1991;
- Waste management regulations of 1991;
- National Effluent Limitation Regulations of 1991;
- Environmental Impact Assessment Act (Decree No. 86 of 1992);
- Procedural and Sectoral Guidelines for Environmental Impact Assessment of 1991;
- National Guidelines on Registration of Environmentally Friendly Products and Eco-labelling, 1999;
- National Guidelines for Environmental Audit in Nigeria, 1999;
- National Policy on Environment 1999 (first published in 1989);
- National Guidelines for Spilled Oil Fingerprinting, 1999;
- National Resources Conservation Action plan;
- National Guideline and Standards for Water Quality in Nigeria;
• National Guideline on Environmental Management Systems in Nigeria, 1999;
• National Guideline on Waste Disposal Through Underground Injection 1999;
• National Fuel Wood Substitution Programme, and
• National Agenda 21 of 1999, which identifies the range of cross-sectional areas of environmental concern and outlines strategies to address them.

FEPA is charged with the overall responsibility for protecting and developing the Nigerian environment, hence it has the sole authority of issuing standards for water, air and land quality for the country (FEPA, 1989). It is notable that FEPA's choice of strategy in implementing Nigeria's environmental laws creates a favourable atmosphere for enterprise as a spin-off. FEPA describes this strategy as comprising:

“...Policy formulation, standard setting, establishment of guidelines and regulations as well as the monitoring and enforcement of the standards, guidelines and regulations through a consultative, participatory and collaborative approach as well as enlightenment and compliance promotion.”

Although there are fines and other sanctions provided for in the principal environmental laws in the event of non-compliance, FEPA's preference for compliance promotion as opposed to compliance enforcement implies that such sanctions would largely be honoured in their non-use.

FEPA further formulated a National Policy on the Environment (NPE) which serves as the working document for the preservation and protection of the Nigerian environment with the overall goal of achieving sustainable development. The policy’s main objective of “a commitment to ensuring sustainable development is entrenched in appropriate management of the environment with the aim of meeting the needs of both present and future generations.” (FEPA, 1989)

States and local municipality councils followed suit and established environmental regulatory bodies so that by 1998 all 36 states including the federal capital territory had established environmental protection agencies. NPE was established primarily for the sustainable development of the HS&E welfare of all Nigerians solely to:
• Secure a quality of environment satisfactory and essential for health and well-being;

• Maximise the utilisation of the environment and natural resources for the benefit of current and future generations;

• Preserve, sustain and enhance the ecosystem and ecological processes essential for the functioning of the biosphere to conserve biological diversity and the principle of optimum sustainable yield in the use of living natural resources and ecosystems;

• Increase public awareness and encourage understanding of the critical connections between the environment, resources and development, and promote individual and community involvement in environmental enhancement efforts, and

• Collaborate in good faith with other Nations, global organisations and agencies to realize optimal use of transboundary natural resources and effectual impediment or abatement of transboundary environmental degradation.

The policy is based on the proper management of the environment with a view to ensuring that organisations incorporate environmental concerns into key economic decision-making processes, and that major developmental projects are designed such that environmental remediation costs are included into project estimates, organisations apply environmentally friendly technologies in their project management processes, economic instruments are employed in the management of natural resources, organisations conduct environmental impact assessments on all major developmental projects and ensure routine evaluation and audit of all existing projects.

These laws and guidelines should provide the Nigerian society with the advantage of a healthy, safe and secured environment to live in, but as always with Nigerian’s weak institutions, evaluating, monitoring and implementing standards and policies remain a challenge (Allen, 2010).

In June of 1999, the federal ministry of environment (FME) was created and FEPA was absorbed within the ministry and all its functions taken over by the new ministry.
The various state governments followed suit and established ministries which absorbed and took over the functions of the moribund state environmental agencies.

The Environmental Impact Assessment (EIA) decree No 86 of 1992 was promulgated and directed at regulating the industrialisation process with considerable regard to the environment and requires a prior assessment for the impact of development activity on the environment.

It affords an opportunity for civil societies, and concerned bodies to contribute or raise concerns to the relevant institutions over the proposed human activity. FME have published several guidelines and procedures for evaluating environmental impact assessment reports.

The DPR followed suit in 1991 by setting out comprehensive standards and guidelines to direct the execution of projects with proper consideration for the environment through the environmental guidelines and standards (EGAS) of 1991 for the petroleum industry. The EGAS seriously considered the preservation and protection of the Niger delta region, relative to oil exploration and production of crude oil.

The EIA tool is mandatory for a greater part of the oil exploration and production (E&P) activity. The licensees and lessees are expected to carry out their operations in a proper and workmanlike manner in accordance with acceptable practices and regulations. It is obvious that most of Nigeria’s policy on the environment was formulated in the 1990s. Prior to then MNOCs were operating freely and were not held accountable for the destruction of the environment (Allen, 2010).

Cohen (2008) considers that organisations in spite of their intention to comply with environmental laws could accidentally breach some laws. In some cases it may be impossible for organisations to act in accordance with some existing laws, and contravention might occur hence risking government’s sanction or imposed penalties which could result in bad public relations / media propaganda. Which arguably explains the scenario in Nigeria, the only difference is that the Nigerian oil and gas industry is a poorly regulated one anyway and hence it becomes easy for MNOCs to
take advantage of the country’s poor regulatory monitoring system and lack of enforcement (Allen, 2010).

3.12 Petroleum laws
Some of the laws governing the petroleum industry include:

- Nigerian oil and gas legislation which has existed since 1897 when the first petroleum ordinance was enacted;
- Public Health Act of 1917;
- Mineral Oil (Safety) Regulations 1963 for safe discharge of inflammable gases, provides penalties for contravention and non-compliance;
- Oil Pipelines Act Cap 145, 1956, reviewed in 1958 and 1965 respectively; which grants the rights and obligations of licence holders to payment of compensation for economic crops and property damaged;
- The Petroleum Control Act of July 13, 1967, prohibits discharge or escape of petroleum into waters, makes provision for precautions in the conveyance of petroleum and rules for safe operation of pipelines;
- Oil in Navigable Waters Act of 1968; it prohibits oil discharge to areas of the continental shelf within which any oil terminal is situated;
- Petroleum Act No. 51 of November 27, 1969, and its petroleum (drilling and production) regulations; requires licence holders to take all practical precautions to prevent pollution of inland waters, rivers, waters courses, the territorial waters, or seas by oil or other fluids or substances;
- Offshore Oil Revenue (Registration of grants Act) of April 1, 1971;
- Petroleum Refining Regulations 1974; construction requirements for oil storage tanks to minimise damage from leakage;
- Exclusive Economic Zone Act of October 2, 1978;
- National Inland Waterways decree of 1997;
- Associated Gas Reinjection Act;
- Harmful Waste Decree;
- Territorial Waters (Amendments) Act 102, and
- Petroleum Industry Bill which is currently before the national assembly.
The DPR is responsible for, *inter alia*, ensuring that petroleum production activities are run efficiently, with regard to procedures, operations and conservation, and the protection of the environment from petroleum sector activities.

In 2002, the DPR also revised its EGAS with a National oil spill contingency plan which established a national system for responding promptly and efficiently to oil pollution incidents and was drafted in compliance with Nigeria’s international obligations as signatory to the international convention on oil pollution preparedness, response and cooperation, 1990 (Allen, 2010).

### 3.12.1 Petroleum industry bill

The Petroleum Industry Bill (PIB) was sent to the national assembly in 2009 by the federal government. The government intends through this bill to set out a new legal framework for the re-organisation and operation of the entire oil industry in Nigeria. The PIB is based on the report of the oil and gas reform implementation committee (OGIC) set up by the federal government in the year 2000. The committee was established to carry out an all-inclusive reform of the oil and gas sector.

The fundamental objective of the PIB is to develop an instrument governing the petroleum industry, one edition of legislation that establishes unambiguous policy, procedure and institutions for the administration of the petroleum industry in Nigeria to replace the existing myriad of pieces of legislation. The PIB combines sixteen different Nigerian petroleum laws in a single transparent and articulate document. The document contains a holistic review of the oil and gas industry relative to operations including investment, and local content policies.

Worthy of note is its implications for on and off-shore operations and the pace of project development. Some of the key areas addressed in the bill, *inter alia*, include: environmental and air quality emissions, where the federal government commits to honour international environmental obligations, promoting energy efficient processes, and the introduction of a taxation policy that encourages fuel efficiency by producers and consumers. The document stipulates that the government shall introduce and enforce integrated HS&E quality management systems with specific
quality emission targets for oil and gas related pollutants, without regard for fuel type such as liquid or solid, in order to comply with international standards.

Another area the bill addresses is community development, here the Government in alliance with the states, local municipal councils and host communities will encourage and ensure the peace and development of the petroleum producing areas of the federation through the implementation of specific projects aimed at ameliorating the negative impacts of petroleum activities.

The PIB which aims to overhaul the Nigerian National Petroleum Corporation, creates an independent regulator, fosters a greater role for home-grown oil groups and reverses under-investment which is seen as a crucial part of efforts to render Nigeria’s vast oil revenues more transparent and accountable. Unfortunately, the bill has seen slow progress since it was presented to the national assembly. The PIB though laudable is an ambitious effort to meticulously reform the sector.

Theoretically it makes sense but past attempts have shown that the State may not have the practical capability to ensure its execution. As at March 2013 the bill is yet to be passed. Once again indicating that a country may have wonderful environmental laws and regulations, however without enforcement those laws are just words on paper. The cost and mistakes associated with bureaucratic decision making, as well as the likelihood of political influence in the process, will clearly have a huge impact on government’s ability to respond effectively to the challenge.

3.13 Resource conflict

Different schools of thought have emerged over the years on the root cause of the oil conflict and crisis in the Niger Delta and ample reasons have been given for the age long battle. For some, bad governance explains why there are incessant conflicts in the region (Ojakorotu, 2008; Azaiki, 2006; Okonta et al., 2003; Saro Wiwa, 2003).

However, others maintain that the root cause consists in the evolution of a class structure in Nigeria with its corrupt and venal outlook on the national coffers (Omeje, 2004). In a nutshell it is not difficult to fathom the proximate reasons for the conflict in the region. One thing is sure, the list is endless.
Social researchers suggest that the conflict is attributable to the distorted structure of the Nigerian federation, marginalisation of the people of the region, decades of poor HS&E management during oil and gas activities, ethnic identities, the policy or role of the government and the retention of legislation widely perceived as obnoxious (Obi, 2008; Etekpe, 2007b; Ojakorotu, 2010a; Azaiki, 2006; Ibeanu, 2000a).

The conflict which is driven by a range of factors, notably disintegration and alliance of existing groups, formation of new militias and transformation of community vigilantes, street and campus cults into militant groups, continues to generate debates among researchers and policy makers (Davis, 2009). Figure 3.13 depicts a militia shrine raided by members of the JTF.

**Figure 3.13: Depicts a militia shrine raided by members of the JTF**

Source: Author (2010)

The development has been referred to as an ‘oil war’ or ‘oil crises’ given the centrality of oil to the violent conflicts in the region (Omeje, 2006). Consequently, conflicts in the region have been classified as natural resource conflicts, with Nigeria joining the unenviable ranks of countries debilitated by the natural resource curse, the
paradox of plenty or Dutch disease (Rosser, 2006; Watts, 2008; Sachs and Warner, 2001; Gary and Karl, 2003).

Scholars have indicated that the conflict though focused on the consequences of oil extraction with evidence of ecological degradation, is fundamentally driven by social, economic and political factors (Azaiki, 2006; Saro-wiwa, 2003). This view is reiterated by Ojakorotu (2006b), who states that the refusal of the State and MNOCs to appropriately address the destruction of the environment of the Niger Delta, which has adverse effects on the lives of the people, has exasperated communities.

Ojakorotu (2006b) reports that very limited economic opportunities are available in the Niger Delta region. Infrastructure and social services are virtually non-existent and where found are in very deplorable condition. There is a general rate of poor performance within the local municipalities in the region.

In 2006, a UNDP report which was based on a human development conditions survey carried out in the region, indicated that the conditions of rural communities where crude oil is explored are deplorable, with severe environmental degradation, disease, sickness, and no access to safe drinking water, electricity and roads. Consequently, analyses of poverty and human development paint a dismal picture, particularly when the region is compared with other oil-producing regions in the world. The report concludes that in the Niger Delta, the results of poor development have been disillusionment and frustration among the people about their increasing deprivation and deep-rooted mistrust.

These factors have left youths in the region feeling hopeless and hence easily coaxed into violence and crime. Figure 3.14 depicts youths arrested with machines and equipment used for oil theft.
Hardly a day passes without reports in both international and local news media on the growing insurgence by armed militia in Nigeria’s oil rich Niger Delta. As observed by Anstey (2006), change is the reason for all conflict and conflict occurs as a result of related tensions, such as nations fighting to expand their territories, minority groups agitating for self-determination as is the case in the Niger Delta, the oppressed wanting freedom or employees wanting better remuneration. He argues that conflict is a struggle over ideals, power, scarce resources and identity, where the objective is to eradicate one’s opponents.

Hence, conflict is caused by actions that contending parties take towards each other due to the incompatible objectives they are attempting to achieve. Pruitt and Sung (2004) indicate that not all conflicts end with a victor and a vanquished, but that an amalgamation of the two opponents often results in some integrative agreement that benefits both parties.

Pruit et al. (2004) reflect that for group conflict to succeed there must be a unity of ideas between all group members. Otherwise, the group will fall apart and will not be effective in achieving its objectives. Intergroup conflict is a social process necessary for the persistence of group life. The down side of conflict they indicate is the lethal
effects of conflict seen in the pain and suffering experienced by individuals affected, especially when it becomes violent.

Theorists argue that social conflict occurs as a result of uneven allotment of scarce resources such as class, status and power. The importance of a crosscutting effect stems from the various structures of inequality. Ojakoroto (2010b) suggest that this results in the situation whereby a community questions the legality of a structure where a particular group of people control access to class, status and power. Hence when a group feels a sense of deprivation caused by class, it could lead to conflict and social change.

According to Ojakorotu (2010b), some proposed conflict theory suggests that two types of deprivation exist:

- Absolute deprivation: This refers to a group of people living well below the poverty line; they are weighed down by their situation and condition so that they are unable to be involved in conflict, and
- Relative deprivation: This is when people feel they are disadvantaged compared with others; as a result, they feel left out of the ‘good life’. Persons in this category have the resources to become involved in conflict and social change.

Other theories further advocate the possibility of conflict being sporadic by the degree of hostility involved. They assert that if the goals of the people are believed to be greater than the group and the worries of the essentials of daily living, then the degree of violence tends to be very high. However, if the goal of the people is directed at everyday worries, the degree of violence tends to be low. They further suggest that whenever the state sees violence as necessary, reasons are normally couched in moral terms. They agree that goals which are poignant and stimulating tend to generate violent conflicts.

Ojakorotu (2010b) opines that examples of two situations of functional consequences of conflict are conflicts which exist within a group and those which exist outside the group. For instance, conflict within a group is inter-tribal conflict amongst neighbouring communities within the Niger Delta region despite sharing the same social system.
They report that some researchers opinion that there is a propensity for low-level recurrent conflict to release hostilities and, therefore, keep conflict from developing and becoming disintegrative for the system. Internal conflict can be divided into two: the ones that threaten or challenge elemental beliefs of the group and the ones that do not.

Therefore a war involving a nation is an external group conflict. A group experiencing external conflict develops strong borders around it, group members develop team spirit and comradeship, authority is effectively exercised and the group is inclined to establish alliance with other groups. The group’s ability to survive is dependent on its capacity to embrace and reject people.

The Niger Delta crisis as mentioned earlier is classified as conflict generated by natural resources. Natural resource conflict can be classified into the kind of resource being contested, the public private composition of the resource extractors, the security providers, and the disposition of the instigators and goal of the carnage (Pegg, 2003).

Pegg (2003) claims that the structure and shape taken by natural resource conflict is determined by the nature of the resources being contested and the degree of capital involved in their extraction. Hence, when natural resources can be extracted with nominal expertise or skills and independent of State machinery, the likelihood of economic violence among rebels becomes high. On the other hand, when the cost of extracting the resource is high, MNOCs are forced to rely on State structures for security. Then, the probability of having a feeble state losing control of its territory is likely.

This explains the situation between the Nigerian state and the MNOCs on the one side, and the Niger Delta militants on the other side. The interest of the MNOCs has become a major priority to the State for obvious reasons. This supports Pegg’s assertion that hostilities can be divided into unidirectional violence, which flows in one direction, and multidirectional violence, which flows to and from opposing parties. Unfortunately, both types are experienced in Nigeria.

The Niger Delta militants’ strategy of matching perceived violence with violence has had an adverse effect, both at home and abroad, on oil production. Table 3.8 depicts a summary of the escalation in crude oil prices.
Table 3.8: Spot crude oil price summary (Average)

<table>
<thead>
<tr>
<th>Year</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonny Light Crude (US$/Barrel)</td>
<td>18.1</td>
<td>28.5</td>
<td>24.5</td>
<td>25.2</td>
<td>28.8</td>
<td>38.3</td>
<td>55.7</td>
<td>66.9</td>
<td>75.1</td>
<td>115.8</td>
</tr>
</tbody>
</table>

Source: Davis (2009)

The significance of oil to the conflicts is correspondingly underscored by the fact that the attention it has attracted has stemmed mostly from the implications of the conflict on global oil supplies in the wake of shrinking supplies since the commencement of the war on terror.

The shockwaves and reverberations that disruption of oil production sends to the global oil market has made the Niger Delta insurgency overshadow other situations of humanitarian emergencies. The significance of the Niger Delta oil to the global economy has also loomed large in the strategic calculations of armed groups in the region (Watts, 2008).

Williams (2002), however, argues that the Niger Delta conflict and violence can be perceived as a political conflict, because political conflict involves visibly resolving to access goods or services which in this case include environmental exploration/exploitation of petroleum products conducted in such a manner as to deny or restrict certain groups from access. She observed that the basis of environmental conflict cannot be removed from the political scenario applicable in the particular society, hence its close tie with the idea of political conflict. Williams (2002) defines political conflict as the struggle for access to the existing rights and privileges of society, which define citizenship within the nation-state. Figure 3.15 depicts an alleged oil bunkering and arms trading route in an oil producing community in River State.
3.13.1 Perceptions on drivers of the conflict

Clearly, both traditional and contemporary social, economic and political factors have aided the escalation of violence in the Niger Delta region according to Evoh (2009), Omeje (2004), and Ogri (2004). Politicians are responsible for funding militia groups, in order to use them to settle political scores with violence. This is a view supported by Babawale (2002) who indicates that the emergence of ethnic militias in Nigeria is as a result of the manipulation of ethnicity by the political elite across the various regions especially as a means of bargaining for power in the post-independence era. He further reports that the feeling of discontent amongst several groups resulted in the introduction of ethnic organs.

The protests by the militias were mainly as a result of provocation by the failure of the Nigerian state to promote equity among its component units, absence of social justice in its relationship with its constituents, and failure to compensate these communities for the degradation of the environment. This has resulted in a general lack of confidence among its citizens, a view reiterated by Ojakorotu (2006b), who reports that for decades host communities have unceasingly, peacefully protested against MNOCs and the Nigerian state. He indicates that the protests were centred on the people’s desire to control the resources and achieve sovereignty as all the laws
relating to oil exploration and land ownership do not favour host communities and their interests. However, both the state and MNOCs have ignored the needs of communities within the oil producing region, especially host communities. In other words, since the leaders in the region have failed to win concessions through peaceful means, and the State and MNOCs have refused to address the situation the youths see armed struggle as a last resort and it is no wonder that the situation has resulted in the people taking up arms against perceived oppressors (Ojakorotu, 2006b).

Etekpe (2007b), Azaiki (2006) and Omoweh (2005) argue that the infamous hanging of the environmental activists Ken Saro-Wiwa and eight others on May 21 1994 by the then military regime for the alleged killing of four Ogoni elites, heralded the escalation of the agitation for oil revenue rights by other host communities and thus led to the growth of youth awareness and mobilisation towards the plight of the people in the region and hostilities against MNOCs. To date this single incident remains a pivotal event in the history of Nigeria as it brought the world’s attention to the challenges of environmental degradation as a result of oil and gas exploration in the Niger Delta (Ojakorotu, 2008).

Azaiki (2006) asserts that some of the immediate and remote causes of escalation in violence, *inter alia*, include a general feeling by the 1990s of hopelessness and a bleak future, as a result of the youths in the region being frustrated by redundancy, poverty, incoherent and poor transition programmes, and being deprived of their human rights.

This is coupled with the perceived lukewarm attitude of leaders, elders and elites who are perceived as feeble, timid and hopeless in gaining contact / channels of communication with an unreasonable and oppressive State and exploitative and socially irresponsible MNOCs (Azaiki, 2006). Azaiki (2006) further argues that the refusal of MNOCs to honour the memorandum of understanding (MOU) signed between oil companies and host communities is another major driving force.

The breach of contracts has not resulted in government sanctions against the MNOCs and thus they have continued to conduct their operations without regard or consideration for the HS&E issues, yet operate differently in overseas operations in developed societies (Azaiki, 2006). Azaiki (2006) concludes by reporting that the
MNOCs’ disregard for the development of host communities, while ensuring their facilities within such communities enjoy utilities such as electricity, water supply, facilities such as recreation centres, well-equipped health centres, decent accommodation and top of the range telecommunication services, has also aggravated the situation.

On the other hand, Ojakorotu (2006b) states that the Nigerian federalism has not been successful in considering the worries, desires, and aspirations of the minority that make up the Niger Delta region, but has instead precipitated economic centralisation that favours the federal Government and the country’s elite. Thus, he uses the framework of the frustration-aggression theory to explain the oil crisis; the theory argues that frustration increases the likelihood of aggression.

This explains the creation of ethnic militia movements led by the youths in the region and the adoption of armed violence as the only course of action. In essence, past bitterness of being ostracised by the Nigerian state, lies at the core of the on-going crisis. This has given rise to the involvement of various players in the oil conflict (Ibeanu, 2000a; Agbu 2004; Ojakorotu, 2008). Figure 3.16 shows arms confiscated from members of a youth gang.

Figure 3.16: Illegal ammunition set ablaze on a canoe

Source: Author (2010)
One thing is certain; youth restiveness in the Niger Delta takes both overt and covert forms. All the aforementioned factors have made the region volatile and hence resulted in conflict between the youths and community leaders, government agents, and MNOCs (Omofonmwan and Odia, 2009).

3.13.1.1 Conflict between host communities and multinational oil companies

There is a perceived discriminatory employment practice against locals by the MNOCs (Saro-Wiwa, 2004). Host communities have a seeming belief that they are deliberately denied jobs with MNOCs. This development, argues Ojakorotu (2006b), is seen as a premeditated move to exclude the owners of the oil from benefiting from their natural resource.

The Ogoni community heralded a direct attack on the oil companies when they began a fight that shut down oil wells across their community. These events cost the oil companies and the Nigerian state about five hundred thousand dollars daily in profits, rents and royalties in Ogoni land alone (Davis, 2009). Table 3.9: depicts the quantity of oil loss per day in US Dollars for 2006.

Table 3.9: Quantity of oil loss in barrels per day / amount in US Dollars for 2006

<table>
<thead>
<tr>
<th>Month</th>
<th>Estimated quantity of barrels of oil lost per day</th>
<th>Total barrels of oil lost for the month</th>
<th>OPEC basket price for Bonny light crude oil for the month in US$</th>
<th>Total amount lost for the month in US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>700 000</td>
<td>21 700 000</td>
<td>56.18</td>
<td>1 219 106 000</td>
</tr>
<tr>
<td>February</td>
<td>700 000</td>
<td>19 600 000</td>
<td>59.58</td>
<td>1 167 768 000</td>
</tr>
<tr>
<td>March</td>
<td>700 000</td>
<td>21 700 000</td>
<td>64.59</td>
<td>1 401 603 000</td>
</tr>
<tr>
<td>April</td>
<td>700 000</td>
<td>21 000 000</td>
<td>70.01</td>
<td>1 470 210 000</td>
</tr>
<tr>
<td>May</td>
<td>700 000</td>
<td>21 700 000</td>
<td>70.03</td>
<td>1 519 651 000</td>
</tr>
<tr>
<td>June</td>
<td>700 000</td>
<td>21 000 000</td>
<td>74.45</td>
<td>1 563 450 000</td>
</tr>
<tr>
<td>July</td>
<td>700 000</td>
<td>21 700 000</td>
<td>79.21</td>
<td>1 718 857 000</td>
</tr>
<tr>
<td>August</td>
<td>700 000</td>
<td>21 700 000</td>
<td>73.34</td>
<td>1 591 478 000</td>
</tr>
<tr>
<td>September</td>
<td>700 000</td>
<td>21 000 000</td>
<td>79.87</td>
<td>1 677 270 000</td>
</tr>
<tr>
<td>October</td>
<td>700 000</td>
<td>21 700 000</td>
<td>79.32</td>
<td>1 721 244 000</td>
</tr>
</tbody>
</table>
Subsequently, on January 11, 2006, a commando style attack was carried out by militia groups on SPDA’s Trans Ramon pipeline at the brass creek when four oil workers were kidnapped. The attack resulted in a production loss of 120,000 barrels per day of crude oil (Davis, 2009). A loss of oil revenue in Nigeria is a loss of government earnings.

Another angle to this conflict between MNOCs and communities is the terminologies popularly known as point of derivation (POD) and right of way (ROW). The research study determine that communities were aggrieved with these labels which simply means that communities who have ROW are used only as passage routes for pipeline networks or access to source, they are not duly compensated or do not receive as many benefits as those where the resource is sourced. This action by MNOCs has fuelled violence between communities, created disunity amongst communities in the region and is perceived by locals as a deliberate attempt to impoverish the people.

Another factor which has contributed to the escalation of aggression towards MNOCs is the stance of the Nigerian State, which involves the protection at any cost of MNOCs from perceived aggression (Ojakorotu, 2008). Ojakorotu states that the attitude of the state has resulted in making the Niger Delta region a hot bed of war between host communities on the one side and MNOCs and state forces on the other side.

Hence encouraging the barricading of routes to oil and gas wells, and rig sites, or seizing / intercepting /destroying equipment on transit to oil development and installations, pipeline vandalism by community members and oil bunkering by criminal elements. These actions have resulted in a heavy loss of and injury to human lives, and thereby engendered an atmosphere of insecurity in the region.

| November | 700 000 | 21 000 000 | 88.84 | 1 865 640 000 |
| December | 700 000 | 21 700 000 | 87.05 | 1 888 985 000 |
| Grand Total | | | | **18 805 262 000** |

Source: Newswatch weekly (2009)
3.14 Security

According to Nlebem (2010), security can be viewed from various perspectives based on perceptions. He defines security within the context of an organisation as connoting the protection and preservation of assets and individuals within the firm, and the environment it operates in. Security means the protection from loss occasioned by criminal activities, such as fire, fraud, embezzlement, kidnapping, assassins, sabotage, espionage, and other forms of human and material loss, of an organisation and individual or asset (Nlebem, 2010).

The term national security is the traditional definition for the protection of a state, nation or territory from external threats, specifically if the concept is perceived as the continued ability of a country to pursue its internal life without serious interference (Ikelegbe, 2010).

Nlebem (2010) posits that the notion of security is entrenched in political pragmatism which views security from a state-centred perspective and which restricts the application of security to threats in the military realm. Traditionalist security scholars associate security with the prevention of conflict by military means which results in peace. Figure 3.17 depicts a military post at an oil producing community in, Rivers state.

**Figure 3.17: JTF members at a military check point in Abonema town, Rivers State**

Source: Author (2010)
Therefore, traditional security scholars consider that provided the state is able to preserve its territorial borders, its governing regimes and structures from attacks or any threat to its existence and its economic relations with the international community, then the State is said to be secure.

In Nigeria, government’s shrinking resource base which is due to the oil crisis and the resultant conflict it elicits are perceived as potential threats to national security. Accordingly, in order to possess national security, a nation needs to possess economic security, energy security, environmental security and most importantly human security.

3.14.1 Human security

Today, human security is becoming an issue of global concern with the entire concept of security changing dramatically from focus on the shift from the security of nations, states or territory towards individuals and people. Clearly, the prime values are individual safety and well-being in the broad sense.

However, to a great extent the state remains the fundamental purveyor of security. The concept of human security implies the protection of individuals from any situation that poses a threat to a person’s right to existence, such as the threat of sickness or disease, food shortage, or anything that deprives man of his liberty. It also refers to the protection or safety from future risk of severe deprivation, injury or death (Ikelegbe, 2010).

In other words, human security is concerned with how people live in a given environment, how they exercise their choices and whether they live in peace or conflict (Ikelegbe, 2010). More precisely, the objective of human security is to safeguard the vital core of all human lives from critical pervasive threats, in a way that is consistent with long-term human fulfilment.

Vital to the human security argument is the perspective of human well-being and it includes broad issues of human concern, such as security from poverty, disease, famine, illiteracy, environmental despoliation and unemployment, which singly or jointly contribute to impairments of human existence (UNDP, 2006). Figure 3.18
shows members of the JTF patrolling the waters to deter militants from operating on water ways.

**Figure 3.18: Joint task force members in gun boats patrolling the waters**

Human security means protecting fundamental freedoms, such as freedom from doubt and freedom that ensures a degree of confidence and assurance amongst members of the State. It is more challenging to note that the preservation of human dignity is the core of human security, human rights and human development. It means using processes that build on people’s strengths and aspirations.

However, human security is threatened by issues such as disease, unemployment, poverty, illegal drugs, crime, pollution and human rights violations (Onduku, 2004). It can be of local, national or global dimensions such as the threat to the environment as a result of global warming. Or in the case of national security the scenario in Nigeria, where what is perceived as the greatest threat at both national and international levels to peace and security is terrorism and what has gained notoriety as Nigeria’s greatest security challenge, Niger Delta militancy. Militia groups and local gangs attack, occupy and shut-down oil facilities, including offshore rigs and platforms, in attempts to extort money from MNOCs, they threaten oil and gas production and kidnap foreign and later local oil workers for ransom (Davis, 2009). Figure 3.19 shows members of the JTF on patrol along designated routes.
Nlebem (2010) further claims that security contains elements of psychology because it does not only involve freedom from risk or danger, but as earlier mentioned also freedom from doubt, anxiety or fear and anything that gives or assures man’s safety. Security therefore, includes the appropriate understanding of the psychology of human behaviour. Hence security indicates an area of concern rather than a precise condition.

Society today, more than ever before, is faced with the challenges of safe guarding the environment, human lives and properties and how to avoid stronger regions subduing weaker regions. It is not surprising that since the September 11 2001 airplane attacks on the twin towers of the world trade centre in New York, where over 3 000 citizens from 78 countries lost their lives, governments all over the world have had to review their perceptions relative to security (Liesch, Steen, Knight and Czinkota, 2008). Consequently, in the aftermath of the 9 / 11 attacks security threats from acts of terrorism became a part of security considerations for organisations all over the world.

This singular incident has entirely changed the way and manner nations and organisations view security (Liesch et al., 2008).
Liesch et al. (2008) report that agencies such as the military, naval forces, air forces, ground forces, intelligence agencies, the police agencies responsible for maintaining security, law and order in various nations around the world have been placed on high alert. In addition, government agencies, international organisations and other public entities have imposed new regulations, and other measures and processes intended to pre-emptively avert terrorism or manage its consequences.

Some have been compelled to recruit security consultants to assist in formulating contemporary security policy to address present-day challenges and bridge security lapses, design exit strategies and develop evacuation procedures. Figure 3.20 shows militia groups patrolling the water ways.

**Figure 3.20: Members of a militia group traversing the waters**

![Image of militia group](201012200101PM.jpg)

Source: Author (2010)

This scenario has been nowhere more evident than with the MNOCs in Nigeria who have had to review and revisit security budgets and channel resources toward ransom payments and settlement for kidnapped energy sector workers. Workers’ safety has become a top priority for MNOCs operating in Nigeria.

According to Soyinka and Ofuokwu (2009), other measures adopted include relocation of essential workers categorized as high risk back to head office premises.
where they are kept under heavy security by both the state and the MNOCs. Foreign non-essential employees have been relocated back to the parent head office or other countries for security purposes. All foreign employees’ families have been evacuated out of the country and relocated back to their home countries. The costs of these necessary measures have been heavy on resources.

On the other hand, for managers in these contexts, it is imperative to readjust from managing risk to taking decisions under conditions of true uncertainty. Onduku (2004) opines that security policies should be designed and directed towards saving life, workers’ safety, protection of the general public and the environment, caring for the injured, defence of the organisation’s corporate image, limiting damage to assets, liaison between the organisation and appropriate state, industry and host communities and ensuring appropriate H&S procedures and training is provided. Table 3.10 contains a list of threats and casualties recorded as a result of the oil crisis in Nigeria from 2006 to 2008.

Table 3.10: Cost of crisis in the Niger Delta region

<table>
<thead>
<tr>
<th>Date</th>
<th>Incident</th>
<th>Location</th>
<th>Casualty / loss</th>
<th>Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/11/06</td>
<td>Gun men attack on SPDA oil facility</td>
<td>Off-shore E.A Field, Rivers state</td>
<td>4 foreign energy sector workers kidnapped</td>
<td>12 000 bpd</td>
</tr>
<tr>
<td>01/11/06</td>
<td>Explosion on major crude oil pipeline belonging to SPDA</td>
<td>Forcados, Delta</td>
<td></td>
<td>100 000 bpd</td>
</tr>
<tr>
<td>01/11/06</td>
<td>MENDS attacked SPDA facility</td>
<td>Port-Harcourt</td>
<td>17 soldiers killed, unspecified number of militants and SPDA staff died</td>
<td></td>
</tr>
<tr>
<td>04/10/06</td>
<td>US oil executive attacked</td>
<td>Port-Harcourt</td>
<td>Baker Hughes died</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Incident</td>
<td>Location</td>
<td>Casualty / loss</td>
<td>Loss</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------------------------</td>
<td>---------------------------</td>
<td>----------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>06/02/06</td>
<td>Norwegian offshore rig attacked</td>
<td>Port-Harcourt</td>
<td>16 crew members kidnapped</td>
<td></td>
</tr>
<tr>
<td>08/21/06</td>
<td>MENDs and Security agents clash</td>
<td>Delta State</td>
<td>10 militants killed</td>
<td></td>
</tr>
<tr>
<td>09/12/06</td>
<td>Militants attacked Chevron offshore oil field</td>
<td>Delta State</td>
<td>1 energy sector worker died</td>
<td></td>
</tr>
<tr>
<td>10/02/06</td>
<td>MENDs ambushed soldiers in their patrol boat</td>
<td>Off the shore of the Niger Delta</td>
<td>10 soldiers killed</td>
<td></td>
</tr>
<tr>
<td>10/02/06</td>
<td>SPDA Nigerian convoy attacked</td>
<td>Port-Harcourt</td>
<td>Energy sector workers all SPDA personnel wounded</td>
<td></td>
</tr>
<tr>
<td>10/03/06</td>
<td>Western Oil workers attacked</td>
<td>Rivers State</td>
<td>7 energy sector workers kidnapped</td>
<td></td>
</tr>
<tr>
<td>10/04/06</td>
<td>Soldiers attacked militant camp</td>
<td>Rivers State</td>
<td>9 soldiers killed</td>
<td></td>
</tr>
<tr>
<td>11/22/06</td>
<td>Soldiers stormed militant camp to rescue kidnapped Oil workers</td>
<td>Rivers State</td>
<td>1 soldier killed</td>
<td></td>
</tr>
<tr>
<td>12/07/06</td>
<td>Attack on unidentified location</td>
<td>River State</td>
<td>4 foreign energy sector workers were kidnapped</td>
<td></td>
</tr>
<tr>
<td>12/21/06</td>
<td>Attack on Obagi station</td>
<td>Rivers State</td>
<td>3 security men killed</td>
<td></td>
</tr>
<tr>
<td>01/16/07</td>
<td>Attack on oil vessel near Bonny island</td>
<td>Bonny Island, Rivers State</td>
<td>187 000 bpd</td>
<td></td>
</tr>
<tr>
<td>04/04/07</td>
<td>Sabotage on pipeline feeding Bonny export terminal</td>
<td>Rivers State</td>
<td>150 000 bpd</td>
<td></td>
</tr>
<tr>
<td>04/01/07</td>
<td>Attack on Chevron offshore oil facility</td>
<td>Funiwa, Delta State</td>
<td>6 energy sector workers kidnapped</td>
<td></td>
</tr>
<tr>
<td>04/03/07</td>
<td>MENDs attack offshore vessel</td>
<td>Rivers State</td>
<td>6 energy sector workers kidnapped</td>
<td>50 000 bpd</td>
</tr>
<tr>
<td>04/04/07</td>
<td>Attack on Saipen site</td>
<td>Okono / Okpoho, Rivers State</td>
<td>Several oil and construction workers wounded</td>
<td>42 000 bpd</td>
</tr>
<tr>
<td>04/07/07</td>
<td>Protest at Chevron flow station Escravos terminal</td>
<td>Abiteye, Delta State</td>
<td></td>
<td>98 000 bpd</td>
</tr>
<tr>
<td>04/08/07</td>
<td>Attack oil pipeline in Brass and 2 in Akasa</td>
<td>Bayelsa State</td>
<td></td>
<td>170 000 bpd</td>
</tr>
<tr>
<td>Date</td>
<td>Incident</td>
<td>Location</td>
<td>Casualty / loss</td>
<td>Loss</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>--------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>04/19/08</td>
<td>Attack on two SPDA pipeline in Soku-Buguma and BugumaAlakri</td>
<td>Adamaki-Rivers State</td>
<td>12 oil workers kidnapped</td>
<td></td>
</tr>
<tr>
<td>04/21/08</td>
<td>MENDs vandalised a major crude oil pipeline at Kula</td>
<td>Rivers States</td>
<td>6 oil workers kidnapped</td>
<td></td>
</tr>
<tr>
<td>05/02/08</td>
<td>Attack on SPDC oil facility</td>
<td>Soku / Alakri-Rivers State</td>
<td>5 persons kidnapped</td>
<td>15 000 bpd</td>
</tr>
<tr>
<td>04/26/08</td>
<td>Assault on SPDC pipeline forcing closure</td>
<td>Bayelsa State</td>
<td>8 persons kidnapped</td>
<td></td>
</tr>
<tr>
<td>06/09/08</td>
<td>Militants and security forces engage in gun battle</td>
<td>Delta State</td>
<td>6 militants and 29 soldiers reportedly killed</td>
<td></td>
</tr>
<tr>
<td>06/19/08</td>
<td>MENDs struck SPDC Bonga facility on deep offshore oil fields</td>
<td>Rivers State</td>
<td>Over 100 people killed</td>
<td></td>
</tr>
</tbody>
</table>

Source: Ajaero (2009)

Nlebem (2010) indicates that policy measures are designed to take into account the dynamism and changes in security business and to allow for flexibilities in their application within the varied environs and functions of the organisation. It is claimed that 100% security is unachievable and security can never be absolute, neither can protective measures be applied in one standard form (Nlebem, 2010).

To address the heightened uncertainties, the Nigerian government set up and deployed the JTF made up of men from the Nigerian military, Nigerian Navy, Nigerian Police, Nigerian prisons and State security service. The JTF has been given the mandate to restore law and order to the Niger Delta region. This is to be achieved through deterring mischief makers and saboteurs, curtailing the activities of various cult and militant groups by depriving militants who refused to accept amnesty and other cult group’s freedom of action and ability to operate on land and waterways, while safeguarding oil and gas workers, securing oil and gas installation / infrastructure; preventing penetration of hoodlums and movement of arms and ammunition.
The JTF teams are engaged in aggressive mobile patrols, snap and deliberate road blocks are measures applied to achieve this goal. They conduct day and night patrols. Various checkpoints are maintained at strategic points such as jetties and road junctions within the region to prevent penetration of hoodlums and movement of arms and ammunitions. Stop and search operations are often carried out on vehicles and boats at random. Figure 3.21 shows members of the JTF navigating the waters.

Figure 3.21: Depicts members of JTF navigating the waters

Source: Author (2010)

3.15 Conclusions

The challenges experienced in Nigeria’s oil crisis result from internal dynamics and complexities coupled with an unstable business environment, the underperformance in global / international standards and weak institutions.

Clearly, the enforcement agency responsible for environmental management has failed in its responsibility relative to the oil and gas industry. The role of institutions in a country cannot be over-emphasized, especially in the case of resource-abundant countries in the development process. The rule of law is paramount in ensuring transparency and accountability and plays a significant role in determining whether natural resources become a curse or a blessing. Institutions are so central to progress
that in dealing with them state actors must be focused on the long-term good of society rather than small time transaction partisanship.

Although various variables can be used to review state performance some of which include the state of institutions, the value system, culture, and leadership, the state of institutions is a veritable barometer for the health of a nation. Unfortunately, weak institutions remain the bane of progress in most African countries. For Nigeria, in the past five decades the situation has just become much worse.

Undeniably, some of the increasingly urgent challenges which will continue to confront organisations in the future will include technology, terrorism and the environment. This may ensure that these may become the greatest issue to be tackled in this millennium. There interrelation with human rights, economic development, globalization, population growth, democracy and the well-being of mankind will ensure they remain in the forefront of discussion in global gatherings around the world.

Nigeria is not immune to the issue, the strategy of tying the politics of oil and gas in Nigeria to the environment has resulted in huge implications for Nigeria especially with the international environmental community. However, the fact remains that when reviewing the history of the oil producing region it is clear that the region has been affected most by the direct and remote consequences’ of oil extraction, with evidence of ecological degradation and deleterious effects on human and material resources.

Unfortunately, the truth of the situation remains the same, oil and gas exploration and production activities are being conducted in extreme environmentally unfriendly ways. One of the reasons could be because the ISO14001 model, as with numerous others existing today, is a voluntary code for organisations with no legal enforcement. Moreover, the required independent verification in the implementation of environmental management under the ISO 14001 is lacking for the petroleum sector in Nigeria.
This has contributed to the situation, seeing that despite the availability of a rich list of environmental management laws, ecological degradation is prevalent. Nigeria’s signing of the Kyoto protocol and the United Nations Agenda 21, notwithstanding. Furthermore, most of these regulations are out-of-date and need urgent overhauling or review to conform to modern trends.

Another significant characteristic of the HS&E regime in Nigeria is its pathological nature of handling accidents whilst most countries have moved on to proactive and generative stages of managing HS&E.

Nations that have sound and quality institutions manage their revenue and resources well and lead their economies towards growth. Ill-defined property rights, missing or imperfect markets and slack legal structures lead to widespread rent-seeking behaviour, thereby negatively impacting growth. High dependency on natural resources has had negative effects on the economy unfortunately, and Nigeria lacks diversification in economic activities. Nonetheless, development requires vision and only visionary leaders can turn around the fate of the people and country.
CHAPTER 4
RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

Research refers to different types of scientific inquiry and it has been used to describe two major approaches to research design which entail a theoretical or a practical approach. Modern social science researchers have often emphasized the significance of combining both schools of thought in a research study (Yin, 2009; Burns and Burns, 2008; Welman, Kruger and Mitchel, 2005).

This section of the study describes the theoretical and methodological arguments that underlie the conducting of this research. It examines the research design, the methods and techniques and procedures that were followed in conducting the study. This chapter includes sections describing: population and sample stratum, research design, instrumentation, procedures for data collection, and data analysis. A single case study research approach was adopted to examine various performance aspects of oil and gas operations.

A research survey using questionnaires was used to capture the experiences and perceptions of various stakeholders involved directly in the oil and gas industry. The rational for choosing the given approach have been provided.

The objective focus of this chapter is to establish an appropriate research strategy for a given research problem. The research strategies must be applicable to the nature of the problem. It will be assumed that the nature of the research problem, the objectives of the research and the methodology of the research, focus the research strategy towards triangulation with the primary research methodology focused on quantitative research and the secondary research on qualitative research.

4.2 Definition of research

Research is a critical investigation into a precise problem or concern which results in contemporary or innovative knowledge (Burns et al., 2008). Research involves using a range of orderly thoughts, actions or techniques to obtain scientific knowledge (Welman et al., 2005) and therefore it is aided by skills of inquiry, experimental
design, unbiased collection of information, measurement and analysis, by interpretation and by presentation of discovery or findings.

Leedy and Ormrod (2005) suggest that research is a logical method of collating, examining and interpreting collected facts and data in order to enhance understanding and knowledge of a specific phenomenon.

They indicate eight distinct characteristics of research to include:
- It begins with a problem or a question;
- It requires clear verbalization of a goal;
- It requires a detailed map of actions;
- It divides the primary problem into more manageable sub-problems;
- Is guided by the specific research problem, question or hypothesis;
- It accepts certain key assumptions;
- It requires the compilation and analysis of data with the aim of resolving the problem that initiated the research, and
- Is by its nature, cyclical or more exactly, helical.

Scientific knowledge needs to be obtained by means of systematic knowledge and not selective or accidental observation, it must be obtained in a controlled manner to enable the logical exclusion of any alternative explanation for the findings and finally the approach applied to obtain scientific knowledge must be replicable (Welman et al., 2005). These definitions suggest that basic research involves finding something that is not known. Hence it allows researchers to question what is known and focus on new aspects of society’s complex reality.

Research answers questions to solve problems, it answers both ‘what’, ‘how’ and ‘why’ questions, with ‘what’ question referring to the data collection process and the ‘why’ question involving the analysis of collected data which looks for explanations, relationships, comparisons, predictions, generalisations and theories (Yin, 2009).
According to Neuman (2006), research can either be used to advance general knowledge, or to solve specific problems. Either way it is a human activity which promotes critical thinking in a cross-functional approach. It is about understanding, rather than just explaining and it is committed to establishing unwavering and legitimate knowledge about the social world (Kumar, 2011).

4.3 The philosophical foundation

Philosophy is the origin of the science of research. The philosophy of research can therefore be viewed as an approach and manner of conducting research and how the physical realm, theories, empirical data and models relate to each other. Creswell (2002) considers that philosophical opinions influence the practice of research and need to be identified.

However, the methodology of a research project is motivated by certain viewpoints which could be classified under ontological and epistemological perspectives relative to the reality of the social world. Invariably these perspectives affect the way a research study is conducted. Nevertheless, paradigms can be argued for or against depending on a researcher’s standpoint.

Consequently, design decisions will usually depend on philosophical perspectives or assumptions, such as the very fundamental decision to employ a quantitative design or an interpretive design. The support provided by a philosophical foundation is logical and conceptual, not physical; after all, a foundation justifies the structure it supports.

If scientific ethics are perceived as a system of rules, concepts, beliefs, and practices, then their foundation consists of basic principles and concepts that justify this system.

This is why the philosophical base is very important to a researcher. Consequently, understanding philosophical issues provides a sound basis for a methodological argument regarding the research.

4.3.1 Ontology perspective

Lawson Latsis, and Martins (2007) and King and Horrocks (2010) describe the root definition of ontology as ‘the science or study of being’, and further developed this
description to encompass claims about what exists, what it looks like, what units make it up, what similarities it has if any and how these units interact with each other. It is the science of what is, the kinds and structures of objects, properties, events, processes, and relations in every area of reality.

In order words, ontology is the study of everything and anything. It describes society’s view whether claims or assumptions on the nature of reality, and specifically, whether this is an objective reality that really exists, or only a subjective reality, created in the minds. It is mainly concerned with what exists to be investigated.

Therefore, a realist subscribes to the assumption that the real world is out there and exists independently from society. It supports the argument that the world is made up of objects and structures that have identifiable cause and effect relationships (King et al., 2010).

King et al. (2010) emphasize the need for a philosophical perspective to methodology, because they claim that without a perspective on the nature of social reality, it would be impossible to consider what might count as relevant knowledge in the research process. Thus ontology only becomes relevant when one is not satisfied with knowledge, when what passes for knowledge is patently wrong or absurd (Bhaskar, 2007).

Therefore, according to Bhaskar (2007) ontology refers to a researcher’s position or solution to the question about the nature of the reality under investigation. This assumption about the nature of the world complements the formulation of the research philosophy and so influences the selection of the appropriate research approach and methods.

However, on the opposing side of this argument stands the relativist. The relativists reject such direct explanations, they maintain that the world is far more unstructured and diverse; therefore man’s understands and experiences are relative to their specific cultural and social frame of reference which is open to interpretation (King et al., 2010).
In other words, society has a number of deeply embedded ontological assumptions which will affect perceptions on what is real and whether man attributes existence to one set of thing over another (King et al., 2010).

These underlying assumptions must be identified and considered to ensure the researcher is not blinded to certain aspects of the inquiry or certain phenomena, since they are implicitly assumed, taken for granted and therefore not opened to question, consideration or discussion.

Diverging explanations of existence are apparent within these differing positions. Against that background, the data that would need to be collected to investigate these different versions of reality are not the same. Nevertheless, ontology provides one with a lot of information about the concepts, including their relationships.

When considering that different views exist regarding what constitutes reality, and how that reality is measured, and what constitutes knowledge of that reality. This leads to the subject of epistemology.

4.3.2 Epistemological perspective
Closely coupled with ontology and its consideration of what constitutes reality, epistemology considers views about the most appropriate ways of enquiring into the nature of the world (Easterby-Smith, Thorpe and Jackson, 2008) and what counts as knowledge and what are the sources and limits of knowledge (King et al., 2010; Walliman, 2006).

Questions of epistemology begin to consider the research method, and Eriksson and Kovalainen (2008) specifically discuss how epistemology defines how knowledge can be produced and argued for. King et al. (2010) describe epistemology as the theory or science of the method or grounds of knowledge expanding this into a set of claims or assumptions about the ways in which it is possible to gain knowledge of reality, how what exists may be known, what can be known, and what criteria must be satisfied in order to be described as knowledge.
In other words, it describes a researcher’s thinking and beliefs about the nature of knowledge and knowing, including definitions of knowledge, how knowledge is constructed, and how knowledge is evaluated. Hence it provides a means of establishing what counts as knowledge, and this is central in any methodological approach.

Hatch and Cunliffe (2006) summarise epistemology as knowing how one can know and expand this by asking how knowledge is generated, what criteria discriminate good knowledge from bad knowledge, and how reality should be represented or described.

They go on to highlight the inter-dependent relationship between epistemology and ontology, and how both inform, and depend upon, the other. In considering this link, the need to understand the position of the researcher becomes more obvious. If the researcher holds certain ontological positions or assumptions, these may influence the epistemological choices or conclusions drawn.

Hence, as with ontology, both objective and subjective epistemological views exist. Eriksson et al. (2008) describe an objective epistemology as presuming that a world exists that is external and theory neutral, whereas within a subjective epistemological view no access to the external world beyond one’s observations and interpretations is possible.

Saunders, Lewis and Thornhill (2007) discuss this further, highlighting that certain researchers therefore argue that for data collected from objects that exist separate to the researcher, an external reality is less open to bias and therefore more objective, and that if social phenomena are studied, these must be presented in a statistical, rather than narrative, form in order to hold any authority. This is a position of course that many researchers would challenge and Blaikie (2003) contends that since social research involves so many choices, the opportunity for researcher’s values and preferences to influence the process makes it difficult to ultimately achieve true objectivity.
Consequently, Neuman (2006) indicates that the three contemporary research approaches applied in research study include: the logical positivism approach, the interpretive approach and the critical approach.

4.3.2.1 Logical positivism approach
Commonly applied in natural science, Welman et al. (2005) and Travers (2001) indicate that this school of thought suggests that it is possible to describe the world objectively, from a scientific vantage point. It tries to develop laws that are unanimously applicable or binding (Weiman and Kruger, 2001). The approach emphasizes discovering underlying laws of relationships, careful empirical observations, and value-free research. Neuman (2006) claims that the positivism approach suggests that scholarly activity which seeks to attain the title of science must only conform to the logic of science.

According to Burns et al. (2008), the methods used in this approach include experimental studies, re-analysis of secondary data, structured questionnaires, and structured interviews. Positivist research is likely to be a quantitative research and use’s experiments, surveys and statistics (Burns et al., 2008; Neuman, 2006; Welman et al., 2005).

4.3.2.2 Interpretive approach
According to Neuman (2006), this type of approach simple implies making the ambiguous clear. Travers (2001) indicates that this approach tackles how civil society understands their actions. He asserts that this approach suggests that there are no benefits in working with large data sets. The interpretive approach prefers conducting in-depth ethnographies in one social setting rather than comparative studies based on spending smaller periods in a number of sites.

Denscombe (2002) indicates that the point of this research is to identify things that are unique and peculiar to the subject being studied. Denscombe (2002) claims that those engaged in this type of research are inclined towards specific locations such as a company, an association, a club, a group, a district or an incident. According to Burns et al. (2008) and Travers (2001), the methods used in this approach include ethnography, participant observation, focus groups, and in-depth interviewing which
is generally inductive. The anti-positivist research is also known as qualitative research (Burns et al., 2008; Neuman, 2006; Welman et al., 2005).

### 4.3.2.3 Critical approach

This approach views research as an essential process of inquisition that digs deep to reveal the true structures in the material world with the aim of ensuring change and enabling people to develop a better society. This approach looks beyond the obvious to uncover laws or mechanisms which explain human behaviour. It is centred on empowering people (Neuman, 2006).

According to Neuman (2006), the critical researcher exposes insincerity and investigates conditions in order to encourage grassroots action, suggesting that this approach is based on the opinion that researchers are connected to the people they are researching. It enables people to understand how society functions and methods by which unsatisfactory aspects can be changed. Types of research are discussed in details in section 4.5.

### 4.4 Research design

Research design involves a coherent succession of processes with the intention of connecting the empirical data to a study’s initial research question and eventually to its conclusions (Yin, 2009). It is the preparation of a programme of activities focused towards the systematic assembly, collection, analysing and interpreting of observations. Yin (2009) further states that research design is the detail plan for a research study. He indicates that a research design must resolve four primary questions relative to data and they include:

- What data is required?
- Where will the data be found?
- How will the data be gathered?
- What method will be used to interpret the results?

According to Burns et al. (2008), the selection of a specific design depends primarily on both the nature and the extent of the information needed. They further assert that a research design must seek to acquire dependable, valid measures / observations / data regarding which measurement errors are reduced to their barest minimum.
The case study approach was used for this study, because the focus was on a holistic, in-depth investigation of HS&E practices in the sample area. Figure 4.1 depicts the theoretical plan used in the research process.

**Figure 4.1: The theoretical plan of the research process**

1. **A question is posed.**
   A question arises in the researcher’s mind, which has no known resolution.

2. **It is a matter of words**
   The question is converted into a clearly stated research problem.

3. **It is worth a guess!**
   A series of hypotheses are proposed.

4. **A search is on!**
   A thorough search of literature for ideas that shed light on the problem and for strategies that may help to address it was embarked upon.

5. **Hard data collection.**
   Data collection processes, data that potentially relate to the problem are collated.

6. **Integrating the data.**
   The data are arranged into a logical organisational structure.

7. **The data speak!**
   The data are perused and analyzed to determine their meaning.

8. **It’s either … or …**
   Relevant data which addresses the research problem are separated from those that do not. They either support the hypotheses or they do not.

Source: Leedy and Ormrod (2005)

### 4.4.1 Objectivity and integrity

Opportunities exist in every research process for researchers to be dishonest, unethical or biased. Bias is any influence, manipulation, circumstance or set of situations that separately or together misrepresent the data (Leedy *et al*., 2005). Data are highly
susceptible to distortion because they are delicate and sensitive to unintended influences.

Neuman (2006) suggests that to reduce bias a qualitative researcher should emphasise intimate first-hand knowledge of the research setting and avoid interjecting personal opinion and being sloppy about data collection. Neuman (2006) emphasizes that it is imperative for the researcher to be forthright and open about any personal involvement. The way in which evidence is presented by a qualitative researcher helps create trust.

Quantitative research stresses objectivity and more perfunctory techniques. It stresses honesty as a parallel idea to objective standards in the design, thus ensuring that the study is reliable, plausible and credible. It encourages the principle of replication, adherence to standard methodological procedures, measurement with numbers and the use of statistics to analyse data and therefore focuses on the control or elimination of the human factor.

However, Neuman (2006) states that reliability and validity are salient because constructs are often vague diffuse and not directly observable, but they are two most important considerations in any measurement.

Reliability means the degree to which observed scores are free from errors of measurement. Welman et al. (2005) suggest that reliability is concerned with the integrity of the results and to determine if the findings are reliable it is necessary to ask the questions, will the evidence and conclusions stand up to the closest scrutiny?

Hence the same study should arrive at the same results and findings when carried out following the same procedures (Yin, 2009; Burns et al., 2008).

According to Neuman (2006), reliability of measurement can be increased by:

- Unambiguously conceptualized constructs;
- Use of accurate level of measurement;
- Use of pilot survey,
• Use of multiple indicators.

Validity can be classified in various ways according to Yin (2009), Burns et al. (2008) and Neuman (2006), some of which include:

• Construct validity – is any concept such as honesty that cannot be directly observed or isolated;

• Internal validity – is concerned with the degree of control to which conditions seek to establish a causal relationship, and,

• External validity – is concerned with the extent of domain to which findings can be generalized.

Reliability and the above mentioned types of validity are vital conditions applied to maximize the quality of case study design (Yin, 2009). Some researchers have indicated that distinctions amongst these types of validation are not always clear cut. Hence they suggest that validation should be viewed as a single process of hypothesis testing.

Johnson and Gill (2010) and Burns et al. (2008) report that to enhance the uniformity of findings gathered in research. Findings can be tested by asking the same questions in different ways at different points in the questionnaire. To improve reliability the research survey was designed so that the same questions were asked in different ways (Annexures B and C).

Accurate measurements can be obtained when measurement is consistent. Therefore, in order to achieve validity, there must be reliability. Hence the more valid and reliable measurement instruments are, the more likely they are to draw appropriate conclusions from the information collected.

The research instruments for this study were designed to reflect the above issues and therefore intended to capture all necessary information to accomplish the research. A pilot study in the form of an electronic survey was conducted using the two standard questionnaires (Annexures B and C), presented to a small sample group. The combination of many research instruments is intended to maximise reliability.
Ethical concerns in research are centred on the appropriateness of the researcher’s behaviour relative to the rights of the research matters or individuals who are directly affected by the research (Saunders et al., 2000). This means that the subjects affected by the research must have been given the opportunity by the researcher to give free and informed consent about their participation.

According to Leedy (1993), the use of human subjects in research raises the question of ethical standards and should not go without careful scrutiny. Free and informed consent therefore lies at the heart of ethical research involving human subjects. In this research, all the organisations that form the basis of the study provided consent. No organisation was named and the identities of individuals or groups of people were not disclosed. All subjects in this study are anonymous.

4.5 Types of research
A research study could be classified or viewed from three different perspectives, depending on the approach used to conduct the research.

A research project may be classified as pure or applied research from an application standpoint, or descriptive, correlational, explanatory or exploratory from the perception of objectives and as qualitative or quantitative from the standpoint of the inquiry mode employed (Kumar, 2011).

4.5.1 Qualitative and quantitative methods
When a manuscript is situated within a theoretical frame of references its content is better understood. This can be done using content analysis which consists of stating the research problem, retrieving the text and employing sampling methods, interpretation and analysis.

Subsequently, this technique reflects the frequency with which specific words or phrases occur in the document as a means of identifying its characteristics. The resulting analytical framework makes sense of the data through generated theoretical categories. This method takes both qualitative and quantitative forms (May, 2001). Figure 4.2 depicts the types of research from three viewpoints.
Figure 4.2: Types of research

Two factors which influence the choice of the research strategy that a scholar uses include the scholar’s philosophy of science as it favours one or another method of gathering and presenting information. The second involves the practical limits on the way scholars can operate. This assists researchers in making informed decisions on which method might be better (Neuman, 2006).

Leedy and Ormrod (2005) advise researchers to address four major challenges before deciding on the method to use, including:

- Identifying what data are needed;
- Locating where the data can be found;
- Deciding how to secure the data, and
- The method to be used to interpret the data.

Although qualitative and quantitative researchers hold opposing views, they complement each other as well. Kumar (2011) indicates that a structured approach to
inquiry is classified as quantitative research and an unstructured approach as qualitative research.

Kumar (2011) advises that the aim of the inquiry and use of the findings should govern a researcher’s decision on the choice of qualitative or quantitative approaches. However, Kumar further postulates that depending on the type of study embarked on, a researcher may need to use both qualitative and quantitative approaches in a study because such approach benefits from the advantages associated with each of the methods while at the same time avoiding the weaknesses of each.

In other words, the weaknesses of the one method are compensated for by the strengths of the other. A summary of the main differences between qualitative and quantitative research is presented in Table 4.1.

**Table 4.1: Differences between the quantitative and qualitative research approaches**

<table>
<thead>
<tr>
<th>Quantitative Research</th>
<th>Qualitative Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>The purpose is to explain and predict, to confirm, validate and test theory.</td>
<td>The purpose is to describe and explain, to explore, interpret and build theory.</td>
</tr>
<tr>
<td>Measures are systematically created before data collection and are standardized.</td>
<td>Measures are created in an ad hoc manner and are often specific to the individual setting or researcher.</td>
</tr>
<tr>
<td>The data are numeric, representative, and are of a large sample. And the instruments used are standardized. Replication is frequent.</td>
<td>The data is textual in the form of words from documents, non-standardized observation and/or interview. The sample size is small. Replication is very rare.</td>
</tr>
<tr>
<td>Concepts are in form of distinct variables.</td>
<td>Concepts are in the form of themes and categories, motifs, generalizations and taxonomies. Concepts can be interpreted in a number of ways.</td>
</tr>
<tr>
<td>Theory is largely causal and is deductive.</td>
<td>Theory can be causal or non-causal and is often inductive.</td>
</tr>
<tr>
<td>The findings are communicated using</td>
<td>The findings are communicated using words,</td>
</tr>
</tbody>
</table>
4.5.2 Qualitative Research

Qualitative research depends on interpretive and critical approaches to social science. Welman et al. (2005) agree with Kumar (2011) that this type of research is an approach rather than a particular design or set of techniques. They suggest that it is a canopy casing a range of interpretive techniques seeking to explain, decipher, translate and come to terms with the meaning of naturally occurring phenomena in the social world.

Burns et al. (2008), Neuman (2006), Welman et al. (2005) and Leedy et al. (2005) assert that this type of research focuses on real life events which occur in the real world and it involves studying the phenomena in all their complexity. If a phenomenon being studied has various dimensions and layers, it must be portrayed in its multifaceted form.

When individuals and phenomena are studied in their natural settings researchers are able to gain a better understanding of them. Kumar (2011) provides examples of qualitative research to include describing an observed situation, the historical enumeration of events, an account of the different opinions people have about an issue, and a description of the living conditions of a community.

Neuman (2006) asserts that the qualitative researcher applies logic in practice and follows a nonlinear and cyclical path. Intimate first-hand knowledge of the research settings is stressed and the researchers integrate themselves into the phenomena they are studying. This ensures the researcher gains an intimate insight and adds a human perspective to understanding the phenomena being studied more fully. A huge volume of detailed documentation and written notes and recordings may be collected.

Despite the fact that few procedures or terms are standardized, the researcher needs to use more flexible methods to investigate subjective data. This is achieved by developing a set of strategies and tactics in order to organise, manage, and evaluate
the research (Neuman, 2006). Leedy et al. (2005) indicate that the choice of the qualitative approach is appropriate when the research study in general serves one or more of the following purposes: descriptive method; exploratory method, and explanatory method.

4.5.2.1 Descriptive method
This method is used to reveal the nature of certain situations, settings, processes, relationships, systems or people. This type of research involves either identifying the characteristics of an observed phenomenon or exploring possible correlations among two or more phenomena. This type of research approach can be used successfully in the description of groups, communities or organisations.

The two most significant goals of this type of research are to explain phenomena and to predict behaviour Neuman (2006). Hence it enables human behaviour to be explained in businesses, groups, and communities and by explaining human behaviour it can be controlled.

Babbie and Mouton (2001) and Neuman (2006) assert that the aims of a descriptive research project include to:

- Provide a picturesque and comprehensive view;
- Trace fresh and contemporary data which will stimulate fresh reasoning;
- Clarify a chain of steps or stages;
- Generate a set of categories or catalogue types;
- Create a causal relationship or system, and
- Present the basic setting or milieu of events.

4.5.2.2 Exploratory method
This method involves probing a new topic / angle of an issue or event. It seeks to build theory rather than test it, and can also fill in a gap in existing theory Neuman (2006). It enables a researcher to gain new insights about a particular phenomenon. Babbie et al. (2001) and Neuman (2006) suggest that the aims of an exploratory research method include to:

- Construct a representation of events;
• Develop new concepts or theoretical perspectives, and hypotheses;
• Recognize the fundamental details, scenery and concerns;
• Formulate and propose questions for potential research;
• Develop new thought, conjectures or hypotheses;
• Discover the problems that exist within the phenomena;
• Determine the feasibility of conducting research, and
• Develop techniques for measuring and locating future data.

4.5.2.3 Explanatory method
This method is used in situations where an issue or event is already known and a
description is made. The desire to know ‘why’ it happened is the purpose of
conducting an explanatory research project. It allows a researcher to test the validity
of certain assumptions, claims, theories or generalization within real-world contexts.
It develops from existing platforms of both descriptive and exploratory methods and
proceeds to identify the reasons why something occurs. According to Babbie et al.
(2001) and Neuman (2006), the aim of this method includes to:
• Test a theory’s predictions or opinions;
• Expand and augment a theory’s explanations;
• Broaden a theory to new issues or topics;
• Support or refute an explanation or prediction;
• Link issues or topics with a general principle, and
• Determine which of several explanations is best.
The qualitative researcher must observe without affecting that which is being
observed, and keep his or her expectations under control. The weakness of this
research method is its lack of control of bias and its non-representative nature (Miller
and Brewster, 2003).

4.5.3 Quantitative research
While the qualitative research method supports discovery, exploratory and inductive
reasoning, quantitative research, on the other hand, supports deductive reasoning and
analysis. Deductive designs commence with an unambiguous abstract structure
developed from existing speculation and models. It requires the formulation of
specific research hypotheses which will ultimately lead to a theory-building exercise.
It describes a technical research procedure and a known data collection instrument, such as random sampling, and Likert scaling. The fixed alternative questionnaire is used to collect the data. The hypotheses are accepted or rejected and a causal relationship between variables is established (King et al., 2010).

Quantitative researchers make better sense of the world using numbers which are interpreted using statistics. The emphasis is that research must be limited to what can be observed and measured objectively (Welman et al., 2005). Kumar (2011) considers that the major function of statistics is to act as a test to confirm or contradict the conclusions drawn on the basis of the researcher’s understanding of analysed data.

Quantitative research describes relationship among variables mathematically and the subject matter is, as in the natural sciences, treated as an object (Neuman, 2006). It emphasizes the need for an extremely structured, formal and systematic approach. Neuman (2005) suggests a linear research trail, which proceeds in an unambiguous, rational and systematic, gradual straight line. A quantitative research project would usually test the most important causal links to be found in the research domain. This relationship between variables is usually expressed as a hypothesis, and hypotheses are tested to address the research problems or to find empirical support for a theory (Neuman, 2006). The major differences between inductive and deductive research are provided in Table 4.2 below.

### Table 4.2: Deductive design versus inductive design

<table>
<thead>
<tr>
<th>Deductive design</th>
<th>Inductive design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravitates from theory to data</td>
<td>Gravitates from data to theory</td>
</tr>
<tr>
<td>Commonly used in natural sciences</td>
<td>Common to social sciences</td>
</tr>
<tr>
<td>Method is standardized and highly</td>
<td>Method is flexible and less structured</td>
</tr>
<tr>
<td>structured</td>
<td></td>
</tr>
<tr>
<td>Explains causal relationship between</td>
<td>Explanation is based on understanding of meanings</td>
</tr>
<tr>
<td>variables</td>
<td>attached to events by human beings (focus on meaning)</td>
</tr>
<tr>
<td>Select samples of sufficient size to</td>
<td>Pay less attention to the need to generalize</td>
</tr>
<tr>
<td>generalize conclusions</td>
<td></td>
</tr>
<tr>
<td>Reliability is high</td>
<td>Reliability is low with high validity</td>
</tr>
<tr>
<td>Formulate hypotheses and test them</td>
<td>Develop ideas through induction from data</td>
</tr>
</tbody>
</table>

Source: Saunders et al. (2007)
4.6 Choosing the most appropriate research method

According to Yin (2009), every research method can be used for all three purposes – exploratory inquiry, descriptive inquiry, and explanatory inquiry. However, the main objective is to avoid gross misfit. Yin (2009) suggests that the case study is used as a research method, to add to knowledge of an association, a community, human being, company, or political, social, and related phenomena.

He further claims that the distinctive need for case studies arises out of the desire to understand complex social phenomena. This permits researchers to maintain the holistic and essential characteristics of real-life events such as the organisation and management process, maturation of industries and small group behaviour. This affirms the basis for the choice of the case study research method for this study.

Yin further suggests that when relevant behaviours cannot be manipulated it is preferable to use a case study to examine current events. The case study involves direct observation of the events being studied and interviews of the persons involved in the events and deals with a full variety of evidence, documents, artefacts, interviews and observations. Yin (2009) goes further to define a case study empirical examination as follows:

- One where an in depth investigation of a modern-day phenomenon is studied within its real-life milieu, especially when the borders between phenomena and milieu are not visibly apparent;
- One where results relies on multiple sources of evidence, with a need to converge in a triangulating fashion, and
- One which profits from previous development of theoretical propositions to guide data collection and analysis.

4.6.1 Triangulation

Welman et al. (2005) indicates that relative to conducting a case study three major aspects which should be considered include: firstly, a clear demarcation of the case, secondly, a proper description of what is being observed and an inductive search for recurring patterns and consistent regularities; thirdly, triangulation should be used to corroborate findings as a means to improve accuracy.
Neuman (2006) thinks that screening an observable occurrence from different angles or viewpoints gives a true picture of the phenomena being observed. In line with this argument Leedy et al. (2005) suggest that triangulation enables a researcher to combine various methods such as informal observations in the field, conducting in-depth interviews and questionnaires which all aid in enhancing a research study.

Yin (2009) goes further to assert that a significant strength of the case study method is the prospect of using several diverse sources of substantiation. Yin (2009) and Neuman (2006) assert that possible types of triangulation include:

- Triangulation of measurement involves the researcher taking multiple measures of the same phenomena. This enables researchers to see all aspects clearly;
- Triangulation of data involves a researcher conducting interviews, gathering documents or observing people’s behaviour;
- Triangulation of theory involves a researcher using multiple theoretical perspectives in the planning stages of the research or when interpreting the data, and
- Triangulation of methods is a methodological triangulation, for instance mixing both qualitative and quantitative methods of research and data.

The most significant advantage of the use of the case study is that it allows an investigator to develop converging lines of inquiry. Figure 4.3 depicts the approach adapted for the study as postulated by Yin.

**Figure 4.3: Convergence of evidence**

![Convergence of evidence diagram](Source: Yin (2009))
This study explores the HS&E practices within the oil and gas industry in Nigeria with a focus on developing a strategic model for HS&E management.

The scenario of the problem is appropriate to the quantitative research method as it supports deductive reasoning and analysis. This research study embraces distinct strategies to unravel the stated research problems through a defined logical process which includes investigation, examination and reconstruction.

A research design commences with a clear theoretical structure developed from existing theory and models. The study required the formulation of precise research hypotheses leading to a theory building exercise. Questionnaires are used to collect data, the hypotheses are accepted or rejected and causal relationships between variables established. Focusing on the problem and sub-problems of the study, and how and why type questions are asked.

Qualitative research method in the form of interviews, observations and pilot surveys was used to further enhance this study by supporting the outcomes of the hypotheses. The primary focus of the inductive approach is HS&E management processes. Triangulation of methods was used because the inductive and deductive approach is combined to ensure that the data from the questionnaires is tested in more than one way with the theory.

4.7 The choice of the use of a case study approach

All theoretical schools of thought have both advantages and disadvantages but the acceptance of a specific interpretation or opinion rests on the situation or milieu of the research. This study keys into the diversities of the hypothetical standpoints which can be brought to bear on the inquiry as indicated in Sections 1.3 and 1.4.

If the idea of knowing is taken as the basis for elaborating on the difference between qualitative and quantitative research, then it is possible to make clear the fundamental methodological issues that underpin the justification for a research approach.

A complexity of information is required to shed light on HS&E implications for Nigeria’s oil and gas industry. The study is conducted under the discipline of
construction management which addresses three main streams, namely management, economics, and science and technology. The combined approach is considered suitable for the study.

However, the justification for the adoption of the case study position is presented as follows. Ontologically, the research is an objective reality that really exists. Epistemologically, the research is objectivist and positivist. It is positivist because the problem being investigated is an objective social reality requiring observation and review of distinct and identifiable objects and phenomena.

The data collected are separate from the researcher in external reality, are less open to bias and therefore more objective, and the study area is a social phenomenon presented in a statistical, rather than narrative format.

However, ontologically, the research is realistic because the objective of developing an HS&E management model with identifiable variables provides some sort of evidence to support generalizations about the performance of the oil and gas industry.

According to Yin (2009) case study research excels at ensuring an understanding of a complex issue or object and can extend experience or add strength to what is already known through previous research. Yin (2009) reports that researchers have used the case study research method for many years across a variety of disciplines, to examine contemporary real-life situations such as the oil crisis in Nigeria and provide the basis for the application of ideas and extension of methods.

A case study is geared towards understanding the uniqueness and peculiarity of a single bounded system such as HS&E, typical of a social nature for instance a single industry such as oil and gas or an organisation such as MNOC in all its complexity (Welman et al., 2005).

Since this increases the complexity of the study and requires multiply sources and techniques in the data gathering process, research instruments, interviews and observations and field work were all used to gather data.
However, Yin (2009) posits that case study research involves the application of quantitative research methods to non-probability samples which provide results that are not necessarily designed to be generalizable to wider populations. Yin (2009) asserts that case studies are the preferred strategy when ‘how’ and ‘why’ questions are being posed about a modern-day incident because they are concerned with providing credible representations of reality and so give the reader a sense of being there.

Yin further shows that a mix of both qualitative and quantitative evidence which does not necessarily often require the direct and detailed observational evidence marked by other forms of qualitative research is applicable to case studies. Table 4.3 depicts the relevant situations for various research methods.

**Table 4.3: Relevant situations for different research methods**

<table>
<thead>
<tr>
<th>Method</th>
<th>Form of Research Question</th>
<th>Requires control of behaviour events?</th>
<th>Focuses on contemporary events?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>how, why?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Survey</td>
<td>who, what, where, how, many, how much?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Archival Analysis</td>
<td>who, what, where, how many, how much?</td>
<td>No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>History</td>
<td>how, why?</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Case Study</td>
<td>how, why?</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Source: Yin (2009)

According to Yin, the five components of a research design, which are especially important for a case study include:

1. A research problem;
2. Its intention, if any;
3. Its element(s) of analysis;
4. The rational linking the data to the prepositions, and
5. The benchmark for interpreting the results.

Welman et al. (2005) reinforce the use of case studies as a single unit of analysis which includes individuals, groups or organisations is being studied intensively. Hence a case study directs towards understanding the uniqueness and idiosyncrasy of a particular case in all its complexity. They encourage the need to conduct fieldwork investigation as it helps to understand the natural circumstances of the specific case.

4.8 Models and modelling
This research proposes to attempt to develop a strategic HS&E management model which focuses on a holistic approach to HS&E management.

According to Ornek (2008), in broader terms a model is an illustration of a phenomenon, an entity, or impression. From a scientific point of view a model is the product of representing an object, phenomenon or idea as the target with a more familiar one, the source. The model can only relate to some properties of the target. Some aspects of the target must be excluded.

Models and modelling are cognitive tools for scientific inquiry. Models should be physical, conceptual, and measurable. Therefore, Pidd (2009) defines a model as an outward and overt image of a fragment of reality as seen by those who aspire to use it to comprehend, to transform, to manage and to regulate that part of reality. He asserts that, it is important to understand the limitation of model building and a prototype used for a model may or may not be a simplification of but an approximate representation of some aspect of reality.

The intended purpose of a model determines how complicated it should be. However, Pidd suggests that models should be as simple as possible, yet should be valid and useful for their intended purpose. Various challenges are experienced when designing a model, one of which is determining whether an element of a model is necessary, even though this also depends on its intended purpose since it takes perfect hindsight.
to determine that a model adequately addresses the reality being modelled (Pidd, 2009).

A further issue is that of complexity in modelling, which involves the level of simplicity required, and whether it can be determined in advance. Finally, there is the issue of differentiating between the real and imaginary parts of the model. Unfortunately this is subjective, since one person’s reality may be another’s imagination. Models should be simple since they are entirely explicit and can be tested by other people (Pidd, 2009).

The point of a model is to make explicit or concrete whatever aspect of reality is being investigated. In some cases the model is being developed in order to gain some understanding about how the real world operates. Therefore, the model becomes a theory that tries to explain what has been observed to occur. Pidd (2009) indicates that the task of a modeller is to take the ill-defined and implicit views of reality and cast them in some form well enough defined to be at least understood and argued over by other people.

4.9 Research motive

According to Neuman (2006), the motive behind a research study is dependent on what the researcher is trying to accomplish. As mentioned previously in 4.9, Yin (2009) claims that a case study investigation can be applied to four different applications. These include:

- Explanatory – the presumed causal links in real-life interventions that are too complex for the survey or experimental strategies; or that explain why something happens;
- Descriptive – an intervention and the real-life context in which it occurred; or to describe a phenomenon;
- Exploratory – explore a new angle to a topic, and
- Enlightenment – those situations in which the intervention being evaluated has no clear, single set of outcomes.
4.9.1 The motive for this research study

This study investigates the factors that are propelling organisations towards continuous improvement with an analysis of the theory on various factors which influence the environment where organisations operate, the impact of technology and innovation, contemporary HS&E management practice, the quality of HS&E practices and best operating practices in Nigeria, as well as a review of the country's oil and gas industry.

A further goal is to develop a model which focuses on how the oil exploration sector should work with a strategic HS&E model. This is the basis for the study and the intention of this project is to describe the various strategies and processes used by selected oil and gas organisations to explain the reasons and consequences of existing HS&E practices and requirements.

4.10 Research strategy

Leedy et al. (2005) suggest that a research strategy is the mechanism used by a researcher to collect, collate and interpret data. Research includes many different activities with each falling in one of three main clusters: tentative explaining, observing and testing rival views against data. All three are required in most research. The main aim is to study a representative number of events or people with a view to generalizing the results of the research project to a defined population.

Tentative explanation assists in making sense out of diverse observations and guides in making better observations. Hence it constitutes a ‘theory’. Several theories can be used to explain many events. Collecting data helps in deciding which theory best fits reality. Hence for causation to be better understood, the data must come into contact with theory. However, observing with a theory in mind becomes causal research by joining a cause to an effect. Lastly, the research circle comparison of the causal idea is made with the observations to establish if the theory fits, or if another theory fits better.

The study included the following activities:

- Designing and developing a research instrument;
• Establishing a relationship with social science researchers who have conducted extensive research relative to the oil crisis in the Niger Delta region;
• Conducting one-on-one interviews with target respondents;
• Conducting a pilot survey with seven potential respondents to test the questionnaires suitability;
• Revising the research instrument to incorporate comments from potential respondents as well as the promoter’s comments;
• Distributing the questionnaire using e-mail, along with a covering letter explaining the purpose of the study and requesting the respondents to participate in the survey;
• Following up non-respondents by e-mail and telephone after the two weeks from the date when they should have received the questionnaire;
• Conducting a physical visit to ten host communities to gather more data such as pictures and observations;
• Compiling and analysing the questionnaire results, and
• Providing feedback to respondents based on the questionnaire results

4.11 Sample population
The sample population target for this research investigation consisted of MNOCs duly registered and operating within Nigeria. The population was chosen on the basis that they represent the major foreign oil exploration and production companies with joint venture operations in partnership with the Nigerian Federal Government.

A stratified random sampling method was used to determine this population, whereby stratification according to the following characteristics was used:
• Their operations involved a broad spectrum of oil and gas activities;
• Their operations are international;
• They operate operational offices in more than one core oil producing region of Nigeria;
• Their parent office is located in various countries in Europe and the United States;
• They import the technology for their activities, and
• They operate in other oil producing countries around the world.
The population of respondents is homogeneous in nature. The population sample includes professionals at functional / line management level from diverse disciplines including HS&E managers, geologists, engineers, project managers, consultants, and other relevant professionals. The population for the pilot study comprised seven respondents, and the objective of these surveys was to test the ease of use of the questionnaires and assist the researcher in understanding the concerns of the people who were being questioned and how they might interpret particular questions.

This size was determined based on the willingness of respondents approached to participate in the survey. The managers were approached during face-to-face interviews to identify key officials within their organisations. The snowball sampling method was used to select the number of managers for the study. This resulted in the identification of one hundred and ten respondents for the questionnaire in Annexure B and twenty-five for the questionnaire in Annexure C.

Hence the criterion is based on a fit for purpose factor (May, 2001). The rationale behind the decision to use this sample size was based on May’s (2001) assertion that a “large, poor quality sample, which does not reflect the population characteristics, will be less accurate than a smaller one that does”. The respondents are able to clarify and deepen understanding relevant to the focus of the study. Figure 4.4 depicts the sample stratum of the population.

**Table 4.4: Sample stratum**

<table>
<thead>
<tr>
<th>Type</th>
<th>Proposed</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td><strong>Annexure B</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineers</td>
<td>50</td>
<td>46.0</td>
</tr>
<tr>
<td>Geologists</td>
<td>30</td>
<td>27.0</td>
</tr>
<tr>
<td>Project managers</td>
<td>30</td>
<td>27.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>110</td>
<td>100</td>
</tr>
<tr>
<td><strong>Annexure C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HS&amp;E functional managers</td>
<td>3</td>
<td>12.0</td>
</tr>
<tr>
<td>HSE line managers</td>
<td>22</td>
<td>88.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>25</td>
<td>100.0</td>
</tr>
</tbody>
</table>
4.12 Questionnaire design

The study used two questionnaires for data gathering, the first survey being relative to the business environment and the second relative to HS&E issues. This is relative to the sub-problems and hypothesis highlighted in Sections 1.3 and 1.4. A 5-point Likert type scale was used to determine organisational behaviour relative to magnitude, frequency and degree type questions, including an unsure position; this was to increase reliability. This is based on Church, Waclawski and Kraut’s (2001) and Alwin’s (2010) assertions that a five category scale appears superior for unipolar assessments.

The research study was conducted in four stages using several tools: a pilot survey, the actual empirical survey, observations and in-depth interviews. Two empirical surveys were planned, one for business environment / technology and innovation and the second one for HS&E management practice covered in the literature review. After the pilot survey was conducted the questionnaire was re-worded to address respondents’ comments and suggestions.

4.13 Data Collection

As previously mentioned, the first survey was administered to functional / line managers and professionals of various units which included engineering, exploration, production and corporate services. The second survey was administered only to HS&E managers in functional and line management positions. The survey is designed mainly to address HS&E issues and this explains the decision to survey only managers involved in HS&E activities for the second questionnaire. Table 4.5 depicts the data collection schedule

Table 4.5: Data collection schedule

<table>
<thead>
<tr>
<th>Instrument / Tool</th>
<th>Date / Duration</th>
<th>Responsibility</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation / walk around</td>
<td>05 October 2010 - 22 December 2010</td>
<td>Candidate</td>
<td>Photographs taken. Interaction with host communities and members of JTF</td>
</tr>
<tr>
<td>Semi-structured</td>
<td>10 November 2010 -</td>
<td>Candidate</td>
<td>Interaction with</td>
</tr>
</tbody>
</table>
During the pilot study the primary and significant feedback received from the respondents was the perceived sensitive nature of the questionnaire, which respondents foresaw may constitute a challenge when conducting the actual survey. At this stage the respondents were informed that a covering letter explaining the purpose of the questionnaire would be sent with the questionnaire including an assurance of anonymity for the expression of strongly held views.

Respondents were then willing to participate, hence a snowballing sampling technique was used where an initial contact with a member of the population was made and they led the researcher to other members of the same population (May, 2001). However, this affected the size of the sample population. The questionnaires were e-mailed accompanied by the covering letter (Annexure A).

Visits to host communities where operational offices are situated were conducted in ten different communities. The communities were chosen based on their strategic locations relative to oil and gas exploration, two of the communities are host to a minimum of 130 oil wells, two are host to two major gas plants, three are host to at least one flow station, and three are alleged to be used as access route for oil bunkering ships and illegal arms and weapons trading activities by arms dealers and militia groups. The purpose was to provide a greater wealth of information, an assertion reinforced by Welman et al. (2005).
The researcher set the general theme of discussion during the in-depth interview and further questions were posed as they came up in the course of the interaction. The purpose was to collect information from multiple sources but aimed at corroborating the same facts and phenomena and to establish converging lines of inquiry since the intention was to understand the uniqueness and idiosyncrasy of the particular case in all its complexity. Table 4.6 depicts the sample per collection instrument.

### Table 4.6: Sample per collection instrument

<table>
<thead>
<tr>
<th>Collection instrument</th>
<th>Proposed</th>
<th></th>
<th>Actual</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td><strong>Empirical survey on business environment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Questionnaires</td>
<td>110</td>
<td>96.0</td>
<td>67</td>
<td>58.0</td>
</tr>
<tr>
<td>Interviews</td>
<td>5</td>
<td>4.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>115</strong></td>
<td><strong>100.0</strong></td>
<td><strong>67</strong></td>
<td><strong>58.0</strong></td>
</tr>
<tr>
<td><strong>Empirical survey on HSE Issues</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Questionnaires</td>
<td>30</td>
<td>60.0</td>
<td>15</td>
<td>30.0</td>
</tr>
<tr>
<td>Interviews</td>
<td>10</td>
<td>20.0</td>
<td>5</td>
<td>10.0</td>
</tr>
<tr>
<td>Observations</td>
<td>10</td>
<td>20.0</td>
<td>10</td>
<td>20.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td><strong>100.0</strong></td>
<td><strong>30</strong></td>
<td><strong>60.0</strong></td>
</tr>
</tbody>
</table>

### 4.14 General approach

The methodology applied for this research study was discussed earlier in this chapter. The empirical data collection was done by means of questionnaires and interviews. The secondary data used in this research project was obtained from various local and international sources in various forms, such as articles, research publications, books, and reports, the most predominant being international books originating in America and Europe. The primary data used in this research project were acquired from observations by way of in-depth interviews, site visits, walking around, questionnaires and consultations.

Of the 110 participants in the first survey (Annexure B) only 69 returned the completed surveys. Two surveys were far too late. Thus only 67 completed surveys were used in the study. Of the 25 participants in the second survey (Annexure C) only 15 returned the completed surveys thus only 15 completed surveys were used in the
study. The actual survey also in the form of an electronic survey questionnaire (see Annexures B and C) was forwarded under covering letters (Annexure A).

Five MNOCs were approached to participate in the survey, but one MNOC declined, no feedback was received from one, and three expressed interest in participating. While following up on the reason for declining and lack of feedback, one MNOC indicated that they had strict instructions from their parent organisation not to participate in any survey until further notice. The second MNOC indicated that due to security concerns they are unable to participate. A contact person was identified in each of the three MNOCs that participated in the survey who subsequently acted as liaison between the researcher and the respondents.

Although there were 110 respondents identified to participate in the Annexure B survey the response of 67 (58%) was deemed adequate for the purpose of data analysis especially considering the length of the questionnaires. In regard to Annexure C, of the 25 respondents identified to participate in the survey, the response rate of 15 (60%) was deemed adequate for the purpose of data analysis.

During the follow-up on outstanding questionnaires the following problems and excuses were given as to why questionnaires had not been completed and returned:

- Too busy right now – will look at questionnaire on my return from offshore assignment;
- Re-send the questionnaire in hard copy;
- Sudden increase in workload has made it impossible to complete the questionnaire, and
- Some information required is too sensitive for us to reveal.

The tight 30-45 minute time constraints under which interviews with company heads of departments, HS&E / security managers were conducted with three HS&E departmental heads and two security managers did not prevent the collection of data. This yielded a favourable outcome with some interesting observations and facts that would not have surfaced from any survey questionnaires. These interviews were semi-
structured to gain a better understanding and the focus was on current practices, concepts, themes and actual versus make-believe.

The site observations / visits and walking around were done at specific locations housing infrastructures / installations such as flow stations, gas plants, rig sites, pipeline networks and security posts to compare specific project processes and the reality of security threats faced by workers. This yielded interesting observations for comparison purposes. These observations support the interviews conducted from an actual versus theoretical perspective. The researcher was allowed access into some of these facilities on the condition that no cameras were allowed into the facilities. All the facilities are fenced and heavily guarded for security purposes. The researcher was only permitted to observe and walk around under the supervision of a site supervisor but permission was not granted to interact with site workers.

4.15 Conclusions
The methodology used to conduct this research has been explained in this chapter. The justification for the choice of the use of a case study research, the research approach, style and methods have also been clarified. The sample population, data collection process and challenges experienced have also been highlighted. The research paradigm strategies and issues relative to reliability, validity and limitations of this research have been discussed. The chapter also provided the philosophical basis for the research. The next chapter presents the units of analysis of the case observed for this research.
CHAPTER 5

DATA PRESENTATION AND DISCUSSION

5.1 Introduction

This chapter presents the results of the data analysis and interpretation. The first section presents the results from the Phase One questionnaire survey (Annexure B) and the second section presents the results from the Phase Two questionnaire survey (Annexure C). The results from testing the hypotheses are also presented. Exploratory interviews conducted with senior staff in the department of HS&E management whose functions centre on the management and monitoring of HS&E processes and systems are also presented. Finally the model which focuses on a strategic model for HS&E management is also presented.

5.2 Analysis of phase one questionnaire data

5.2.1 Biographical information

5.2.1.1 Title and capacity

A total of 67 managers in the employ of MNOCs responded to the survey. Table 5.1 indicates that 45% of respondents are currently working at operational management level, 37% at middle, and 18% at top. Operational management includes construction site engineers, process engineers, drilling engineers, geologists, well operating engineers and supervisors. Middle management includes project managers and heads of department, and top management includes deputy managing directors and general managers. The level respondents are currently working at is an indication that the data obtained from them can be relied upon.

Table 5.1: Levels of management respondents are currently working at

<table>
<thead>
<tr>
<th>Level</th>
<th>Response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational</td>
<td>45.0</td>
</tr>
<tr>
<td>Middle</td>
<td>37.0</td>
</tr>
<tr>
<td>Top</td>
<td>18.0</td>
</tr>
</tbody>
</table>
5.2.2 Disciplines of respondents

Table 5.2 indicates the disciplines of respondents. 30% are project managers, 48% are engineers, and 22% are geologists. The discipline of the respondents is a further indication that the data obtained from them can be relied upon.

Table 5.2: Discipline of respondents

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineers</td>
<td>48.0</td>
</tr>
<tr>
<td>Project managers</td>
<td>30.0</td>
</tr>
<tr>
<td>Geologists</td>
<td>22.0</td>
</tr>
</tbody>
</table>

5.2.3 Scale of respondents’ organisational operations

Table 5.3 indicates organisations’ scale of operations. It is notable that only MNOCs participated in the survey and hence their scale of operations is 100% international. Their parent organisations are all situated in Europe and the United States of America.

Table 5.3: The scale of respondents’ organisational operations

<table>
<thead>
<tr>
<th>Scale of operations</th>
<th>Response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>0.0</td>
</tr>
<tr>
<td>National</td>
<td>0.0</td>
</tr>
<tr>
<td>International</td>
<td>100.0</td>
</tr>
</tbody>
</table>

5.3 Business Environment and Strategic Management Influence on Organisation Practice

5.3.1 Importance of business environment approach

Table 5.4 indicates the importance of business environment approaches to respondents’ organisations in terms of percentage responses on a scale of 1 (not important) to 5 (very important), and a mean score (MS) ranging between 1.00 and 5.00. It is notable that all the MSs are above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive the approaches to
be important. However, all the approaches have MSs > 4.20 ≤ 5.00, which indicates that the respondents can be deemed to perceive the approaches to be between important to very important / very important.

The relatively high MSs indicates the significance of the business environment factors. However, conducting a business environment analysis as a basis for major oil and gas projects is the least significant. The probable reason for this may be due to the fact that oil and gas projects are selected and executed for their strategic emphasis and priority system. This is to ensure that Nigeria meets its OPEC crude oil production quota.

**Table 5.4: Importance of business environment approach**

<table>
<thead>
<tr>
<th>Approach</th>
<th>Unsure</th>
<th>Not important…Very important</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business environment analysis</td>
<td>0.0</td>
<td>0.0</td>
<td>5.3</td>
<td>43.9</td>
</tr>
<tr>
<td>Conducting business environmental analysis as a basis for major projects</td>
<td>0.0</td>
<td>0.0</td>
<td>5.3</td>
<td>49.1</td>
</tr>
</tbody>
</table>

**5.3.2 Extent to which organisations address aspects relative to their business environment**

Table 5.5 indicates the extent of management assessment of the business environment in terms of percentage responses on a scale of 1 (never) to 5 (always), and a MS ranging between 1.00 and 5.00. It is notable that all the MSs are above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive the business environment to have been assessed. However, three (50%) of the aspects have MSs > 3.40 ≤ 4.20, which indicates that the respondents can be deemed to perceive the aspects to be addresses between sometimes to often / often. Furthermore, the last three ranked aspects have MSs > 2.60 ≤ 3.40, which indicates that the respondents can be deemed to perceive the aspect to be address between rarely to sometimes / sometimes.
The above average MSs achieved suggest that procedures and systems exist as tools for conducting the business environment assessment. In other words, the MSs could be interpreted to mean that the majority of the respondents acknowledge that their organisations mission appropriately reflects the corporate environment and their organisation analysis its business environment situation. In addition, while the MSs relative to evaluating and implementing business environment analysis, and comprehensive assessment of threats and opportunities during the business environment analysis process may be deemed to be above average, they nevertheless indicate that MNOCs need to improve their abilities in this area. This assumption is supported by the perceived lack of a purposeful assessment format for assessing its business environment reflected in the choice of the existence of a proper functioning business environment scanning system as the least significant aspect by respondents.

Table 5.5: Extent to which organisations address various aspects relative to the business environment

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Unsure</th>
<th>Never</th>
<th>Always</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisational mission appropriately reflects the business organisation environment</td>
<td>0.0</td>
<td>0.0</td>
<td>8.3</td>
<td>21.7</td>
<td>46.7</td>
</tr>
<tr>
<td>Analysis of its business environment situation</td>
<td>0.0</td>
<td>7.9</td>
<td>3.2</td>
<td>25.4</td>
<td>49.2</td>
</tr>
<tr>
<td>Evaluating and implementing its business environment analysis process</td>
<td>9.5</td>
<td>1.6</td>
<td>1.6</td>
<td>50.8</td>
<td>25.4</td>
</tr>
<tr>
<td>Thoroughly considers threats and opportunities during the business environmental analysis process</td>
<td>0.0</td>
<td>6.4</td>
<td>7.9</td>
<td>36.5</td>
<td>38.1</td>
</tr>
<tr>
<td>Proper forecasting during the business environment analysis process</td>
<td>0.0</td>
<td>11.4</td>
<td>8.6</td>
<td>34.3</td>
<td>42.9</td>
</tr>
</tbody>
</table>
5.3.3 Frequency at which organisations monitor the business environment

In determining the frequency at which organisations monitor the business environment. It is notable that all the respondents indicate that the business environment is monitored annually, but added to that 90% of the respondents indicated that their organisation also monitors the business environment every quarter. However, 10% indicated that their organisation monitors their business environment at times other than annually and quarterly.

The probable reason for this is the highly risky nature of the oil and gas industry and growing world demands for energy and competition for natural resources globally. The level of risk increases and organisations are compelled to explore for natural reserves in bleak, isolated and sometimes inimical locations. This will result in competition over energy sources.

5.3.4 Business environment factors analysed by organisations

Table 5.6 indicates the extent to which various business environment factors are analysed by respondents’ organisations in terms of percentage responses on a scale of 1 (never) to 5 (always), and a MS ranging between 1.00 and 5.00. It is notable that nine (90%) of the factors have MSs above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive the business environment factors to have been analysed. However, the first to sixth ranked (60%) factors have MSs > 3.40 ≤ 4.20, which indicates that the respondents can be deemed to perceive the factors to be analysed between sometimes to often / often. Furthermore, the bottom four ranked factors have MSs > 2.60 ≤ 3.40, which indicates that the respondents can be deemed to perceive the factors to be analysed between rarely to sometimes / sometimes.

The above average MSs suggest that there is major scope for improving the assessment process for the business factors particularly in terms of socio-cultural,
ecology and leadership factors. Technology and innovation is the most significant factor. The probable reason for this is that the world’s stock of new technologies is sourced from a few developed nations. In addition, ecology is the ninth most significant factor. The probable reason for this may be the result of the ineffectiveness of environmental agencies in Nigeria and their inability to enforce environmental standards. The implication will be inability to sustain production quota, environmental degradation and indiscriminate demands for compensation by host communities. Finally, the MS relative to leadership is an area of weakness identified in the study. The findings imply that, leadership is not considered a strategic business environment factor.

Table 5.6: Extent to which business environment factors are analysed

<table>
<thead>
<tr>
<th>Factor</th>
<th>Unsure</th>
<th>Never………………..</th>
<th>Always</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology and innovation</td>
<td>0.0</td>
<td>0.0</td>
<td>2.9</td>
<td>22.4</td>
<td>50.8</td>
</tr>
<tr>
<td>Competitors</td>
<td>0.0</td>
<td>16.4</td>
<td>11.9</td>
<td>11.9</td>
<td>40.3</td>
</tr>
<tr>
<td>Economic conditions</td>
<td>0.0</td>
<td>7.5</td>
<td>11.9</td>
<td>26.9</td>
<td>37.3</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>0.0</td>
<td>10.5</td>
<td>14.9</td>
<td>20.9</td>
<td>34.3</td>
</tr>
<tr>
<td>Suppliers</td>
<td>0.0</td>
<td>7.5</td>
<td>11.9</td>
<td>28.4</td>
<td>38.8</td>
</tr>
<tr>
<td>Politics</td>
<td>7.5</td>
<td>2.9</td>
<td>13.4</td>
<td>16.4</td>
<td>47.8</td>
</tr>
<tr>
<td>Labour market</td>
<td>17.9</td>
<td>4.5</td>
<td>10.5</td>
<td>14.9</td>
<td>46.3</td>
</tr>
<tr>
<td>Socio-culture</td>
<td>25.4</td>
<td>2.9</td>
<td>11.9</td>
<td>22.4</td>
<td>29.9</td>
</tr>
<tr>
<td>Ecology</td>
<td>0.0</td>
<td>11.9</td>
<td>17.9</td>
<td>31.3</td>
<td>32.8</td>
</tr>
<tr>
<td>Leadership</td>
<td>9.1</td>
<td>9.1</td>
<td>25.7</td>
<td>25.8</td>
<td>18.2</td>
</tr>
</tbody>
</table>

5.3.5 Importance of factors in the micro environment

Table 5.7 indicates the importance of the micro environment factors in terms of percentage responses on a scale of 1 (not important) to 5 (very important), and a MS ranging between 1.00 and 5.00. It is notable that all the factors MSs are above the midpoint score of 3.00, which indicates that in general the respondents can be deemed
to perceive the factors to be important. However, three of the factors have MSs > 3.40 ≤ 4.20, which indicates that the respondents can be deemed to perceive the factors to be between important to more than important / more than important. Furthermore, the bottom ranked factor, corporate culture has a MS > 2.60 ≤ 3.40, which indicates that the respondents can be deemed to perceive the factor to be between less than important to important / important.

The relatively high MSs achieved may be attributed to the nature of MNOCs, some of which have been in existence for over a century. As established entities there is a tendency for them to have an effective strategic intent in place and the ability to put organisational resources to best use. The most important characteristics of successful organisations are their clarity of purpose, adherence to their core values, their distinct identity and their vision for the organisation. The implications of this is corporate inflexibility and their propensity for the culture of the organisation to strongly resist change as employees become too familiar with the traditional ways of doing things. In addition, the corporate culture is the least significant. This may be due to a lack of synergy between the corporate culture and organisational values. Moreover, strong leadership is required to align a corporate culture with an organisation's strategy.

Table 5.7: Importance of the micro environment factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Unsure</th>
<th>Not important.....Very important</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Mission and objectives</td>
<td>0.0</td>
<td>4.5</td>
<td>7.5</td>
<td>31.3</td>
</tr>
<tr>
<td>Organisation and its management</td>
<td>8.9</td>
<td>2.9</td>
<td>2.9</td>
<td>35.8</td>
</tr>
<tr>
<td>Resources of the organisation</td>
<td>0.0</td>
<td>16.4</td>
<td>7.5</td>
<td>28.4</td>
</tr>
<tr>
<td>Corporate culture</td>
<td>0.0</td>
<td>7.5</td>
<td>19.4</td>
<td>37.3</td>
</tr>
</tbody>
</table>

5.3.6 Importance of factors in the macro environment

Table 5.8 indicates the importance of the macro environment factors which are being appropriately considered as an important part of the business environment analysis in
terms of percentage responses on a scale of 1 (not important) to 5 (very important), and a MS ranging between 1.00 and 5.00. It is notable that all the MSs are above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive the factors to be important. However, given that the first five (83%) ranked factors have MSs > 3.40 ≤ 4.20, the respondents can be deemed to perceive the factors to be between important to more than important / more than important. Furthermore, the sixth ranked factor has a MS > 2.60 ≤ 3.40, which indicates that the respondents can be deemed to perceive the factors to be between less than important to important / important.

The relatively high MSs achieved suggest that organisations gather information in terms of macro factors, to make strategic business decisions. However, the high MS relative to economic factor suggest that organisations are focussed on the bottom line. The probable reason for this may be due to the fact that since independence, every government in Nigeria whether democratic or military, have always protected the interest of MNOCs who have over the years gained influence within the corridors of power and have been able to influence economic policies to favour industry operations. Respondent’s perception of the political factor as the least significant underscores, this argument.

Table 5.8: Importance of the macro environment factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Unsure</th>
<th>Not important….Very important</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Economic</td>
<td>0.0</td>
<td>11.9</td>
<td>4.5</td>
<td>8.9</td>
</tr>
<tr>
<td>Technological</td>
<td>0.0</td>
<td>4.5</td>
<td>4.5</td>
<td>35.8</td>
</tr>
<tr>
<td>International</td>
<td>0.0</td>
<td>2.9</td>
<td>7.5</td>
<td>32.8</td>
</tr>
<tr>
<td>Social</td>
<td>0.0</td>
<td>4.5</td>
<td>13.4</td>
<td>20.9</td>
</tr>
<tr>
<td>Ecological</td>
<td>0.0</td>
<td>2.9</td>
<td>11.9</td>
<td>34.3</td>
</tr>
<tr>
<td>Political</td>
<td>7.5</td>
<td>8.9</td>
<td>11.9</td>
<td>22.4</td>
</tr>
</tbody>
</table>

5.3.7 Importance of the business factors

Table 5.9 indicates the importance of the business factors in terms of percentage responses on a scale of 1 (not important) to 5 (very important), and a MS ranging between 1.00 and 5.00. It is notable that all the MSs are above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive the factors as important. However, the first to sixth ranked (67%) factors have MSs >
3.40 ≤ 4.20, which indicates that the respondents can be deemed to perceive the factors to be between important to more than important / more than important. Furthermore, the bottom three ranked factors which include: socio-cultural, politics, and ecology have MSs > 2.60 ≤ 3.40, which indicates that the respondents can be deemed to perceive the factors to be between less than important to important / important.

The relatively high MSs achieved suggest that organisations place importance on strategies to improve business results and better long range planning. The MS relative to technology further indicates that organisations favour the utilisation of technology, as reflected in table 5.6, above. In addition, the MSs relative to H&S and ecology suggest that investment on resources in H&S and ecology must be improved. It is notable that the MS relative to suppliers is above average. The reason for this could be due to the fact that oil and gas supplier market is characterised by low to moderate competition. This gives buyers fewer options.

Table 5.9: Importance of the business factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Unsure</th>
<th>Not important</th>
<th>Very important</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>0.0</td>
<td>0.0</td>
<td>4.5</td>
<td>20.9</td>
<td>32.8</td>
</tr>
<tr>
<td>Health and safety</td>
<td>0.0</td>
<td>0.0</td>
<td>11.9</td>
<td>14.9</td>
<td>37.3</td>
</tr>
<tr>
<td>Economic conditions</td>
<td>0.0</td>
<td>0.0</td>
<td>4.5</td>
<td>25.4</td>
<td>46.3</td>
</tr>
<tr>
<td>Suppliers</td>
<td>0.0</td>
<td>2.9</td>
<td>4.5</td>
<td>31.3</td>
<td>52.2</td>
</tr>
<tr>
<td>Labour market</td>
<td>0.0</td>
<td>2.9</td>
<td>16.4</td>
<td>32.8</td>
<td>28.4</td>
</tr>
<tr>
<td>Leadership</td>
<td>14.9</td>
<td>4.5</td>
<td>4.5</td>
<td>29.9</td>
<td>34.3</td>
</tr>
<tr>
<td>Socio-culture</td>
<td>0.0</td>
<td>4.5</td>
<td>13.4</td>
<td>35.8</td>
<td>43.3</td>
</tr>
<tr>
<td>Politics</td>
<td>8.9</td>
<td>8.9</td>
<td>7.5</td>
<td>22.4</td>
<td>46.3</td>
</tr>
<tr>
<td>Ecology</td>
<td>0.0</td>
<td>10.5</td>
<td>11.9</td>
<td>44.8</td>
<td>25.4</td>
</tr>
</tbody>
</table>

5.3.8 The labour market factors organisations evaluate

Table 5.10 indicates the extent to which management evaluates labour market factors in terms of percentage responses on a scale of 1 (never) to 5 (always), and a MS
ranging between 1.00 and 5.00. It is notable that four of the seven factors have MSs above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive the labour market factors to have been evaluated. However, the top two ranked factors have MSs > 3.40 ≤ 4.20, which indicates that the respondents can be deemed to perceive the factors to be evaluated between sometimes to most of the time / most of the time. Furthermore, the third to seventh ranked factors have MSs > 2.60 ≤ 3.40, which indicates that the respondents can be deemed to perceive the factors to be evaluated between rarely to sometimes / sometimes.

The cumulative average MSs achieved suggest that there may be a general lack of adequate technology-driven system deployed for assessing labour market factors. This implies that organisations may not be able to harness available human resource competence. The generally average MSs achieved relative to unemployment, HIV and AIDS and continuous downsizing suggest that there is a major scope for improvement in the human resource capital as it relates to employee welfare.

Table 5.10: Labour market factors organisations evaluate

<table>
<thead>
<tr>
<th>Factor</th>
<th>Unsure</th>
<th>Never..........................</th>
<th>Always</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Unions</td>
<td>2.9</td>
<td>4.5</td>
<td>4.5</td>
<td>13.4</td>
<td>56.7</td>
</tr>
<tr>
<td>Management</td>
<td>0.0</td>
<td>7.5</td>
<td>4.5</td>
<td>26.9</td>
<td>53.7</td>
</tr>
<tr>
<td>Education / Training</td>
<td>0.0</td>
<td>7.5</td>
<td>10.6</td>
<td>43.3</td>
<td>35.8</td>
</tr>
<tr>
<td>Terrorism</td>
<td>16.4</td>
<td>17.9</td>
<td>13.4</td>
<td>11.9</td>
<td>28.4</td>
</tr>
<tr>
<td>Unemployment</td>
<td>20.9</td>
<td>2.9</td>
<td>29.9</td>
<td>23.9</td>
<td>17.9</td>
</tr>
<tr>
<td>HIV and AIDS</td>
<td>20.9</td>
<td>11.9</td>
<td>23.9</td>
<td>16.4</td>
<td>19.4</td>
</tr>
<tr>
<td>Continuous downsizing</td>
<td>0.0</td>
<td>17.9</td>
<td>17.9</td>
<td>28.4</td>
<td>26.9</td>
</tr>
</tbody>
</table>

5.3.9 Importance of the market environment factors to the business environment analysis

Table 5.11 indicates the importance of the market environment factors to the business environment analysis in terms of percentage responses on a scale of 1 (not important) to 5 (very important), and a MS ranging between 1.00 and 5.00. It is notable that all
the MSs are above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive the factors to be important. However, the first four ranked (67%) factors have MSs > 3.40 ≤ 4.20, which indicates that the respondents can be deemed to perceive the factors to be between important to more than important / more than important. Furthermore, the bottom three ranked market environment factors which include: socio-cultural; politics; and ecology have MSs > 2.60 ≤ 3.40, which indicates that the respondents can be deemed to perceive the factors to be between less than important to important / important.

The above average MSs achieved suggest that there may be a lack of technology-driven system in place to monitor and assess the market environment factors. This implies that organisations may not be attentive to threats and opportunities from industry stakeholders. The reason for this may be due to high market demand and the low state of competition within the Nigerian oil and gas industry which is dominated by only five MNOCs.

**Table 5.11: Importance of market environment factors**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Unsure</th>
<th>Not important…Very important</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Opportunities and threats</td>
<td>0.0</td>
<td>16.1</td>
<td>8.1</td>
<td>9.7</td>
</tr>
<tr>
<td>Suppliers</td>
<td>0.0</td>
<td>8.1</td>
<td>11.3</td>
<td>24.1</td>
</tr>
<tr>
<td>Competitors</td>
<td>8.1</td>
<td>8.1</td>
<td>8.1</td>
<td>27.4</td>
</tr>
<tr>
<td>Purchasing power</td>
<td>0.0</td>
<td>22.6</td>
<td>16.1</td>
<td>17.7</td>
</tr>
<tr>
<td>Consumers</td>
<td>20.9</td>
<td>9.7</td>
<td>8.1</td>
<td>22.6</td>
</tr>
<tr>
<td>Intermediaries</td>
<td>0.0</td>
<td>14.5</td>
<td>16.1</td>
<td>45.1</td>
</tr>
</tbody>
</table>

**5.3.10 Frequency at which organisations assess three business environment levels**

Table 5.12 indicates the frequency at which organisations assess three business environment levels in terms of percentage responses on a scale of 1 (never) to 5 (all of the time), and a MS ranging between 1.00 and 5.00. It is notable that the MSs are all above the midpoint of 3.00, which indicates that in general the respondents can be deemed to perceive that all the business environment levels are assessed by management. It is notable that none of the levels have MSs > 4.20 ≤ 5.00; however,
all three MSs are $> 3.40 \leq 4.20$, which indicates that the levels are deemed to be assessed between sometimes to often / often.

Although the MSs are relatively high, nonetheless, there is scope for improvement in this area. In addition, the international level is the most significant, implying that organisations are focussed on the global business environment. The probable reason for this may be attributed to the fact that the business of oil and gas is conducted in the world market, irrespective of where it is sourced. While the MS relative to the regional level is above average, it nevertheless indicates that MNOCs need to improve their rate of assessment of the region.

Table 5.12: Frequency at which organisations assess three business environment levels

<table>
<thead>
<tr>
<th>Level</th>
<th>Unsure</th>
<th>Never</th>
<th>All of the time</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>International</td>
<td>0.0</td>
<td>1.7</td>
<td>5.1</td>
<td>16.9</td>
<td>50.9</td>
</tr>
<tr>
<td>National</td>
<td>0.0</td>
<td>5.1</td>
<td>5.1</td>
<td>18.6</td>
<td>50.9</td>
</tr>
<tr>
<td>Regional</td>
<td>0.0</td>
<td>6.8</td>
<td>10.2</td>
<td>23.7</td>
<td>45.8</td>
</tr>
</tbody>
</table>

5.3.11 Impact of five competitive forces on HS&E strategy

Table 5.13 indicates the impact of analysing five competitive forces as a basis for formulating an HS&E strategy in terms of percentage responses on a scale of 1 (very unlikely) to 5 (for sure), and a MS ranging between 1.00 and 5.00. It is notable that all the forces have MSs above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive that analysis of the competitive forces by HS&E managers will ensure the formulation of an effective HS&E strategy. However, only the top ranked force, namely industry competitors has a MS $> 3.40 \leq 4.20$, which indicates that the respondents can be deemed to perceive the impact of an analysis of the force to be between hardly to possibly / possibly. Furthermore, the second to fifth ranked forces have MSs $> 2.60 \leq 3.40$, which indicates that the respondents can be deemed to perceive the impact of an analysis of the forces to be between unlikely to hardly / hardly.
The relatively high MSs achieved suggest that to some extent HS&E strategy can be influenced by competitive forces. This implies that stakeholder corporation can drive improvement on effective HS&E strategy in the oil and gas industry in Nigeria.

**Table 5.13: Impact of five competitive forces on HS&E strategy**

<table>
<thead>
<tr>
<th>Competitive force</th>
<th>Response (%)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unsure</td>
<td>Very unlikely</td>
<td>Unlikely</td>
<td>Hardly</td>
<td>Possibly</td>
<td>For sure</td>
<td>MS</td>
<td>Rank</td>
</tr>
<tr>
<td>Industry competitors</td>
<td>0.0</td>
<td>0.0</td>
<td>18.9</td>
<td>20.7</td>
<td>44.8</td>
<td>15.5</td>
<td>3.76</td>
<td>1</td>
</tr>
<tr>
<td>Suppliers</td>
<td>0.0</td>
<td>31.0</td>
<td>5.2</td>
<td>29.3</td>
<td>25.9</td>
<td>8.6</td>
<td>3.38</td>
<td>2</td>
</tr>
<tr>
<td>Buyers</td>
<td>0.0</td>
<td>0.0</td>
<td>36.2</td>
<td>32.8</td>
<td>27.6</td>
<td>3.5</td>
<td>3.34</td>
<td>3</td>
</tr>
<tr>
<td>Potential entrants</td>
<td>0.0</td>
<td>36.2</td>
<td>3.5</td>
<td>32.8</td>
<td>17.2</td>
<td>10.3</td>
<td>3.34</td>
<td>4</td>
</tr>
<tr>
<td>Substitutes</td>
<td>0.0</td>
<td>0.0</td>
<td>31.0</td>
<td>6.9</td>
<td>32.8</td>
<td>29.3</td>
<td>3.22</td>
<td>5</td>
</tr>
</tbody>
</table>

5.4 **Leadership and Management Practices**

5.4.1 **Importance of five parameters relative to two aspects of management**

Table 5.14 indicates the importance of four parameters relative to two aspects of management, namely project and strategic management in terms of percentage responses on a scale of 1 (not important) to 5 (very important), and a MS ranging between 1.00 and 5.00. It is notable that all the MSs are above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive the parameters as important to both project and strategic management. It is notable that none of the parameters have MSs > 4.20 ≤ 5.00; however, all the parameters have MSs > 3.40 ≤ 4.20, which indicates that the respondents can be deemed to perceive the parameters to be between important to more than important / more than important.

The relatively high MSs achieved suggest that cost is the most important parameter relative to the two aspects of management. The reason for this is the importance place on return on investment by MNOCs. For the project management section, the findings supports the argument that there is a paradigm shift from the traditional methods applied in project management which were based on parameters such as cost, time and quality to include H&S. For the strategic management section, the MS relative to
the environment suggest that at strategic level MNOCs consider the environment as important. The MSs relative to quality in the project management section, suggest the need for improvement in that aspect.

Table 5.14: Importance of four parameters relative to two aspects of management

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unsure</th>
<th>Not important…Very important</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Project management:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td>0.0</td>
<td>3.0</td>
<td>4.6</td>
<td>12.1</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>0.0</td>
<td>0.0</td>
<td>7.6</td>
<td>22.7</td>
</tr>
<tr>
<td>Schedule</td>
<td>0.0</td>
<td>0.0</td>
<td>7.6</td>
<td>33.3</td>
</tr>
<tr>
<td>Quality</td>
<td>0.0</td>
<td>4.5</td>
<td>14.9</td>
<td>26.9</td>
</tr>
<tr>
<td><strong>Strategy management:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td>0.0</td>
<td>0.0</td>
<td>4.6</td>
<td>13.6</td>
</tr>
<tr>
<td>Environment</td>
<td>0.0</td>
<td>0.0</td>
<td>9.1</td>
<td>21.2</td>
</tr>
<tr>
<td>Quality</td>
<td>0.0</td>
<td>4.6</td>
<td>3.0</td>
<td>19.7</td>
</tr>
<tr>
<td>Schedule</td>
<td>0.0</td>
<td>0.0</td>
<td>7.6</td>
<td>34.9</td>
</tr>
</tbody>
</table>

5.4.2 Impact of management relative to certain aspects

Table 5.15 indicates the impact of management approaches in terms of percentage responses on a scale of 1 (strongly disagree) to 5 (strongly agree), and a MS ranging between 1.00 and 5.00. It is notable that all the MSs are above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to agree with the extent of impact of management approaches. It is notable that the first ranked approach has a MS > 4.20 ≤ 5.00, which indicates that the respondents can be deemed to perceive the approach to be between agree to strongly agree / strongly agree. However, given that the second and third ranked approaches have MSs > 3.40 ≤ 4.20, therefore, the respondents can be deemed to perceive the approaches to be between neutral to agree / agree.

The relatively high MSs achieved suggest that in terms of the corporate environment, management role is significant in driving organisational strategies. This underscores the fact that management is one of the determinants of the success of any business organisation. The findings also suggest the need to ensure management participation
at all levels in the business environment assessment process. The probable reason for this may be because the managers will be responsible for regulating, planning, coordinating, directing and organising the revised strategies accordingly.

Table 5.15: Impact of management approaches relative to certain aspects

<table>
<thead>
<tr>
<th>Approach</th>
<th>Unsure</th>
<th>Strongly disagree</th>
<th>Strongly agree</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management plays an important role in your organisation</td>
<td>0.0</td>
<td>0.0</td>
<td>4.5</td>
<td>5.0</td>
<td>4.48</td>
</tr>
<tr>
<td>All levels of management are involved in the business environment analysis process</td>
<td>0.0</td>
<td>10.5</td>
<td>16.4</td>
<td>35.8</td>
<td>22.4</td>
</tr>
<tr>
<td>Management is operating at their full potential within your organisation</td>
<td>12.7</td>
<td>4.8</td>
<td>15.9</td>
<td>25.4</td>
<td>14.3</td>
</tr>
</tbody>
</table>

5.4.3 Importance of approaches relative to leadership

Table 5.16 indicates the importance of leadership approaches in terms of percentage responses on a scale of 1 (not important) to 5 (very important), and a MS ranging between 1.00 and 5.00. It is notable that all the MSs are above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive the approaches as important. However, all three approaches have MSs > 3.40 ≤ 4.20, which indicates that the respondents can be deemed to perceive the approaches to be between important to more than important / more than important.

The above average MSs achieved underscores the raising concerns about the desirability of stronger political leadership particularly in developing countries and the efficacy of institutional reform in influencing the way that organisations operate seeing that this can have a positive impact on their performance.
Table 5.16: Importance of three leadership approaches

<table>
<thead>
<tr>
<th>Approaches</th>
<th>Unsure</th>
<th>Not important…Very important</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact of poor leadership within the government</td>
<td>0.0</td>
<td>11.1 9.5 14.3 44.4 20.6</td>
<td>3.76</td>
<td>1</td>
</tr>
<tr>
<td>Effectiveness of leadership in your organisation</td>
<td>4.8</td>
<td>4.8 4.8 36.5 26.9 22.2</td>
<td>3.57</td>
<td>2</td>
</tr>
<tr>
<td>Leadership styles in your organisation</td>
<td>0.0</td>
<td>11.1 7.9 39.7 26.9 14.3</td>
<td>3.48</td>
<td>3</td>
</tr>
</tbody>
</table>

5.4.4 Styles of leadership prevalent in organisations

Figure 5.1 indicates the type of leadership styles prevalent in the organisations according to the three levels of management. It is notable that 38% of the respondents perceive that the autocratic style leadership is prevalent, 16% indicate that the situational leaders-style is prevalent, 11% of the respondent suggest that the authoritarian style of leadership is prevalent and another 11% indicate that the entrepreneurial style of leadership is prevalent. However, 10% of the respondents indicate that participative leadership is prevalent, while the democratic leadership style is perceived as prevalent by 10% of the respondents. Furthermore, 8%, of the respondents perceived that the executive style of leadership is prevalent while only 3% suggest that the laissez-fair style of leadership is prevalent.

The analysis suggests that the most prevalent leadership style in MNOCs is the autocratic leadership style. This implies that the traditional leadership approach is most prevalent in MNOCs in Nigeria. Furthermore, the findings suggest that multiple styles of leadership styles are used by managers to manage teams and groups. This underscores the argument that leaders must adjust their leadership style to the situation as well as to the people being led. This implies that the inability of management to execute collaborated effort depends on leadership capability.
5.4.5 Use of different project leadership styles throughout project delivery process

Figure 5.2 indicates the use of different leadership styles at the various phases of the project delivery process. It is notable that 57% of the respondents indicate that they employ different leadership styles, as opposed to 43% who suggest that they maintain one leadership style throughout the project’s life-cycle.

From the analysis it can be inferred that managers adopt a flexible leadership style in the project management process. This implies that leadership styles used by managers will vary depending upon teams and what the team response best to.
Figure 5.2: Use of different leadership styles throughout project life-cycle

5.4.6 Existence of the use of the operational training policy and procedure

Figure 5.3 indicates the response given by respondents when requested to indicate if the organisation has an operational training policy and procedure. It is notable that 52% of the respondents indicate that the organisation has an operational training policy and procedure. However, 48% of the respondents indicate that the organisation does not have an operational training policy and procedure.

The findings suggest a gap in organisational-driven intervention-oriented approach to effecting organisational development via improvement of human resources competence with a view to increasing effectiveness. This will impact on worker productivity relative to achieving organisational objectives. The probable reason could be based on perceptions in certain quarters, where training is viewed as an expense rather than an investment.
5.4.7 Importance of employee training / skills and intellectual capital

Table 5.17 indicates the importance of the aspects of employee training and education in terms of percentage responses on a scale of 1 (not important) to 5 (very important), and a MS ranging between 1.00 and 5.00. It is notable that all the MSs are above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive employee training and education as important. However, the top two aspects, namely multi-skilling employees and intellectual property have MSs > 3.40 ≤ 4.20, which indicates that the respondents can be deemed to perceive those aspects of training and education to be between important to more than important / more than important. Furthermore, the bottom aspect has an MS > 2.60 ≤ 3.40, which indicates that the respondents can be deemed to perceive the importance of training of staff to top-management to be between less than important to important / important.

The above average MSs achieved suggest that there is major scope for improving the human resources management competencies with respect to training and education of workers. Training of workers is a particularly weak area based on the perceptions of the survey respondents. However, training is one of the foremost methods used in maintaining and improving intellectual capital. It is also a vital tool which can be used in developing workers skills.
Table 5.17: Importance of employee training / skills and intellectual property

<table>
<thead>
<tr>
<th>Training / education</th>
<th>Unsure</th>
<th>Not important...Very important</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Importance of multi-skilling employees</td>
<td>0.0</td>
<td>5.0</td>
<td>16.7</td>
<td>28.3</td>
</tr>
<tr>
<td>Importance of intellectual capital</td>
<td>0.0</td>
<td>3.3</td>
<td>15.0</td>
<td>33.3</td>
</tr>
<tr>
<td>Importance of training of staff to top management</td>
<td>0.0</td>
<td>11.7</td>
<td>20.0</td>
<td>33.3</td>
</tr>
</tbody>
</table>

5.5. HS&E Practices

5.5.1 Importance of planning for HIV and AIDS

Figure 5.4 indicates the importance organisations place on planning for HIV and AIDS, and it is notable that 51% of the respondents perceive that their organisation plans for HIV and AIDS, 18% indicate that their organisation does not plan for HIV and AIDS and 31% are unsure.

It can be deduced from the analysis that there is a low rate of planning for HIV and AIDS by MNOCs in Nigeria. The implications will include inadequate workplace policies which could ensure rights such as access to health care and counselling. Also, management can hinder their ability to collect relevant information about the needs and constraints faced by workers and host communities in coping with the epidemic and the manner in which they envisage these needs and constraints should be addressed.
5.5.2 HIV and AIDS strategy

Figure 5.5 indicates the existence of a written HIV and AIDS strategy to assist employees. It is notable that 51% of the respondents indicate that their organisation has a written HIV and AIDS strategy in place to assist workers. Some 29% indicate that the organisation does not have a strategic HIV and AIDS policy and 20% are unsure of the existence of a written HIV and AIDS policy being in place.

The analysis suggests a need for improvement in the extent of awareness in the workplace of a HIV and AIDS strategy. This underscores the importance of awareness and prevention. The implication of this is lower awareness of HIV and AIDS education and prevention amongst workers which could be felt in greater absenteeism; faster staffs turn over due to early deaths and reduced productivity.
5.5.3 Existence of a written HS&E Policy

Respondents were requested to indicate if their organisation has a written HS&E policy according to the three levels of management. It is notable that all the respondents (100%) indicate that their organisation has a written HS&E policy in place. The findings suggest management commitment to improving HS&E performance in the workplace. Since awareness is a precondition for the development of an optimum HS&E culture.

5.5.4 Frequency of adherence to the HS&E policy

Table 5.18 indicates the frequency of adherence to HS&E policy in terms of percentage responses on a scale of 1 (never) to 5 (always), and a MS ranging between 1.00 and 5.00. It is notable that the question has an MS ≤ 3.00, which indicates that relative to these aspects the Nigerian oil and gas industry can be deemed to be rated below average.

The above average MS achieved suggest a major scope for improvement in the planning and communication process. This could result in high rate of death, injury, absenteeism which could all culminate in reduced productivity and increasing cost to organisation.
Table 5.18: Frequency of adherence to the HS&E policy

<table>
<thead>
<tr>
<th>Unsure</th>
<th>Never</th>
<th>Always</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>0.0</td>
<td>8.9</td>
<td>32.8</td>
<td>17.9</td>
<td>8.9</td>
</tr>
</tbody>
</table>

5.5.5 Frequency of compliance with the national environmental guidelines

Table 5.19 indicates the extent of compliance with national environmental guidelines and standards in terms of percentage responses on a scale of 1 (never) to 5 (always), and a MS ranging between 1.00 and 5.00. It is notable that both statements have MSs above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive that the organisations always comply with environmental guidelines and standards. However, both statements have MSs $> 3.40 \leq 4.20$, which indicates that the respondents can be deemed to perceive the frequency of compliance to be between sometimes to most of the time / most of the time.

Although, the above average MSs achieved suggest that there is a major scope for improvement in this area. However, it also infers that there is an implementation gap between deterrence, compliance and enforcement. The probable reason for this may be because historically, regulation, monitoring, and enforcement have been, and remain, critical determinants of environmental outcomes. The implication of this will be uncontrolled exploitation of environmental resources and the laissez-faire attitude of industry due to weak or non-enforcement of environmental laws.

Table 5.19: Frequency of compliance with the national environmental guidelines

<table>
<thead>
<tr>
<th>Statement</th>
<th>Unsure</th>
<th>Never</th>
<th>Always</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are the guidelines and standards for environmental protection / pollution control in Nigeria applied within your</td>
<td>0.0</td>
<td>14.9</td>
<td>5.9</td>
<td>8.9</td>
<td>34.3</td>
</tr>
</tbody>
</table>
organisation?
Has your organisation been successful with its environmental protection / pollution control programme?

<table>
<thead>
<tr>
<th></th>
<th>Unsure</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management within your organisation should consider terrorism as an element of the environmental evaluation of your organisation?</td>
<td>0.0</td>
<td>0.0</td>
<td>11.9</td>
<td>4.5</td>
<td>28.4</td>
<td>55.2</td>
<td>4.34</td>
<td>1</td>
</tr>
</tbody>
</table>

### 5.5.6 Security approaches

Table 5.20 indicates the extent to which respondents agree with aspects of management approaches relative to security in terms of percentage responses on a scale of 1 (strongly disagree) to 5 (strongly agree), and a MS ranging between 1.00 and 5.00. It is notable that all the MSs are above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to agree with the security approaches. It is notable that the top two ranked security approaches have MSs > 4.20 ≤ 5.00, and the respondents can be deemed to perceive the approaches to be between agree to strongly agree / strongly agree. However, given that the third ranked approach has an MS > 3.40 ≤ 4.20, therefore, the respondents can be deemed to perceive the approach to be between neutral to agree / agree.

The relatively high MSs achieved underscores the rising spate of insecurity that is pervading industry workers. Global security threats, attacks on energy assets and impact of violence and abduction for profits have all contributed to heightened uncertainties.

### Table 5.20: Security approaches

<table>
<thead>
<tr>
<th>Security approaches</th>
<th>Response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unsure</td>
</tr>
<tr>
<td>Management within your organisation should consider terrorism as an element of the environmental evaluation of your organisation</td>
<td>0.0</td>
</tr>
</tbody>
</table>
organisation

The impact of global issues on the security and environmental process within your organisation is being assessed and taken into account

<table>
<thead>
<tr>
<th>Level</th>
<th>Response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational</td>
<td>33.3</td>
</tr>
<tr>
<td>Middle</td>
<td>46.7</td>
</tr>
<tr>
<td>Top</td>
<td>20.0</td>
</tr>
</tbody>
</table>

The impact of social responsibility issues relative to host communities is being assessed and taken into account within your organisation

<table>
<thead>
<tr>
<th>Level</th>
<th>Response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational</td>
<td>33.3</td>
</tr>
<tr>
<td>Middle</td>
<td>46.7</td>
</tr>
<tr>
<td>Top</td>
<td>20.0</td>
</tr>
</tbody>
</table>

5.6 Analysis of Phase two questionnaire data

5.6.1 Biographical information

5.6.1.1 Title and capacity

A total of 15 managers in the MNOCs responded to the survey. Table 5.21 indicates that 33.3% of respondents are currently working at operational management level, 46.7% at middle, and 20% at top. Operational management includes Site HS&E Supervisors and officers from the department of security. Middle management includes HS&E managers and Top management includes, Heads of Department of HS&E Units. All respondents in this phase of the study are from the various HS&E departments. The level respondents are currently working at is an indication that the data obtained from them can be relied upon.

Table 5.21 Levels of HS&E management in which respondents are currently working at
5.6.1.2 Scale of respondents’ organisational operations

Table 5.22 indicates the scale of organisational operations as 100% international operations.

**Table 5.22: The scale of organisations’ operations**

<table>
<thead>
<tr>
<th>Scale of operations</th>
<th>Response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>0.0</td>
</tr>
<tr>
<td>National</td>
<td>0.0</td>
</tr>
<tr>
<td>International</td>
<td>100</td>
</tr>
</tbody>
</table>

5.6.2 Technology and innovation influences on HS&E

5.6.2.1 Existence of a department of research and development

Respondents were asked to indicate if their organisation has a department of research and development. It is notable that all the respondents (100%) suggest that their organisation has a department of research and development.

5.6.2.2 Frequency of integration of aspects of technology

For Table 5.23 respondents were requested to indicate the frequency to which aspects of technology are integrated into their organisations’ business strategy in terms of percentage responses on a scale of 1 (never) to 5 (always), and a MS ranging between 1.00 and 5.00. It is notable that all the MSs are above the midpoint of 3.00, which indicates that in general the respondents can be deemed to perceive the aspects of technology to be integrated. It is notable that four (83%) of the six aspects have MSs > 4.20 ≤ 5.00, and therefore the respondents can be deemed to perceive the frequency of integration to be between most of the time to always / always. However, given that the MSs for the bottom two ranked aspects are > 3.40 ≤ 4.20, the respondents can be deemed to perceive the frequency of integration to be between sometimes to most of the time / most of the time.
The high MSs achieved in the analysis suggest that, relative to the corporate environment, organisations tend to ensure that management buy-in is in place in order to make sure that they embrace and enhance the overall level of technology in the organisation. In relation to strategy, the analysis suggests a fusion between purposeful strategy deployments with respect to technology and corporate / project strategy. Despite the high MSs achieved in the fifth and sixth most significant aspects, the analysis suggest that there is major scope for improvement in the level of engagement between the technology manager and the HS&E / project managers as it relates to implementation of new technologies. However, the design and management of technology are the responsibility of the technology manager. It is not compulsory for the project / HS&E managers to have vast knowledge in that area. Otherwise, it may result in frictions in responsibilities.

**Table 5.23: Frequency of integration of aspects of technology**

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Unsure</th>
<th>Never</th>
<th>Always</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology is a key factor in the overall business / project strategy</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>20.0</td>
<td>73.3</td>
</tr>
<tr>
<td>Organisational procedures exist to ensure the optimal exploitation of technology</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>40.0</td>
<td>53.3</td>
</tr>
<tr>
<td>Technology and innovation strategy is part of organisational mission</td>
<td>0.0</td>
<td>0.0</td>
<td>13.3</td>
<td>33.3</td>
<td>53.3</td>
</tr>
<tr>
<td>The technology strategy is a significant contributor to the corporate and project strategy</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>40.0</td>
<td>46.7</td>
</tr>
<tr>
<td>HS&amp;E / project managers are active members of the technology culture</td>
<td>0.0</td>
<td>0.0</td>
<td>13.3</td>
<td>46.7</td>
<td>40.0</td>
</tr>
<tr>
<td>HS&amp;E / project managers work closely with the technology manager</td>
<td>0.0</td>
<td>0.0</td>
<td>13.3</td>
<td>40.0</td>
<td>33.3</td>
</tr>
</tbody>
</table>
5.7.  Best practice (BP) influence on project delivery process

5.7.1  Extent of integration of best practices into the project life-cycle

Table 5.24 indicates the extent to which six practices have been successfully integrated into the project life-cycle in terms of percentage responses on a scale of 1 (not at all) to 5 (extensively), and a MS ranging between 1.00 and 5.00. It is notable that all the MSs are above the midpoint of 3.00, which indicates that in general the respondents can be deemed to perceive the practices have been integrated. It is notable that risk management, an integral aspect of HS&E management, is ranked sixth. However, the MS of the first ranked practice is > 4.20 ≤ 5.00, and therefore the respondents can be deemed to perceive the level of integration to be between relatively extensively to extensively / extensively. Furthermore, the MSs for the second to sixth ranked practices are > 3.40 ≤ 4.20, and therefore the respondents can be deemed to perceive the level of integration to be between moderately to relatively extensively / relatively extensively.

The relatively high MSs achieved relative to project management maturity and HS&E suggest that organisations are becoming increasingly dependent on the use of projects. This supports the argument that project management should be a core capability requirement. The analysis, further indicate a shift from the traditional approach of H&S being least important among five project parameters of project quality, public H&S, time and costs. This implies that HS&E awareness positively impacts on project performance.

The MSs achieved relative to cost emphasizes its significance in the project delivery process. Since it is the measure that is most often presented and widely understood as an indicator of how well a project is performing, is likely to have performed or has performed. The result further suggest a dearth of adequate technology-driven systems deployed for forecasting future trends in information dissemination, project design and control and collaboration related technologies. Furthermore, risk management is perceived by respondents as the least significant in spite of its strategic importance to both HS&E / project management. Given the wide array of business risks facing organisations in these turbulent times, the notion of risk management is likely to be a popular subject going forward.
Table 5.24: Extent of integration of best practices into the project delivery process

<table>
<thead>
<tr>
<th>Practice</th>
<th>Response (%)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unsure</td>
<td>Not at all</td>
<td>Slightly</td>
<td>Moderately</td>
<td>Relatively extensively</td>
<td>Extensively</td>
<td>MS</td>
<td>Rank</td>
<td></td>
</tr>
<tr>
<td>Project management maturity</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>28.6</td>
<td>35.7</td>
<td>35.7</td>
<td>4.07</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Health, safety and Environment</td>
<td>0.0</td>
<td>0.0</td>
<td>21.4</td>
<td>7.1</td>
<td>35.7</td>
<td>35.7</td>
<td>4.07</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Cost effective management</td>
<td>0.0</td>
<td>7.1</td>
<td>7.1</td>
<td>21.4</td>
<td>35.7</td>
<td>28.6</td>
<td>3.86</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Concurrent engineering</td>
<td>0.0</td>
<td>0.0</td>
<td>21.4</td>
<td>14.3</td>
<td>50.0</td>
<td>14.3</td>
<td>3.79</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Technology management auditing</td>
<td>0.0</td>
<td>0.0</td>
<td>21.4</td>
<td>28.6</td>
<td>35.7</td>
<td>14.3</td>
<td>3.64</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Risk management</td>
<td>0.0</td>
<td>0.0</td>
<td>21.4</td>
<td>35.7</td>
<td>35.7</td>
<td>7.1</td>
<td>3.50</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

5.7.2 Extent to which approaches are integrated into HS&E management

Table 5.25 indicates the extent to which HS&E managers integrate the following approaches in terms of percentage responses on a scale of 1 (never) to 5 (always), and a MS ranging between 1.00 and 5.00. It is notable that the MSs are all above the midpoint of 3.00, which indicates that in general the respondents can be deemed to perceive the approaches to be integrated. It is notable that the first to fourth ranked approaches have MSs > 4.20 ≤ 5.00, which indicates that the respondents can be deemed to perceive the extent of integration of the approaches to be between most of the time to always / always. Furthermore, the MSs for the bottom two ranked approaches are > 3.40 ≤ 4.20, which indicates that the respondents can be deemed to perceive the extent of integration of the approaches to be between sometimes to most of the time.

The relatively high MSs achieved suggest that policies are developed in order to entrench systems and procedures relative to HS&E management. The analysis also suggests a display of dedication to continuous improvement and development.
However, the findings also indicate a major scope for improving global opportunities for benchmarking purposes and harnessing these opportunities as a tool to gain competitive advantage. Also, the findings suggest space for improvement in terms of adapting the new development and components of HS&E management. Finally, the findings indicate that improvement must be embarked upon in the area of employee engagement, because it can encourage creativity, complex problem solving skills and out of the box thinking project team members.

Table 5.25: Extent to which approaches are integrated into HS&E management

<table>
<thead>
<tr>
<th>Approach</th>
<th>Unsure</th>
<th>Never</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outline specific goals directed at establishing HS&amp;E standards on all</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
</tr>
<tr>
<td>projects and within the organisation</td>
<td></td>
<td></td>
<td>26.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>66.7</td>
</tr>
<tr>
<td>Effectively communicate HS&amp;E strategy and deploy it throughout all</td>
<td>0.0</td>
<td>0.0</td>
<td>13.3</td>
</tr>
<tr>
<td>levels within the organisation and on projects</td>
<td></td>
<td></td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>73.3</td>
</tr>
<tr>
<td>Ensure that the HS&amp;E / project members are highly-skilled, knowledge</td>
<td>0.0</td>
<td>0.0</td>
<td>13.3</td>
</tr>
<tr>
<td>resourced, trainers and problem solvers</td>
<td></td>
<td></td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>46.7</td>
</tr>
<tr>
<td>Perform HS&amp;E benchmarking to establish new developments and</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
</tr>
<tr>
<td>components of HS&amp;E</td>
<td></td>
<td></td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>53.3</td>
</tr>
<tr>
<td>Adapts to these new benchmarked mentioned in development and</td>
<td>0.0</td>
<td>0.0</td>
<td>13.3</td>
</tr>
<tr>
<td>components (above)</td>
<td></td>
<td></td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>60.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20.0</td>
</tr>
<tr>
<td>Allow project teams to establish their own objectives and measures to</td>
<td>0.0</td>
<td>0.0</td>
<td>20.0</td>
</tr>
<tr>
<td>support</td>
<td></td>
<td></td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>46.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>26.7</td>
</tr>
</tbody>
</table>

MS: Mean Score  
Rank: Position within the distribution of scores
5.8 Management attitude towards HS&E practice

5.8.1 Extent of management commitment to modern HS&E influences

Table 5.26 indicates the extent of management commitment to adopting modern HS&E influences on business practice in terms of percentage responses on a scale of 1 (never) to 5 (all of the time), and a MS ranging between 1.00 and 5.00. It is notable that the MSs are all above the midpoint of 3.00, which indicates that in general the respondents can be deemed to perceive management to be committed to adopting modern HS&E influences. It is notable that the first to tenth (90%) ranked aspects have MSs > 4.20 ≤ 5.00, which indicates that the respondents can be deemed to perceive the extent of commitment to be between often to all of the time / all of the time. Furthermore, given that the MS for the bottom ranked aspect is > 3.40 ≤ 4.20, this indicates that the respondents can be deemed to perceive the aspect to be between sometimes to often / often.

The relatively high MSs achieved suggest deployment of procedure based policy organisation-wide with respect to HS&E. It also infers that management buy-in is in place to make sure that they promote and embrace HS&E awareness and improve the overall level of HS&E in the workplace. Although, the MS relative to monitoring and evaluation of HS&E trends and indicators is relatively high, it suggests that there is a gap between deployments of technology at corporate level with respect to functional HS&E planning. This disconnection marginalises technology’s role in value creation.

Table 5.26: Extent of management commitment to modern HS&E influences

<table>
<thead>
<tr>
<th>Management commitment</th>
<th>Unsure</th>
<th>Never...............All of the time</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management recognises the implications of HS&amp;E</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>13.3</td>
</tr>
<tr>
<td>Management has a good understanding of the principles of</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>20.0</td>
</tr>
<tr>
<td>HS&amp;E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HS&amp;E management is recognised as significant at all levels of management</td>
<td>0.0 0.0 0.0 6.7 20.0 73.3 4.60 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower and middle level line managers willingly release their employees for HS&amp;E training</td>
<td>0.0 0.0 0.0 6.7 26.7 66.7 4.60 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Executives visibly support HS&amp;E through presentations, correspondence and by attending HS&amp;E team meetings / briefings</td>
<td>0.0 0.0 0.0 6.7 33.3 60.0 4.53 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management recognises what must be done in order to achieve maturity in HS&amp;E</td>
<td>0.0 0.0 0.0 13.3 26.7 60.0 4.47 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower and middle level managers are totally and visibly supportive of HS&amp;E</td>
<td>0.0 0.0 0.0 6.7 40.0 53.3 4.47 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management at all levels recognises the benefits that are possible from implementing sound HS&amp;E management practices</td>
<td>0.0 0.0 6.7 6.7 20.0 66.7 4.47 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All the lower and middle-level line managers have been trained and educated in HS&amp;E</td>
<td>0.0 0.0 0.0 20.0 20.0 60.0 4.40 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Executives demonstrate a willingness to change the way of doing business in order to achieve excellence in HS&amp;E</td>
<td>0.0 0.0 6.7 13.3 20.0 60.0 4.40 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One or more HS&amp;E software packages are used for tracking HS&amp;E trends and indicators by</td>
<td>0.0 0.0 6.7 6.7 46.7 40.0 4.20 11</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.9 HS&E influences on existing project management practices

5.9.1 Action and occurrences relative to HS&E management

Table 5.27 indicates the extent to which management actions and occurrences relative to HS&E influences are integrated into the project management practices in terms of percentage responses on a scale of 1 (never) to 5 (all of the time), and a MS ranging between 1.00 and 5.00. It is notable that the MSs are all above the midpoint of 3.00, which indicates that in general the respondents can be deemed to perceive that the actions and occurrences have been integrated into the project management practices. However, given that the MSs for all six actions and occurrences are $> 4.20 \leq 5.00$, the respondents can be deemed to perceive the extent of integration to be between often to all of the time / all of the time.

The relatively high MSs achieved suggest deployment of a procedure based HS&E policy with respect to projects. This may be attributed to the nature of MNOCs as corporate entities with rigorous corporate procedures for HS&E, project and people management. These are often paper-based procedures. The implication is that when thousands of people and equipment interact there is a critical gap in the assurance loop. In addition, improvement must be embarked upon in the area of HS&E training for project managers and project team members. Failure to adequately train and educate employees may lead to erosion of existing competitive advantages an organisation may possess.

Table 5.27: Action / occurrences relative to HS&E influences

<table>
<thead>
<tr>
<th>Action / occurrences</th>
<th>Unsure</th>
<th>Never.............</th>
<th>All of the time</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>HS&amp;E policies are implemented on projects</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>26.7</td>
<td>73.3</td>
</tr>
<tr>
<td>Line managers are committed to HS&amp;E and to promises made</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>80.0</td>
</tr>
<tr>
<td>to HS&amp;E / project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Managers for deliverables

Organisational specific HS&E management process and procedure are established based on the best processes and practices

|                          | 0.0 | 0.0 | 0.0 | 0.0 | 33.3 | 66.7 | 4.67 | 3 |

HS&E managers share accountability with project managers

|                          | 0.0 | 0.0 | 6.7 | 6.7 | 20.0 | 66.7 | 4.53 | 4 |

Strategic HS&E is successfully integrated for managing projects

|                          | 0.0 | 0.0 | 0.0 | 6.7 | 33.3 | 60.0 | 4.53 | 5 |

Project managers / project team members undergo training in HS&E to enhance their skills

|                          | 0.0 | 0.0 | 0.0 | 6.6 | 53.3 | 40.0 | 4.33 | 6 |

5.10 HS&E TRAINING AND EDUCATION

5.10.1 Training of workers

Figure 5.6 indicates the existence of a written HS&E operational training policy and procedure in their organisations. It is notable that 93% of the respondents indicate that their organisation has an operational training policy and procedure in place. However, 7% of the respondents are unsure of the existence of an operational training policy and procedure.

The findings are contrary to response (100%) in Section 5.5.3 above, where the three levels of management in the Phase one questionnaire indicated that they are aware that the organisation has a written operational training policy and procedure in place. The probable reason for this could be due to the policy used for contract workers who are not entitled to the organisations benefit. Although, the percentage is relatively low, failure to train and educate employees may lead to erosion of an organisation existing competitive advantage.
Figure 5.6: Existence of a HS&E training policy and procedure

![Pie chart showing 93% Yes and 7% Unsure]

5.10.2 Types of training courses

Table 5.28 indicates the frequency at which three different types of training courses have been conducted in terms of percentage responses on a scale of 1 (never) to 5 (always), and a MS ranging between 1.00 and 5.00. It is notable that all the courses have MSs above the midpoint score of 3.00, which indicates that in general the courses can be deemed to have been conducted. It is notable that the MS of the first ranked course is $> 4.20 \leq 5.00$, and therefore the respondents can be deemed to perceive that the HS&E management course has been conducted between often to always / always. Furthermore, given that the MSs for the second and third ranked courses are $> 3.40 \leq 4.20$, the respondents can be deemed to perceive the related training to have been conducted between sometimes to often / often.

The relatively high MSs achieved suggest deployment of knowledge development with respect to the various aspects. However, the findings infer scope for improvement, particularly in relation to good public relation practices with respect to host communities.
Table 5.28: Types of training courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Unsure</th>
<th>Never………………Always</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Health and safety</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>60.0</td>
</tr>
<tr>
<td>Good business practices</td>
<td>0.0</td>
<td>0.0</td>
<td>26.7</td>
<td>53.3</td>
</tr>
<tr>
<td>Good public relation practices in dealing</td>
<td>0.0</td>
<td>0.0</td>
<td>13.3</td>
<td>20.0</td>
</tr>
<tr>
<td>with communities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.10.3 Frequency of HS&E training courses

Figure 5.7 indicates the frequency of internal HS&E related training courses conducted annually. It is notable that 40% of the respondents indicate that the number of internal HS&E related training courses conducted is > 30, 33% indicate that the number of training courses is > 11 ≤ 20, and 27% indicate that the number of HS&E courses conducted is > 6 ≤ 10.

The findings suggest that there is major scope for improving the human resources management competency with respect to HS&E management. This will improve competitiveness and ensure work skills stay current while maintaining a highly skilled and motivated workforce. Also, a culture of HS&E awareness stems from HS&E education and training.

Figure 5.7: Frequency of internal HS&E training
5.10.4 Formal qualification of HS&E managers

Table 5.29 indicates reasons for which employees are promoted to HS&E manager in terms of percentage responses on a scale of 1 (never) to 5 (always), and a MS ranging between 1.00 and 5.00. It is notable that all the reasons have MSs above the midpoint score of 3.00, which indicates that in general respondents can be deemed to perceive the reasons as applied in promoting HS&E managers. It is notable that the MS for the first ranked reason is > 4.20 ≤ 5.00, and the respondents can be deemed to perceive the promotion of employees to HS&E managers for this reason to be between often to always / always. However, the MSs for the second to the fourth ranked reasons are > 3.40 ≤ 4.20, and therefore the respondents can be deemed to perceive the promotion of employees to HS&E managers for these reasons to be between sometimes to often / often. Furthermore, given that the MS of the fifth ranked is > 2.60 ≤ 3.40, the respondents can be deemed to perceive the promotion of employees to HS&E managers for their ability to make sound business decisions is between rarely to sometimes / sometimes.

The relatively high MSs achieved suggest that the purpose for appointments of workers to the position of HS&E managers is flawed. The findings infer that technical competence is not a key criterion in the appointing of HS&E managers. If HS&E managers do not have the appropriate training and technical skills they cannot perform their work tasks efficiently or at optimal level.

Table 5.29: Bases for which employees are promoted to HS&E managers

<table>
<thead>
<tr>
<th>Reason</th>
<th>Unsure</th>
<th>Never</th>
<th>Always</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>The organisation has nowhere else to put them</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>26.7</td>
<td>60.0</td>
</tr>
<tr>
<td>Possess sound administrative skills as professional managers</td>
<td>0.0</td>
<td>0.0</td>
<td>13.0</td>
<td>6.7</td>
<td>33.3</td>
</tr>
<tr>
<td>Possess technical expertise</td>
<td>0.0</td>
<td>6.7</td>
<td>26.7</td>
<td>13.3</td>
<td>13.3</td>
</tr>
<tr>
<td>Well remunerated</td>
<td>13.3</td>
<td>6.7</td>
<td>20.0</td>
<td>6.7</td>
<td>26.7</td>
</tr>
<tr>
<td>Ability to make sound business</td>
<td>13.3</td>
<td>13.3</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
</tr>
</tbody>
</table>
decisions

5.11 Importance of project parameters relative to HS&E

Table 5.30 indicates the importance of six parameters to organisations in terms of percentage responses on a scale of 1 (not important) to 5 (very important), and a MS ranging between 1.00 and 5.00. It is notable that all the parameters have MSs above the midpoint score of 3.00, which indicates that in general they can be deemed to perceive the parameters to be important. However, given that the MSs for the top four (67%) parameters are $> 4.20 \leq 5.00$, the respondents can be deemed to perceive the parameters to be between more than important to very important / very important. Furthermore, the MSs for the bottom two parameters are $> 3.40 \leq 4.20$, and therefore the respondents can be deemed to perceive the parameters to be between important to more than important / more than important.

The relatively high MSs achieved supports the argument highlighted in table 5.14 which suggest a shift in the traditional method applied in project management which is based on parameters of project quality, community H&S, time and costs. The fact that project H&S is the most significant indicates that organisations support the benefits which result from adding H&S as part of the traditional parameters which include, *inter alia*, positive impact on project time and budget, reduced absenteeism, increased efficiency and lower compensation insurance costs.

**Table 5.30: Importance of various project parameters to organisations**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unsure</th>
<th>Not important...Very important</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Project H&amp;S</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
</tr>
<tr>
<td>Project cost</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>6.7</td>
</tr>
<tr>
<td>Project schedule</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>13.3</td>
</tr>
<tr>
<td>(time)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td>0.0</td>
<td>6.7</td>
<td>6.7</td>
<td>6.7</td>
</tr>
<tr>
<td>Project quality</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>26.7</td>
</tr>
<tr>
<td>Community H&amp;S</td>
<td>0.0</td>
<td>0.0</td>
<td>14.3</td>
<td>28.6</td>
</tr>
</tbody>
</table>
5.12 Threat to oil and gas production

Table 5.31 indicates the extent to which actions / occurrences constitute barriers to oil and gas production in terms of percentage responses on a scale of 1 (minor) to 5 (major), and a MS ranging between 1.00 and 5.00. It is notable that the first and second ranked actions / occurrences have MSs $> 4.20 \leq 5.00$, which indicates that they constitute between a near major to major / major barrier to the production of oil and gas. These include: kidnappings of oil workers, and sabotage of pipelines. However, the third to eighth ranked (75%) of the actions and occurrences have MSs $> 3.40 \leq 4.20$, which indicates that they can be deemed to constitute a barrier to the production of oil and gas between some extent to a near major / near major.

The relatively high MSs achieved reveals that not only are energy companies increasingly operating in risky, volatile environments and conflict zones, but their assets are becoming key targets for political and criminal reasons. The findings indicate environmental destruction and degradation as the least significant. The reason for this may be because the environment is not treated as an integral part of productivity and profitability. Furthermore, the MS relative to oil bunkering gives credence to accusations of rising rate of oil theft in Nigeria. Social and economic factors could be responsible for this, however corruption and greed are also possible reasons. The implications for Nigeria will include economic loss of revenue, instigator of needless massive environmental disasters all of which may culminate in major threat to the nation and its oil and gas industry. For the international community it will be risk to global energy supplies. There is no doubt that when these supplies are disrupted the market reflects that insecurity with price volatility.

Table 5.31: Extent to which actions / occurrences constitute barriers to oil and gas production

<table>
<thead>
<tr>
<th>Action / Occurrence</th>
<th>Unsure</th>
<th>Minor</th>
<th>Minor</th>
<th>Minor</th>
<th>Minor</th>
<th>Major</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kidnappings of oil workers</td>
<td>0.0</td>
<td>0.0</td>
<td>20.0</td>
<td>6.7</td>
<td>6.7</td>
<td>66.7</td>
<td>4.40</td>
<td>1</td>
</tr>
<tr>
<td>Sabotage of pipelines</td>
<td>0.0</td>
<td>0.0</td>
<td>13.3</td>
<td>6.7</td>
<td>33.3</td>
<td>46.7</td>
<td>4.27</td>
<td>2</td>
</tr>
<tr>
<td>Large scale system failure</td>
<td>0.0</td>
<td>0.0</td>
<td>26.7</td>
<td>6.7</td>
<td>20.0</td>
<td>46.7</td>
<td>4.13</td>
<td>3</td>
</tr>
<tr>
<td>Hostile takeovers</td>
<td>0.0</td>
<td>0.0</td>
<td>26.7</td>
<td>6.7</td>
<td>20.0</td>
<td>46.7</td>
<td>4.13</td>
<td>4</td>
</tr>
<tr>
<td>of flow stations by community youths / women</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil and political crises</td>
<td>0.0</td>
<td>13.3</td>
<td>13.3</td>
<td>6.7</td>
<td>13.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil bunkering activities</td>
<td>0.0</td>
<td>6.7</td>
<td>13.3</td>
<td>6.7</td>
<td>26.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major industrial accidents</td>
<td>6.7</td>
<td>6.7</td>
<td>6.7</td>
<td>13.3</td>
<td>13.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental destruction / degradation</td>
<td>13.3</td>
<td>6.7</td>
<td>20.0</td>
<td>6.7</td>
<td>13.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.13 **Approach to HS&E management**

Table 5.32 indicates the extent of approaches to HS&E management relative to projects in terms of percentage responses on a scale of 1 (strongly disagree) to 5 (strongly agree), and a MS ranging between 1.00 and 5.00. It is notable that all the approaches have MSs above the midpoint score of 3.00, which indicates that in general respondents can be deemed to agree with the statements. It is notable that the first and second ranked approaches have MSs > 4.20 ≤ 5.00, and therefore the respondents can be deemed to perceive the approaches to be between agree to strongly agree / strongly agree. However, given that the third and fourth ranked approaches have MSs > 3.40 ≤ 4.20, therefore the respondents can be deemed to perceive the approaches to be between neutral to agree / agree. Furthermore, given that the fifth and sixth ranked approaches have MSs > 2.60 ≤ 3.40 this indicates that the respondents can be deemed to perceive the approaches to be between disagree to neutral / neutral.

The relatively high MSs achieved in the top four most significant approaches underscores the call for a paradigm shift in the construction industry to ensure designers foster HS&E concerns in their designs. The below average MSs achieved in the fifth most significant approach suggest that other factors contribute to site accidents. This may be attributed to the risky nature of oil and gas operations which is characterised by isolated locations, volatile terrain and the use of heavy duty equipment’s on site. The below average response achieved in the least significant approach, underscores the findings in Table 5.26 above, which suggests the deployment of procedure based policy organisation-wide with respect to HS&E.
Table 5.32: Approaches to HS&E management

<table>
<thead>
<tr>
<th>Approach</th>
<th>Unsure</th>
<th>Strongly disagree...Strongly agree</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your HS&amp;E management culture elucidates dedication and commitment</td>
<td>0.0</td>
<td>0.0</td>
<td>13.3</td>
<td>26.7</td>
</tr>
<tr>
<td>Designers should carry both a moral responsibility and a duty of care for site workers and the public in general</td>
<td>0.0</td>
<td>0.0</td>
<td>26.7</td>
<td>20.0</td>
</tr>
<tr>
<td>Designers should be responsible for buildability and the safe sequence of construction required by the design</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>6.7</td>
</tr>
<tr>
<td>Designers should play a more active role in construction / project H&amp;S</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>26.7</td>
</tr>
<tr>
<td>Site accidents are mainly caused by workers’ lack of H&amp;S knowledge</td>
<td>0.0</td>
<td>33.3</td>
<td>13.3</td>
<td>6.7</td>
</tr>
<tr>
<td>Responsibility for H&amp;S is only</td>
<td>0.0</td>
<td>0.0</td>
<td>73.3</td>
<td>6.7</td>
</tr>
</tbody>
</table>
5.14 Importance of aspects of HS&E culture

Table 5:33 indicates the importance of various aspects of culture in terms of percentage responses on a scale of 1 (not important) to 5 (very important), and a MS ranging between 1.00 and 5.00. It is notable that all the HS&E culture aspects have MSs above the midpoint score of 3.00, which indicates that in general respondents can be deemed to perceive the aspects of HS&E culture as important. However, given that all the aspects have MSs > 4.20 ≤ 5.00, the respondents can be deemed to perceive the aspects of HS&E culture to be between more than important to very important / very important.

The relatively high MSs achieved may be attributed to the deployment of procedural based HS&E management policy. However, excessive focus on the formal documentation of a HS&E management system distracts from addressing the human elements of its implementation, that is the focus becomes the process of the system itself, rather than actually controlling the risk.

**Table 5:33: Importance of HS&E culture**

<table>
<thead>
<tr>
<th>HS&amp;E Culture</th>
<th>Unsure</th>
<th>Not important</th>
<th>Very important</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication of organisation values</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>20.0</td>
<td>80.0</td>
</tr>
<tr>
<td>Encourage employees to develop positive H&amp;S attitudes.</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>20.0</td>
</tr>
<tr>
<td>Increase the employees’ (site and office-based)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>26.7</td>
</tr>
</tbody>
</table>
understanding of the H&S outcomes associated with their decisions, behaviours, and actions.

<table>
<thead>
<tr>
<th>Action</th>
<th>Rating</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encourage employee engagement in the HS&amp;E management process.</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Allow employees to personalize their roles in preventing and eliminating hazards and risk</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Enable employees to increase their knowledge of the specific ways in which hazards are managed, as well as their ability to apply and implement the actual HS&amp;E processes.</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Motivation of employees to work towards achieving HS&amp;E goals</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Use various sources of information to gain feedback on the effectiveness of</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
5.15 Prevalence of HS&E challenges on site

5.15.1 Prevalence of challenges

Table 5.34 indicates the extent to which challenges are prevalent on site in terms of percentage responses on a scale of 1 (minor) to 5 (major), and a MS ranging between 1.00 and 5.00. It is notable that five of the seven challenges have MSs ≤ 3.00, which indicates that prevalence of these aspects can be deemed to be rated as minor. It is notable that the top ranked challenge has an MS > 3.40 ≤ 4.20, which indicates that the prevalence can be deemed to be between some extent to a near major / near major extent. Given that their MSs are > 2.60 ≤ 3.40, the prevalence of the second to fourth ranked challenges can be deemed to be prevalent between a near minor to some extent / some extent.

The generally above average MSs achieved suggest that there is major scope for improving the technologies used in oil and gas exploration, human resources competencies, personal protective equipment with respect to implementation of new developments in HS&E management. The implication of this is the impact on brand name / image / reputation of poor HS&E performance.

Table 5.34: Extent to which challenges are prevalent on site

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Unsure</th>
<th>Minor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas flaring</td>
<td>0.0</td>
<td>20.0</td>
<td>0.0</td>
<td>6.7</td>
<td>20.0</td>
<td>26.7</td>
<td>26.7</td>
<td>3.47</td>
<td>1</td>
</tr>
</tbody>
</table>
Oil spillage | 13.3 | 13.3 | 20.0 | 20.0 | 6.7 | 26.7 | 3.13 | 2
Lack of HS&E knowledge on the part of site workers | 0.0 | 26.7 | 13.3 | 20.0 | 26.7 | 13.3 | 2.87 | 3
Lack of adequate HS&E equipment / gear and apparel | 0.0 | 13.3 | 26.7 | 33.3 | 20.0 | 6.7 | 2.80 | 4
Machine failure | 0.0 | 6.7 | 20.0 | 20.0 | 33.3 | 20.0 | 2.60 | 5
Human errors | 0.0 | 13.3 | 40.0 | 26.7 | 13.3 | 6.7 | 2.60 | 6
Natural disasters | 0.0 | 0.0 | 26.7 | 40.0 | 13.0 | 20.0 | 2.27 | 7

5.15.2 Frequency of oil spillage

The respondents were asked if they experience oil spillage on site, all the respondents (100%), indicate that oil spillage is experienced on site.

5.15.2.1 Extent to which actions / occurrences contribute to oil spills on site

Table 5.35 indicates the extent to which actions and occurrences contribute to oil spills on site. It is notable that six (66.7%) of the nine actions / occurrences have MSs ≤ 3.00, which indicates that these actions and occurrences can be deemed to contribute more of a minor than a major extent to oil spills on site. It is notable that the top ranked action / occurrence has a MS > 4.20 ≤ 5.00, which indicates that it can be deemed to contribute between a near major to major / major extent to oil spills on site. Given that the second ranked action / occurrence has a MS > 3.40 ≤ 4.20 it can be deemed to contribute between some extent to a near major / near major extent to oil spills on site.

The relatively high MSs achieved in the top two ranked action and occurrences underscores global discuss on energy infrastructural attacks, which suggests increasing attack by non-state actors and private energy holdings on energy assets. Furthermore, the average to above average MSs achieved relative to pipe corrosion, pipeline / flow line leakage, poor maintenance, discharge from transporting vessels / tanker accidents, material defects and human error suggest that there is a gap between infrastructures / installation with respect to facility management. This may result in a rise in demand for compensation by host communities, since in Nigeria when an oil
spill occurs and is determined to be an integrity issue the MNOC responsible for the facility is held solely responsible and is obliged to pay compensation for such spills to host communities.

Table 5.35: Extent to which actions / occurrences contribute to oil spills on site

<table>
<thead>
<tr>
<th>Action / Occurrence</th>
<th>Unsure</th>
<th>Minor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sabotage of oil pipelines</td>
<td>13.3</td>
<td>6.7</td>
<td>6.7</td>
<td>13.3</td>
<td>53.3</td>
<td>4.00</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil bunkering activities</td>
<td>7.7</td>
<td>15.4</td>
<td>7.7</td>
<td>15.4</td>
<td>46.2</td>
<td>3.69</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pipe corrosion</td>
<td>6.7</td>
<td>13.3</td>
<td>13.3</td>
<td>26.7</td>
<td>20.0</td>
<td>20.0</td>
<td>3.20</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Pipeline / flow line leakage</td>
<td>6.7</td>
<td>13.3</td>
<td>20.0</td>
<td>40.0</td>
<td>13.3</td>
<td>6.7</td>
<td>2.80</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Poor maintenance</td>
<td>0.0</td>
<td>20.0</td>
<td>13.3</td>
<td>26.7</td>
<td>26.7</td>
<td>13.3</td>
<td>2.73</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Natural disaster</td>
<td>40.0</td>
<td>26.7</td>
<td>13.3</td>
<td>6.7</td>
<td>6.7</td>
<td>6.7</td>
<td>2.53</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Discharge from transporting vessels / Tanker accidents</td>
<td>0.0</td>
<td>20.0</td>
<td>40.0</td>
<td>13.3</td>
<td>20.0</td>
<td>6.7</td>
<td>2.20</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Material defects</td>
<td>0.0</td>
<td>0.0</td>
<td>35.7</td>
<td>28.6</td>
<td>28.6</td>
<td>7.1</td>
<td>2.14</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Human error</td>
<td>0.0</td>
<td>13.3</td>
<td>46.7</td>
<td>13.3</td>
<td>20.0</td>
<td>6.7</td>
<td>2.07</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

5.15.3 Extent to which factors undermine H&S performance on site

Table 5.36 indicates the factors that undermine H&S performance on site. It is notable that four (80%) of the five factors have MSs above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive the factors to undermine H&S more to a major as opposed to a minor extent. It is notable that none of the factors have MS > 4.20 ≤ 5.00, although the top three have MSs > 3.40 ≤ 4.20, which indicates that the factors can be deemed to undermine H&S between some extent to a near major / near major extent. The remaining two factors, which have MSs > 2.60 ≤ 3.40, can be deemed to undermine H&S between a near minor to some extent / some extent.

The above average MSs achieved suggest that there is a major scope for improvement in human resource competencies with respect to improving H&S performance on sites. The probable reason for this is the dearth of trade schools in Nigeria and the
The implication is that organisations will continue to face challenges regarding talent shortages unless educational systems are designed to meet industry needs.

Table 5.36: Extent to which factors undermine H&S performance on site

<table>
<thead>
<tr>
<th>Factor</th>
<th>Unsure</th>
<th>Minor</th>
<th>Major</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0</td>
<td>7.7</td>
<td>23.1</td>
<td>53.8</td>
<td>15.4</td>
</tr>
<tr>
<td>Lack of skilled workers</td>
<td>0.0</td>
<td>7.7</td>
<td>15.4</td>
<td>53.8</td>
<td>15.4</td>
</tr>
<tr>
<td>Inadequate H&amp;S training of workforce</td>
<td>0.0</td>
<td>7.7</td>
<td>30.8</td>
<td>53.8</td>
<td>7.7</td>
</tr>
<tr>
<td>Over-reliance on sub-contractors</td>
<td>0.0</td>
<td>7.7</td>
<td>23.1</td>
<td>53.8</td>
<td>15.4</td>
</tr>
<tr>
<td>Lack of skilled supervisors</td>
<td>0.0</td>
<td>0.0</td>
<td>76.9</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

5.16 Corporate social responsibility (CSR)

5.16.1 Importance of approaches relative to host communities

Table 5.37 indicates the importance of approaches relative to host communities according to the three levels of management in terms of percentage responses on a scale of 1 (not important) to 5 (very important), and a MS ranging between 1.00 and 5.00. It is notable that the MSs are all above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive the approaches to be important as opposed to not important. However, given that the MSs are > 4.20 ≤ 5.00, the respondents can be deemed to perceive them to be between more than important to very important / very important.

The relatively high MSs achieved suggest deployment of a corporate strategic approach with respect to host community engagement. However, there is scope for improvement with relation to HS&E concerns relative to project design. Host community buy-in at the design stage of a project could be used as a tool to building
greater community cohesion, improve corporate reputation, and provide for more sustainable decision-making.

Table 5.37: Importance of approaches relative to host communities

<table>
<thead>
<tr>
<th>Approach</th>
<th>Unsure</th>
<th>Not important</th>
<th>Very important</th>
<th>MS</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host communities are treated as stakeholders during the project design stage</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>40.0</td>
<td>60.0</td>
</tr>
<tr>
<td>Demonstrate a strong conviction on HS&amp;E as it relates to host communities</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>33.3</td>
<td>60.0</td>
</tr>
<tr>
<td>Encourage dialogue with host communities on issues relative to H&amp;S / environmental pollution at the production stage of a project</td>
<td>0.0</td>
<td>0.0</td>
<td>13.3</td>
<td>33.3</td>
<td>53.3</td>
</tr>
</tbody>
</table>

5.17 Interviews
As indicated in section 4.15 and 4.16 interviews were conducted with top management from the department of HS&E management of the MNOCs based on the understanding that they would not disclose any information relative to statistics of workers kidnapped in their organisations; workers that died while in captivity, the rate of injury among workers, most common types of injury experienced amongst oil and gas workers, details of ransom payments made for kidnapped workers, and any question they perceived as sensitive.
Nevertheless, remarks, comments and perceptions from the managers are summarised below. The interviews highlight the sentiments and perceptions of respondents relative to current HS&E / security practices / performance within MNOCs.

The managers’ comments and responses indicate concerns regarding continuous flaring of gas and incessant oil spillages the majority of which they blamed on sabotage by host communities. Another area of concern highlighted is the area of poor environmental management and a lack of adequate enforcement of environmental management by both the state and MNOCs. The consensus of opinion among the managers is that the environmental impact of oil and gas activities has been neglected in the past. Although, the managers suggest that there exists a high rate of H&S awareness within the workplace, they indicate that there is no consideration for the H&S of host communities, specifically during site operations.

The findings suggest that significant attention is not given to monitoring, evaluating and implementation of the environmental laws in Nigeria by the Nigerian state and enforcing agency, hence the neglect in the past. In line with this finding respondents were asked to describe some of the practices and processes applied to address the HS&E challenges experienced in the industry, and respondents indicated that to improve HS&E performance MNOCs are adopting practices to minimize the impact of exploration and production activities. Some of these practices are discussed below.

5.17.1 Current HS&E practices
Respondents indicated that MNOCs are now adopting a holistic approach to HS&E management. Some of the concepts covered include OHS, industrial hygiene, environmental concerns and quality charter. As part of the quality charter, MNOCs have incorporated procedures for environmental monitoring, sample collection and analysis at the corporate level.

Aspects of the new approach include a paradigm shift from operational H&S concerns to behavioural H&S with a focus on the human factor. This has ensured that contemporary HS&E management policy is focused on People, Environment, Assets, and Reputation (PEAR). Also, the work instruction document is specific to every operational base and site operators ‘own’ the work instruction document. This is done to encourage worker engagement.
5.17.1.1 Project HS&E
Relative to projects, MNOCs ensure that the HS&E plan which addresses ergonomics amongst other HS&E concerns is incorporated into every oil and gas project. However, they suggest that relative to technology, they experience constrains in interactions with projects teams on site.

5.17.1.2 Environmental practices
Relative to environmental management respondents suggested that as far as environmental standards and regulations are concerned, MNOCs are more stringent with environmental legislation as it relates to Nigerian’s environmental laws. This they indicate is mainly due to top management expectations and robust performance.

Furthermore, the managers indicated that currently there is pressure on MNOCs to stabilize the ecological environment in the Niger Delta region. However, this constitutes a major challenge considering some of the damage on the land occurred as far back as the early 1970s.

5.17.1.3 H&S standards and regulations
Respondents were asked to indicate the H&S regulations applied during operations. The managers indicated that the lack of a specific H&S law in the country had forced MNOCs to adopt and implement H&S laws which apply to the parent head offices located in countries in Europe and the USA.

5.17.1.4 Continuous gas flaring
When asked why MNOCs were still flaring gas despite the promulgation of a law banning gas flaring in 1979, respondents indicated that gas flaring is still very common because in Nigeria gas plants are designed to flare associated gas. However, to redesign for gas plants to eradicate flaring, there is a need for front end alternative gas utilisation.

The current practice is monetisation. Clearly, this is not sustainable; however, they indicated that funding challenges exist between the JV partners and huge capital is required to redesign gas plants to eradicate flaring. This indicates that government is responsible for the continuing flaring of gas since it is not prepared to hold MNOCs accountable for flaunting the law.
5.17.1.5 Causes of H&S incidents
Respondents were asked to indicate the major cause of incidents. The managers indicated that 80% of incidents recorded are as a result of human mistakes / errors which they indicate are often as a result of contractors and site workers’ lack of H&S knowledge.

5.17.1.6 Pipeline vandalism
When asked how organisations address challenges relative to oil spills, respondents indicated that a joint intervention team for pipeline vandalism exists. The team is made up of representatives of oil companies, host communities and relevant government agencies. Once a pipeline is tampered with the team mobilizes to the location to access and investigate the cause of the spillage. If it is an integrity issue the MNOC that owns the pipeline is held totally responsible. However, the number of facilities and number of communities with which MNOCs interact constitute a major challenge relative to strategy for response to incidents, particularly with response to oil spillage.

Nonetheless, respondents indicated that it costs about five million dollars to lay one kilometre of pipeline in the Niger Delta. Therefore, any damage to a pipeline has a huge impact on resources.

5.17.1.7 Relationship with host communities
Respondents were asked to explain current practices as they relate to stakeholders. The managers indicated that MNOCs are currently focused on improving relationships with stakeholders and specifically, with host communities in an effort to encourage a cordial relationship where MNOCs are seen as corporate citizens by host communities. However, they indicated that some of the challenges experienced include the spread of operations, seeing that the number of communities hosting oil / gas facilities in the Niger Delta is estimated at 1 500. Some of the MNOCs have operations in almost all of these communities.

5.17.1.8 Security challenges
According to the security managers, the heightened security observed in the Niger Delta region is to secure oil and gas infrastructures / installations, provide security for
oil and gas workers and law abiding citizens of communities, and discourage trespassers. The security departments within MNOCs work in collaboration with members of the JTF to ensure this is achieved. To maintain peace and order within the region teams from the joint task force are deployed to troubled communities to curb the high rate of militant activities, attacks on oil installations, kidnappings, criminality and other violent activities.

Respondents indicated that even though the government has granted amnesty to all militants who were willing to surrender their arms and weapons, there are some youths who insist on continuing with criminality. This is partly because there is a lack of central command amongst youths since the majority of the ‘creek generals’ have surrendered their weapons and arms to government and embraced amnesty, thereby relinquishing power and authority. This has created a vacuum, and since some of the militant were not demobilized and have developed sustainability, through localized oil bunkering activities, intimidation and extortion, some youths continue with crime.

This is why to date the region is still experiencing pockets of attacks on oil and gas facilities. They further suggest that the weapons and arms used by the disgruntled youths come from the Middle East; this has exempted foreigners from that part of the world from kidnappings. Respondents indicate that investigations carried out show that politicians have also contributed immensely to the crisis. There are indications which suggest that during elections the politicians arm the youths of their region to assist in intimidating opponents. As soon as they achieve their selfish desires they abandon the youths and the weapons are never recovered. Eventually, the youths turn on the politicians. All of these factors have contributed incalculably to the escalation of violence and proliferation of weapons and arms in the region.

5.18 Corporate Social Responsibility

Respondents were asked to explain their organisation’s practice relative to CSR. Below are some of the commitments of MNOCs towards contributing to sustainable economic development within host communities:

- Employment schemes are provided for persons yearly within host communities;
- MNOCs as part of their CSR participate fully in local community festivals and are seen as corporate citizens;
• MNOCs promote partnerships between local institutions and their home countries for skill transfer and education in areas relative to oil and gas;
• Scholarships for students in tertiary institutions are provided for Nigerians with particular focus on people from the Niger Delta regions and specifically host communities;
• Yearly workshops are organised and conducted for professionals such as teachers within host communities;
• Micro-credit systems are sponsored in communities to assist in poverty alleviation and uplift the standard of living of community dwellers;
• MNOCs sponsor skills acquisition programmes as part of their social responsibility. Figure 5.8 depicts a skills acquisition centre sponsored by an MNOC in one of the host communities, and

**Figure 5.8: Media centre used to train youths in one of the host communities**

Source: Author (2010)

• MNOCs also provide rural electrification programmes as part of their CSR. Figure 5.9 depicts a generating plant purchased and installed by a MNOC in a host community.
5.19 Site walk around and observation

During the site visits to oil and gas infrastructure / installations as earlier mentioned in 4.16, the researcher was not permitted to engage with workers so that the researcher played the observer-as-participant role. Observations made are indicated below:

- Thorough search is conducted on all visitors to oil and gas facilities within the communities;
- Only visitors with prior appointments are allowed access into facilities;
- All workers were observed wearing personal protective equipment (PPE) on the site;
- At flow-station sites the reverse was the case construction workers could not wear PPEs due to excruciating heat emitted from the gas flare located less than 100 yards away from where workers were working;
- Workers were seen working on pipelines on site which were not fenced while guarded by JTF members;
- Oil spillage from both pipeline vandalism and faulty pipes is still a common feature;
Armed military personnel are stationed at the entrance of every facility and at strategic positions within and outside the premises. Figure 5.10 depicts a JTF post near the waterways used as ROW for oil pipelines;

**Figure 5.10: JTF post along a pipeline network route**

![JTF post along a pipeline network route](image)

Figure 5.11 depicts a JTF post on the route to one of the sites visited;

**Figure 5.11: JTF Post within a community hosting oil and gas installation**

![JTF Post within a community hosting oil and gas installation](image)

Source: Author (2010)
• Members of the JTF were observed within communities, patrolling major highway routes. They have become a part of the community, and are seen interacting freely and openly with members of the communities;

• The majority of the infrastructure and installations are fenced to discourage trespassers; a few years ago this was not the practice at installations such as oil rigs located on land and flow stations were easily accessible;

• Security check points are visible at various strategic locations leading to oil and gas facility / installations. Figure 5.12 depicts check points leading to one of the installations visited;

Figure 5.12: Check points on road within host community

Source Author (2010)

• Flaring of gas is still a common practice making the environment almost unbearable to inhabit for long;

• The flared gas can be seen kilometres away from the point of flare, some of the flaring was flaring from ground level;

• Majority of the offices on these sites are fully air-conditioned, which enables office work to be conducted with some degree of comfort;

• It was observed that there is no effective information technology system in place for reporting incidences when they occur, and monitoring trends - the operational offices visited did not have intranet facilities, and
At some of the pipeline routes which were not fenced engineers were observed conducting repairs on a vandalised pipeline which apparently is still a common challenge for MNOCs. Figure 5.13 depicts engineers repairing a vandalised pipeline.

Figure 5.13: Engineers fixing a vandalised pipeline

Source: Author (2010)

5.20 Testing of hypotheses
The aim of testing hypotheses is to examine whether a particular proposition concerning the population is likely to hold good or not. According to Aron, Coups and Aron (2011), a hypothesis is a prediction intended to be tested in a research study. Therefore, a hypothesis is a systematic procedure for deciding whether the results of a research study, which examines a sample, support a hypothesis that applies to a population. Consequently, a research hypothesis aids the research study by providing a very specific and precise prediction to test.

This study was designed to examine the concerns and performance of HS&E management systems and processes in Nigeria’s oil and gas industry, contribute towards the existing body of knowledge on HS&E and develop a model which focuses on how MNOCs should work with assessments based on stakeholders’
requirements and satisfaction. The research was organised around a set of nine hypotheses.

5.20.1 The procedures adopted for testing the above hypotheses

Data was captured in Excel spread sheets and then imputed into Statistical Software Version 10, was used for analysis of the data. A single sample t-test was used to test whether the sample mean is significantly greater than 3, because 3 is the midpoint of the 5-point Likert scale used in the test. This is done because if the sample mean is greater than the middle, when the mean tends above the mid-point score of 3 then respondents are deemed to agree with the stated hypothesis. The significant level of 5% was used where the p-value is > 0.05, which indicates statistically significant results.

For the one-sample t-test, μ denotes the mean of the population from which the sample was selected, and μ_0 denotes the hypothesized value, 3 in this case. Formally, the hypotheses statements are:

- \( H_0: \mu = \mu_0 \) the population mean is equal to the hypothesized value \( \mu_0 \)
- \( H_a: \mu > \mu_0 \) the population mean is greater than the hypothesized value.

One shortcoming of hypothesis testing is that it does not give an indication of the magnitude of the effect, which in this case is the difference between the hypothesized value and the sample mean. Although statistical significance testing has historically dominated the determination of result importance, modern views emphasize the role of effect sizes. Effect size indices are directly proportional to the size, and therefore the importance, of the difference or effect. In other words, effect size is the degree to which the null hypothesis is false. Consequently, a large index will lead to concluding that the effect is practically important.

According to Aron et al. (2011), effect size indices can be used to determine the degree of practical significance of an effect when:

- the scale is unknown – e.g. a number of 5 point Likert-scale items are used to get an average score for each individual;
• in very large samples even small effects are often found to be statistically significant. Effect size indices will then help to determine if these effects are also of practical importance;
• in small samples a statistically non-significant result may turn out to be of practical importance. This may suggest that there is a real effect, but the sample was too small to detect it;
• in meta-analysis, the effect size indices are used to combine the results of different studies, and
• if the whole population is surveyed, effect size indices are the only way to determine the practical importance of effects.

The effect size index when two groups are compared with respect to their arithmetic mean on a single quantitative variable is the standardized difference between the two means. According to Aron et al. (2011) and Diamantopoulos and Schlegelmilch (2000), effect sizes are generally defined as small ($d = .2$), medium ($d = .5$), and large ($d = .8$). Since all the hypotheses in the study have a large effect size, it is an indication that the effect is practically important and that they are very substantial.

The effect size measure for single sample t-test is Cohen’s $d$, which is the standardized difference between the sample mean and hypothesized mean (3.0). For the hypotheses test Cronbach alpha must be at least 0.7 to be an acceptable degree for internal reliability. Table 5.38 below indicates that in all cases for the second to the ninth hypothesis, $p$ is $< 0.05$, which indicates that for each hypothesis the sample mean is greater than the hypothesized value of 3.00.

**Table 5.38: Summary of the results of the testing of the hypotheses**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Cronbach alpha</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>N</th>
<th>t-value</th>
<th>Degree of freedom</th>
<th>P (1-tailed)</th>
<th>Cohen’s $d$</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor training / retraining of workers</td>
<td>0.75</td>
<td>3.47</td>
<td>1.06</td>
<td>15</td>
<td>1.70</td>
<td>14</td>
<td>0.0551</td>
<td>0.44</td>
<td>Medium</td>
</tr>
<tr>
<td>There is a</td>
<td>0.77</td>
<td>4.34</td>
<td>0.86</td>
<td>67</td>
<td>12.75</td>
<td>66</td>
<td>0.0000</td>
<td>1.56</td>
<td>Large</td>
</tr>
<tr>
<td>Description</td>
<td>Mean</td>
<td>SD</td>
<td>Sample Size</td>
<td>Significance</td>
<td>Effect Size</td>
<td>Conclusion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>------</td>
<td>-----</td>
<td>-------------</td>
<td>--------------</td>
<td>-------------</td>
<td>------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General insecurity on site</td>
<td>0.79</td>
<td>3.82</td>
<td>0.55</td>
<td>14</td>
<td>5.56</td>
<td>0.0000</td>
<td>1.49</td>
<td>Large</td>
<td></td>
</tr>
<tr>
<td>Best practice is not integrated into HS&amp;E management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recurrent incidents of pipelines / flow line blowouts are common</td>
<td>0.93</td>
<td>4.08</td>
<td>0.89</td>
<td>15</td>
<td>4.73</td>
<td>0.0002</td>
<td>2.95</td>
<td>Large</td>
<td></td>
</tr>
<tr>
<td>Lack of management commitment to HS&amp;E culture</td>
<td>0.84</td>
<td>4.50</td>
<td>0.51</td>
<td>15</td>
<td>11.43</td>
<td>0.0000</td>
<td>2.95</td>
<td>Large</td>
<td></td>
</tr>
<tr>
<td>Ineffective HS&amp;E inspectorate</td>
<td>0.86</td>
<td>4.50</td>
<td>0.46</td>
<td>15</td>
<td>12.04</td>
<td>0.0000</td>
<td>3.11</td>
<td>Large</td>
<td></td>
</tr>
<tr>
<td>Poor business environment assessment</td>
<td>0.74</td>
<td>4.57</td>
<td>0.43</td>
<td>67</td>
<td>14.19</td>
<td>0.0000</td>
<td>3.66</td>
<td>Large</td>
<td></td>
</tr>
<tr>
<td>Technology and innovation are ignored in HS&amp;E management</td>
<td>0.79</td>
<td>4.33</td>
<td>0.55</td>
<td>15</td>
<td>9.40</td>
<td>0.0000</td>
<td>2.43</td>
<td>Large</td>
<td></td>
</tr>
<tr>
<td>New developments in HS&amp;E are not integrated into existing HS&amp;E process</td>
<td>0.77</td>
<td>4.35</td>
<td>0.65</td>
<td>15</td>
<td>8.05</td>
<td>0.0000</td>
<td>2.08</td>
<td>Large</td>
<td></td>
</tr>
</tbody>
</table>

Therefore, the mean is significantly greater than 3, which suggests that the results support the alternative hypotheses. However, it is notable that for the first hypothesis, \( p > 0.05 \). Relative to effect size measures these differences are of large practical importance, for the second to the ninth hypotheses. However, for the first hypothesis the effect size measures that the difference is of medium practical importance.

**5.20.2.1 First hypothesis**

Poor training / retraining of workers on HS&E devices, is measured by one item: Q18.2 in Phase Two questionnaire. The item has a mean score of 3.47. Therefore, the alternative hypothesis poor training and retraining of workers is rejected.
5.20.2.2 Second hypothesis
There is a general insecurity on site, is measured by one item: Q23.1 in Phase One questionnaire. The item has a mean score of 4.34. Therefore, the alternative hypothesis there is a general insecurity on site is accepted.

5.20.2.3 Third hypothesis
Best practice is not integrated into HS&E management, is measured by six items: Q3 in Phase Two questionnaire; the six items are correlated because they measure the same thing. Therefore, the six items were collapsed into one score which is the average of the six items. The average has the mean score of 3.82. Therefore, the alternative hypothesis best practice is not integrated into HS&E management is accepted.

5.20.2.4 Fourth hypothesis
Recurrent incidents of pipelines / flow line blowouts are common, is measured by three items: Q 12.1, Q12.5 and Q 12.8 in Phase Two questionnaire; the three items are correlated because they measure the same thing. Therefore, the three items were collapsed into one score which is the average of the three items. The average has the mean score of 4.08. Therefore, the alternative hypothesis recurrent case of oil spill is accepted.

5.20.2.5 Fifth hypothesis
Management does not support HS&E culture, is measured by three items: Q 14.1-14.9 in Phase Two questionnaire; the nine items are correlated because they measure the same thing. Therefore, the nine items were collapsed into one score which is the average of the nine items. The average has the mean score of 4.50. Therefore, the alternative hypothesis lack of management commitment to HS&E culture is accepted.

5.20.2.6 Sixth hypothesis
HS&E inspectorate is ineffective, is measured by three items: Q5.1-5.11 in Phase Two questionnaire; the eleven items are correlated because they measure the same thing. Therefore, the eleven items were collapsed into one score which is the average
of the eleven items. The average has the mean score of 4.50. Therefore, the alternative hypothesis ineffective HS&E inspectorate is accepted.

5.20.2.7 Seventh hypothesis

HS&E management is ignored when conduction business environmental assessment, is measured by four items: Q6.1-6.4 in Phase One questionnaire; the four items are correlated because they measure the same thing. Therefore, the four items were collapsed into one score which is the average of the four items. The average has the mean score of 4.57. Therefore, the alternative hypothesis poor business environment assessment is accepted.

5.20.2.8 Eighth hypothesis

Technology and innovation is deliberately ignored to reduce cost, is measured by six items: Q2.1-2.6 in Phase Two questionnaire; the six items are correlated because they measure the same thing. Therefore, the six items were collapsed into one score which is the average of the six items. The average has the mean score of 4.33. Therefore, the alternative hypothesis technology and innovation is ignored in HS&E management is accepted.

5.20.2.8 Ninth hypothesis

New developments in HS&E is not integrated into existing HS&E process, is measured by five items: Q4.1-4.4 & 4.6 in Phase Two questionnaire; the five items are correlated because they measure the same thing. Therefore, the five items were collapsed into one score which is the average of the five items. The average has the mean score of 4.35. Therefore, the alternative hypothesis new development in HS&E is not integrated into existing HS&E process is accepted.

The results indicate that the first hypothesis is rejected; however, the second to the ninth hypotheses are supported.
CHAPTER 6

THE MODEL

6.1 Introduction
This chapter presents the proposed strategic HS&E management model. The model is advocated as a tool most suitable to facilitate the culture of continuous improvement and to promote HS&E management capability and best practice and standards for organisations. The model centres on the assessment, inputs, practices, outcomes and interactions which ultimately result in the strategic HS&E management process. Also, presented are the concept of the strategic management model, the motivation for the strategic HS&E management model and finally the validation of the model.

6.2 The Model
The model is an approach to a holistic understanding of the HS&E management process and its relationship with other disciplines within the business environment. Strategic HS&E management is a tactical process of incorporating contemporary industry concerns into practices and projects. The approach recognizes the best practice and standards identified in the study and when internalized, it can improve the current state of affairs in the organisation through a systematic way of addressing HS&E performance. Hopp and Spearman (2001) are of the opinion that a model needs to be thoroughly scrutinized to ensure that it provides a sufficiently accurate representation of the real problem. Therefore, some of the elements that need to be addressed in designing a model include:

- Ensuring that all relevant factors and interrelationships in the problem are adequately integrated into the model;
- Ensuring that the model provides reasonable solutions;
- Ensuring that if the model is applied to a past situation, it will improve upon previous models, and
- Ensuring that the estimates of the parameters in the model are correct.

Hopp et al. (2001) suggest that any pyramid of ideas addresses two practical issues. The first is the question of how the identified conflict is resolved. The second addresses the question of how the high level objectives are translated into detailed policies. The overall answer to those questions is the use of models to quantify trade-
offs. The challenge, therefore, is to develop a model that is accurate enough to represent these trade-offs appropriately, but simple enough to give a good representation of the situation. Therefore, a model can clarify the relationship between tactical and strategic decisions and help ensure consistency between them. To do this a model demands constant scrutiny.

Hopp et al. (2001) further point out that although models are useful, they are only tools, not reality. Hence, the appropriate design of a model is dependent on the decision it expects to support. Parameters that contain constraints for the purpose of tactical decision-making are often subject to control at the strategic level. Models will seldom attain a state of 100% perfection. However, most business functions rely on models to interpret data, predict performance and evaluate actions (Hopp et al., 2001).

6.2.1 Strategic management model

The model for this study is based on the strategic management theory which was developed in the 1950s (Bratton and Gold, 2003). The strategic management model involves large-scale, future-oriented, integrated plans to achieve organisational objectives and respond to uncertain and competitive environments that are facing an organisation. Bratton et al. (2003) assert that strategy needs to start with stakeholders’ expectations and use a modified balanced scorecard which includes all stakeholders. According to Bratton et al. (2003), strategies are typically formulated at three levels:

- Corporate - involving the entire organisation;
- Business - involving a major activity, business, or division in a large multi-business organisation, and
- Functional - involving managers of different activities and services.

Therefore, if a global organisation is to function successfully, strategies at different levels need to interrelate. In the graphic and rigid management texts, strategic management appears as a sequence in which several activities follow and feed upon one another (Bratton et al., 2003). Strategic management involves management actions and ways of dealing with increasingly complex and changing environments. According to Bratton et al., (2003), strategic management is considered to be a continuous activity that requires a constant adjustment of three major symbiotic
elements, namely: the values of senior management, the environment, and available resources.

Bratton *et al.* (2003) and Bana (2008) indicate that the strategy formulation and implementation process consists of the five steps as outlined below:

- Developing a strategic vision and mission;
- Analysing the environment;
- Strategic formulation;
- Strategy implementation, and
- Strategy evaluation.

Figure 6.1 depicts how the five steps in a strategic management model interact.

**Figure 6.1 Strategic management model**

![Strategic management model diagram](image)

Source: Bratton *et al.* (2003) and Bana (2008)

Strategic planning is about analysing and programming the specifications of an already existing strategy. At the corporate level, the strategic management process includes activities that range from appraising the organisation’s current mission and goals to strategic evaluation. The five steps in the strategic management model include:
Developing a strategic mission and vision: this involves management evaluating their position relative to the organisation’s mission and goals. The mission describes the organisation’s values and objectives. It indicates the direction in which senior management is going. Objectives are the desired ends sought after through tangible operating measures of the organisation and typically describe short-term measurable outcomes;

Environmental analysis: here management evaluates the organisation’s internal and external weaknesses and strengths for opportunities and threats. The most vital factors to the organisation’s future are classified as its strategic factors;

Strategic formulation: senior managers evaluate the interface between strategic factors and making strategic choices that guide managers to meet the organisation’s goals. Some strategies are formulated at the corporate, business and specific functional levels. The term strategic choice raises the question of who makes decisions and why they are made. The notion of strategic choice also draws attention to strategic management as a political process whereby decisions and actions on issues are taken by a group of powerful managers within the organisation;

Strategy implementation: this is an area of activity that focuses on the techniques used by managers to implement their strategies. In particular, it refers to activities that deal with leadership style, the structure of the organisation, the information and control systems. Thomson (2001) emphasizes that leadership is the most important and difficult part of the strategic implementation process, and

Strategy evaluation: this is an activity that determines to what extent the actual change and performance match the desired change and performance.

The strategic management model depicts the five major activities as forming a rational and linear process. It is, however, important to note that it is a normative model, that is, it shows how strategic management should be done rather than describing what is actually done by senior managers (Wheelen & Hunger, 2004). In other words, it is flexible enough to fit any given situation. As mentioned earlier, the notion that strategic decision making is a political process implies a potential gap between the theoretical model and reality. The strategic management model, which is the premise on which the model for this study is based, deals with organisational performance and systems of practice. According to Bana (2008), the approaches to strategic
management have been evolving through the years to respond to the prevailing environment as well as variations due to new scientific innovations, socio-economic and political trends and legal frameworks.

It is notable that the concept neither offers a completely new management philosophical outlook, nor discards elements of the previous approaches. It essentially builds on the approaches that preceded its evolution.

6.2.2 Motivation for the model

The proposed model is based on guidelines, frameworks, best practice and standards and the argument presented and identified in the findings of the study. As discussed in Section 3.5 of this study the OGP (2000) outlined principles and guidelines for the oil and gas industry to provide the basis for incorporating workforce and community H&S considerations systematically into the project delivery process. This research finding indicates major scope for improvement in host community H&S.

The key message suggests that industry co-operation on H&S is beneficial and early stakeholder’s involvement and consultation can achieve lasting improvement in community H&S. OGP (2000) further suggests that strategic H&S should be embedded into a higher-level HS&E or management system governing overall project operations.

However, environmental issues are missing components of this approach. The findings of this study have indicated that there is major room for improvement with respect to the assessment of ecological implications during business environment assessment. Furthermore, the findings in this study indicate much room for improvement with respect to the technology used for production and exploration activities.

In Section 3.6, of this study the CDM regulations 1994 were discussed relative to the development of a project and site-specific HS&E plan as a recognised part of best practice in HS&E management. Holt (2005) postulates a number of best operating practices and standards that must be integrated into HS&E management to enable comparison with international HS&E performance of the occupational group of the
organisation including, *inter alia*, effective communication, risk management, and cost-effective management. The findings in this study indicate great scope for improvement with respect to risk management as an integral aspect of HS&E management.

However, Holt (2005) did not take cognizance of vital components of a management system as highlighted in Section 2.4.5 of this study. Johnson (2004) lists these management components as including, *inter alia*, corporate culture, competent and motivated line managers, senior management engagement and aggressive goals and objectives. These represent areas where the research findings reflect a need for major improvement.

In addition, the research findings in this study have identified salient factors which have had a huge impact on HS&E issues in Nigeria’s oil and gas sector. Some of these factors include poor leadership, social factors, middle and line management competency, HS&E culture, and HIV and AIDS.

The primary objective of the research is thus underpinned by the need to investigate the dynamics that have seemingly impacted on poor HS&E performance in Nigeria’s oil and gas industry. The model is therefore introduced to accommodate the various arguments and components in order to meet the requirements established in the research study.

### 6.2.3 The strategic HS&E management model

The Nigerian oil and gas industry is under pressure from stakeholders to improve on its HS&E management practices. Stakeholders are demanding that the industry should address decades of widespread unwholesome environmental practices, coupled with an increasing demand for integration of cleaner technologies in its processes and operations. Furthermore, attacks on energy assets, and the abduction of energy sector workers are rampant.

One of the most difficult challenges faced by organisations is the realisation that there is a need to develop new strategies and do away with old strategies in order to respond to business environment demands. Therefore, HS&E management practitioners need
the tools to orchestrate strategic activities using an all-encompassing procedure that will generate outcomes which will address the concerns raised by civil society. The purpose of the model is to:

- Introduce a holistic thinking approach in the HS&E management environment;
- To develop a process that incorporates global best practice and standards, and takes stakeholders’ concerns into account, and
- Clarify the relationship between tactical and strategic decisions.

Hopp et al. (2001) report that when developing models, researchers need to think carefully about the scenario being studied and help develop intuition about how they behave. However, from a practical level, without some form of model, either explicit or implicit, it is difficult to do any analysis at all. Most business functions rely on models to interpret data, predict performance and evaluate actions.

Management models are not in themselves a solution, but a tool to help develop understanding or a common language. They are only tools, and therefore provide an over-simplification of a view of reality in a given context.

Hopp et al. (2001) suggest that management should identify the current major issues facing organisations and integrate key drivers of change, best practice and standards to create a strategic approach to management. The strategic HS&E management model is divided into separate processes and sub-processes and shows the high-level flow between elements.

The model comprises four major components, namely business environment assessment, re-thinking strategy, best practice and standards, and excellence in HS&E management. The strategic HS&E management model provides the elements necessary to assist organisations to analyse and address their shortcomings in HS&E management at both the workplace and during the project delivery process. Strategic management is an on-going process that evaluates and controls the business and the industry in which the organisations is involved and assesses its environment and sets goals and strategies to address all existing and potential threats. Figure 6.2 below depicts the strategic HS&E management model.
Figure 6.2: Proposed strategic HS&E management model

- Environmental factors: climate change, natural resource utilisation, waste and pollution, low carbon, clean technology, environmentally friendly products and operations.
- Social factors: health / pandemics, human rights issues, workplace and host community H&S, and workers security.

- Stakeholder engagement
- Identify roles and responsibilities of all stakeholders
- Secure energy assets / workers’ safety and security
- Ensure stakeholders’ acceptance of project deliverables
- Re-thinking corporate social responsibility
- Legal compliance

- Project management maturity
- Technology management
- Cost effective management
- Risk management
- New development in HS&E management

- Senior management engagement
- aggressive goals and objectives
- competent and motivated line managers, supervisors and employees active in training, auditing and problem-solving;
- service providers must be held to the same HS&E standards as organisation
- HS&E must be genuinely implanted into corporate culture
- a resilient but malleable infrastructure
- HS&E software package used for tracking HS&E trends and indicators by managers proficient, thorough record keeping

Strategic HS&E management
6.2.3.1 Business environment assessment

This component indicates the key drivers of change in Nigeria’s oil and gas industry based on the findings of the study. MNOCs cannot ignore the heightened level of environmental consciousness. The severity of the situation is such that the United Nations (UN) within a period of six months organised two separate conferences to discuss sustainable development aimed at reconciling the economic and environmental goals of the global community. The first UN climate change conference was held in Durban, South Africa, from 28 November to 11 December 2011 to establish a new treaty to limit carbon emissions. The conference agreed to a legally binding deal comprising all countries, which will be prepared by 2015, and is expected to take effect in 2020. Another UN conference on sustainable development was held on 20-22 June 2012, in Rio de Janeiro, Brazil.

For any environmental intention to become effective it must be operationalized with time. Although this can be complex and challenging, it can be achieved through the synthesis of technical, ethical, social and competitive considerations of environmental and social issues. The integration and changing environmental actions present challenges not only between departments but also layers of larger organisations particularly in MNOCs. Therefore, it is imperative for MNOCs to state environmental performance goals, and identify what is required to understand the resultant changes necessary for achieving those goals.

6.2.3.2 Rethinking strategy

The major stakeholders in HS&E could be identified as the stakeholder organisation, customers, competitors, suppliers, host communities, influencers and facilitators. This has moral, legal, ethical and business implications for HS&E practice. However, the complexity of HS&E management in Nigeria’s oil and gas sector is such that it is focused on the organisation’s employees both at the work place and on site. This approach should be reviewed to address all stakeholders particularly with respect to the project delivery process.

The need to effectively manage stakeholder expectations is a consistent theme in the Project Management Body of Knowledge (PMBOK) Guide. This goes beyond the simple delivery of specified requirements. It covers all phases of a project's activities
and the manner in which they are accomplished. MNOCs should put the same emphasis in building a deeper relationship with key stakeholders relative to HS&E issues. This requires regular and effective communication, openness and accountability, and a good measure of trust to support robust relationships between MNOCs and their key stakeholders. Besides scope, time and budget, the core of project management success is stakeholder acceptance of project deliverables. As such, the risk of stakeholders rejecting deliverables should be identified and mitigated in a project's early stages.

One way to mitigate the risk of threats on energy assets and the abduction of energy sector workers could be to use capable project advocacy consultancies which are composed of health, community, government representatives and the media. Such committees will ensure that projects are designed so as not to constitute H&S hazards to the environment and the general public.

6.2.3.3 Best practice and standards
This relates to international industry best practice and includes project management maturity, technology management, cost effective management, risk management and new developments in HS&E management. All these items should be effectively deployed in the overall project delivery process.

6.2.3.4 Excellence in HS&E management
Excellence in HS&E management systems demands excellent HS&E leadership and provides the impetus for HS&E performance. This implies a highly visible senior management committed to and supportive of HS&E. Senior management should be engaged in and insists on HS&E performance in a manner that is clearly understood and echoed at all levels of the organisation.

The approach of strategic management to HS&E should be in accordance with the intentions of the organisation regarding the future direction it wants to take. It should interface with longer-term HS&E issues and macro-concerns about structure, quality, culture, values, commitment and matching resources to future needs.
The findings in this study have shown that management focus is vital for quality HS&E performance. Therefore, active personal involvement of senior management personnel in the HS&E programme is imperative. Management should ensure H&S is considered in performance appraisals of employees, conduct detailed audits of the HS&E management system, and establish a formal approach to hazard identification and risk analysis which should involve employees.

Line managers and supervisors must respond positively to HS&E issues that may be raised. Supervisors should be responsible for HS&E auditing, investigating accidents, planned job observations and training. The commitment of all personnel should be demonstrated by behaviour, and the approach should be seen as a way of life. A true HS&E culture must be established where HS&E is valued as highly as productivity by management.

Finally, it is notable that the model is restricted as it is focused on addressing contemporary HS&E challenges facing MNOCs in Nigeria. Also it may not be robust enough for certain applications. However, it is flexible enough to fit into a higher level management system.

6.2.4 The model validation

To validate the relationship assumed for the model variables, a group of experts under the auspices of the professional HS&E managers in Nigeria’s oil and gas industry were approached at their monthly meeting. The experts designated four certified HS&E experts to review the model. Two of the experts are HS&E managers with two MNOCs, and two provide HS&E consulting services for the oil and gas industry. All of the experts are certified HS&E professionals with several years of experience in the oil and gas industry.

Three weeks after they were given copies of the model, a meeting was held with the professionals in the boardroom of one of the consultants’ firm, in Port-Harcourt, Rivers state, Nigeria. The professionals indicated that the relationship between the model variables is feasible particularly in the scenario for which it is designed. In their opinion, the volatile business environment in Nigeria will drive policy changes in the oil and gas industry in developing countries. This they suggest will force oil
exploration and production organisations to constantly review business decisions with respect to the environment as indicated in the model. In their words ‘the environmental priorities and policies in industrialised countries have travelled a very similar path from control to prevention’. Social factors are another area which trends have indicated are impacting on operations. Oil and gas activities in Nigeria are impacting on communities with respect to, in their words, ‘food security, H&S, and disruption of the eco-system’. This is where emphasis on stakeholder’s engagement becomes valuable in the project delivery process, as indicated in the model.

The interviewees were of the opinion that MNOCs must review existing strategy to address in their words ‘brand reputation, abduction of energy sector workers and threats on energy assets’. In their words, threats are often made ‘by non-state actors within the oil producing region, who are using attacks on energy infrastructure as a tool to air political grievances in a calculated manner’. Their intention is to garner illegitimate resources by stealing oil products and kidnapping energy sector employees, and also to generate global media attention that provides a springboard for groups to publicly challenge a state.

This they assert is where government must step in with respect to security, hence the need for dialogue amongst stakeholders for a lasting solution. Furthermore, in their words ‘maritime piracy is on the rise in the Gulf of Guinea’ and ‘attacks in this region are not confined to the coastal region near Nigeria where they have been historically, but are currently spreading to the shores of neighbouring West African countries’. This reveals a major security gap in this region and underscores the need for stakeholder engagement. The experts suggest that indeed re-thinking what corporate responsibility means in the Niger Delta region is of paramount importance in providing a framework for dealing with existing threats. Trends are indicating that CSR may require a new definition with regard to underdeveloped, energy producing regions’.

The experts indicated that MNOCs are embedded in host communities that have legitimate grievances related to deep underdevelopment issues, which have exacerbated grievances. These grievances tend to fuel tensions and hostilities against the state that can then ripple over to hostilities towards MNOCs in that area. They
agree that better community relations are needed and the development of a more holistic approach that includes not only working with local stakeholders such as community members, local businesses, and NGOs, but in their words ‘also coordinating the delivery of local development needs with other energy industry operators operating in the same challenging region’. However, they indicated that resources must be channelled into logistics in this area due to the nature of oil and gas operations, as MNOCs will have to interact with several communities where their facilities are located.

They suggest a paradigm shift might include thinking differently about the costs of production in such environments to include contracting out the development of infrastructures that could provide benefits for the community as a whole. In their words essentially transforming the local community from simply ‘hosts’ to ‘partners’.

The interviewees thought that as infrastructure, institutional and human resources development remain weak, incorporating best practice and standards, and benchmarking to international standards may be difficult. However, they indicated that globalization is assisting in narrowing that bridge. They agreed that the business benefits in the model will in the long run justify the resources used.

They indicated that strategic HS&E ensures that HS&E management is fully integrated into strategic planning, that HS&E policies cohere both across policy areas and across hierarchies and that HS&E policies are accepted and used by both middle and line managers as part of their everyday task.

Finally, the interviewees considered that the model could be embedded into existing HS&E structures of the organisations since most MNOCs have a robust structure and can also be incorporated into a higher-level HS&E or management system. They indicated that a clear fit exists between the model’s assumptions and reality.
CHAPTER 7
CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction
This chapter provides a summary of key findings of the research, conclusions and recommendations. It also states the areas for further research.

7.2 Business environment and strategic management influence on organisation practices
Respondents agree that MNOCs analyse the business environment situation, however, marginally more important than ensuring the existence of a proper functioning business environment scanning system. Hence, it can be concluded that MNOCs do not have an effective business environment scanning system in place in Nigeria.

Furthermore, respondents indicate that MNOCs monitor the business environment annually; however, some of the respondents also suggest that the organisation scans its environment quarterly. Additionally, respondents indicate that the international environment is marginally more assessed than the national environment. Therefore, it can be concluded that MNOCs are more focused on the global business environment as opposed to the national business environment.

Respondents indicate that organisational mission appropriately reflects the business organisation environment, the organisation analyses its business environment situation and evaluates and implements its business environment analysis process. However, all the above mentioned factors are considered marginally more important to MNOCs than thorough consideration of threats and opportunities during the business environment analysis process.

Relative to business environment factors, respondents indicate that technology and innovation, competitors, and economic conditions are marginally more important than H&S. However, H&S is marginally more important than the ecological environment. Relative to the micro environment factors, the corporate culture is marginally less important than the organisations mission, resources and its management. Therefore, it
can be concluded that MNOCs consider corporate culture as being a value rather than a priority.

However, respondents indicate that relative to the macro environment factors economy is marginally more important than technology and ecology. However, ecology is rated marginally more important than politics.

Although, technology is marginally more important than H&S to the organisation as far as business factors are concerned, nevertheless, H&S is perceived as marginally more important than ecology to MNOCs.

Also, the ecology is perceived as less important than the political and socio-cultural factors according to the HS&E managers. This implies that MNOCs do not consider ecological concerns as a vital business factor. Consequently, it is important for MNOCs to review this practice and realise that the long-term cost of decades of unfriendly environmental practices will eventually affect their bottom line and overall business reputation particularly in cases of compensation and litigations.

In relation to competitive forces, respondents suggest that the force which must impact on HS&E strategy is industry competitors which are marginally more important than buyers. However, respondents agree that opportunities and threats are the most important market environment forces and it is marginally more important than competitors.

7.3 Technology and innovation influences on HS&E

Given that the economic environment is marginally more important than the technology environment it can be concluded that MNOCs operating in Nigeria are more focused on return on investment although respondents suggest that, relative to business strategy, technology and innovation strategy is part of the organisation mission; however, this is marginally more important to the organisations than integrating technology strategy into the corporate and project strategy. It can be concluded that technology management is perceived as being a value as opposed to a priority. This is reinforced by: the extent of integration of technology into
organisations’ business strategies and the importance of technology as a key factor in the overall business / project strategy.

Respondents appreciate the various aspects relative to the project delivery process, in particular project management maturity, HS&E, cost-effective management and concurrent engineering. However, given that the aforementioned aspects are more important than technology management audit, it can be concluded that technology management audit is not used as a tool to measure how effectively the technological strengths of the organisation are exploited. This has probably been a major contributing factor to the continuous use of defective technologies in the industry which over the years have resulted in the environmental rot experienced in Nigeria’s oil and gas sector.

Respondents were required to indicate the extent of integration of technology into the organisations business strategy, they indicated that, although technology is optimally exploited, it is part of the organisation mission; it is a key factor in the overall business / project strategy; and is a huge part of the corporate / project strategy. However, the aforementioned aspects are marginally more important than incorporating project managers as active members of the technology culture. It is imperative for management to appreciate that projects are planned and executed by people and therefore technology and its tools must complement and be understood by the humans who use them.

7.4 Leadership and management practices
Relative to leadership approaches, respondents’ suggest that the impact of poor leadership within government influences effectiveness of leadership / leadership styles within the organisation.

Respondents were requested to indicate the leadership styles prevalent within their organisation; autocratic leadership style is rated higher than the democratic and participative leadership styles. Therefore, it can be concluded that MNOCs operate an autocratic form of leadership, seen that for better or worse, an organisation reflects the leadership paradigm of its leaders.
However, respondents indicate that they adopt different leadership styles during project management as oppose to maintaining one leadership style.

### 7.5 Best practice (BP) influence on project delivery process

Based upon the extent of integration of global best practices into the project life-cycle, risk management is identified by the HS&E managers as relatively lower than HS&E management. It can be concluded that MNOCs do not perceive risk management as integral to the HS&E management process.

Although, respondents rated low their organisations’ environmental protection / pollution control programme, however, they indicate that the guidelines and standards for environmental protection / pollution control in Nigeria is applied within their organisation.

However, the audit of Environmental Performance Evaluation (EPE) by organisations operating in the oil and gas industry is not accurately practised.

### 7.6 Management attitude towards HS&E practise

Respondents indicate that their organisations have a written HS&E and a HIV and AIDS policy for workers. However, respondents rate the degree of adherence to the HIV and AIDS policy below average. Respondents also indicate that their organisation has a functional department for research and development.

Management appreciates the importance of instilling a positive HS&E culture amongst workers according to respondents. In particular through communication of organisation values, encouraging employees to develop positive HS&E attitudes, increasing the employees’ site and office-based appreciation of HS&E outcomes relative to their actions, and employee engagement in the HS&E management process. It can be concluded that MNOCs in Nigeria subscribe to HS&E being a value as opposed to a priority.

Furthermore, respondents indicate that management recognises the implication of HS&E management, HS&E management is recognised as significant at all levels of management, management has a good understanding of the principles of HS&E, both
lower and middle level managers are totally and visibly supportive of HS&E, management at all levels recognise the benefits that are possible from implementing sound HS&E management practices, and executives demonstrate a willingness to change the way of doing business in order to grow, expand and mature in HS&E.

However, respondents rated the use of one or more HS&E software package for tracking HS&E practices by managers lower than all of the above mentioned. It can be concluded that technology is not perceived as a vital component of ensuring an effective HS&E management process.

7.6.1 Importance of four parameters relative to two aspects of management

In relation to the importance of four parameters relative to project management, respondents indicate that cost is marginally more important than H&S. Furthermore, relative to strategic management respondents indicate that cost is marginally more important than ecology.

Given that cost is identified as very important relative to project and strategic management, it can be concluded that MNOCs are focused on the bottom line of any business which is a return on investment. However, they should appreciate that cost is a function of, inter alia, quality, H&S, and the environment.

7.7 HS&E influences on existing project management practices

Respondents indicate that HS&E management are implemented on projects, organisational specific HS&E management process and procedure are established based on the best processes and practices, HS&E managers share accountability with project managers, However, the aforementioned are perceived as marginally more important than training project managers and project team members in HS&E to enhance their skills in HS&E practices.

According to respondents, relative to HS&E designers are responsible for making better choices in the design and planning stages of a project rather than been responsible through being active participators in the construction / project HS&E.
7.8 **HS&E training and education**
In identifying factors which undermine H&S performance on-site, lack of skilled workers was marginally identified above inadequate H&S training of workforce. Respondents indicate that management is marginally more committed to training and education of workers in HS&E management, as opposed to training and education of middle level and line managers. Therefore, it can be concluded, that overall, HS&E training and education of workers is not a priority to management and therefore organisations are not investing in HS&E education and training. However, management should realise that successful management of HS&E is a line-management responsibility with active participation at all employee levels under line supervision (HSE, 2000 and Hughes and Ferrett, 2007). However, respondents indicate that management has a written operational training policy and procedure in place for workers.

7.9 **Importance of various parameters to organisations**
According to the HS&E managers, project H&S, cost, time, quality and the environment are identified as more important to the organisation than host community H&S. It can be concluded that host community H&S is not perceived as a priority by MNOCs.

7.10 **Influence of HS&E culture on project**
Respondents were requested to indicate the frequency of adherence to the HS&E policy. They indicated a poor degree of adherence. It can be concluded that MNOCs in Nigeria rate below average.

7.11 **Prevalence of gas flaring on site**
Gas flaring and oil spillage are the two major prevalent HS&E challenges on site as they rate marginally higher than lack of HS&E knowledge on the part of site workers and lack of adequate HS&E equipment / gear and apparel.

7.12 **Frequency of oil spillage**
Also, it can be concluded that sabotaging pipelines and oil theft are the two major causes identified as responsible for oil spillage as they rate marginally higher than pipeline corrosion, pipeline / flow line leakage and poor maintenance.
7.13 Security
Respondents indicate that it is significantly important for management to consider terrorism as an element of the environmental evaluation of the organisation.

7.14 Corporate social responsibility
Even though respondents agree that the impact of social responsibility issues relative to host communities is being assessed and taken into account within the organisation.

The fact that host communities are treated as stakeholders during the project design stage is marginally more important than dialoguing with host communities on issues relative to H&S / environmental pollution at the production stage of projects.

7.15 Recommendations for MNOCs
Based on the results of this study, the following recommendations are made as effective means of improving HS&E management practices in Nigeria’s oil and gas industry.

7.15.1 Business Environment
There is a need for a paradigm shift by MNOCs relative to scanning the business environment. Given that MNOCs have no control over the external factors which affect sites operations an effective purposeful scanning process should be implemented and all levels of management should be involved in the business environment analysis process. The assessment of business environment is necessary to ensure cordial relationships with host communities and other stakeholders, improved corporate reputation, reduced impact of operations on the environment, and organisation effectiveness.

With many competing stakeholders, it is imperative for managers to assess the business environment, and then design a strategy that allows the organisation to work successfully within it.

7.15.2 Technology
It is recommended that MNOCs understand that technology management audits allow organisations to identify and evaluate the organisation’s technological resources and
capabilities; assess and evaluate the market significance or potential of the organisation's technologies, and assess the organisation's competitive position in relation to its technologies.

Also, improve practice can be realised if MNOCs focus on investing in the future and in healthier and safer oil exploration and production processes. Particularly, gas plants should be redesigned to eradicate flaring, and stakeholders should identify front end alternative gas utilization, considering that the top HS&E challenge prevalent on site is gas flaring.

Furthermore, it is recommended that effective technology which will measure programmes and/or process effectiveness should be integrated into the HS&E management process. One of the most effective ways to adequately assess and evaluate HS&E indicators, and monitor for trends, and break this information down into measurable activities, is to incorporate software and programmes which will assist managers to effectively monitor updates, permits issued and ensure that workers are given the right tools for the right tasks.

7.15.3 Environment
This study has shown that the environment is not considered a priority by MNOCs in Nigeria’s oil and gas sector. The research suggests improved practice can be realised by MNOCs if they develop environmental monitoring programs to address all oil and gas operations and activities that have been identified to have potentially significant impacts on the environment. Monitoring frequency should be sufficient to provide representative data for the parameter being monitored. The monitoring process and systems should be designed and implemented by accredited professionals following monitoring and record-keeping procedures and using properly calibrated and maintained equipment. In addition, the EIA process if fully adhered to will go a long way in effectively regulating gas flaring and oil spillage. However, this can only be possible if the regulatory agency enforce the provisions of the enacted policy and MNOCs are compliant.
7.15.4 Leadership

HS&E performance needs to be measured on organisational values, culture, attitudes and behaviours rather than end results like incident rates and worker’s compensation costs. One of the best ways to developing a healthy and safe workplace is to create the right corporate culture that is formed by using values.

By focusing on what is important to the organisation for instance, protecting people, organisations need to work out the values from these beliefs of what’s important. Then, it starts to become clear on what the organisation needs to do to keep people safe and in what order. Therefore it is recommended that managers should begin to lead by values this will go along away in empowering workers to do the right thing.

7.15.5 Best practice

The research suggests improved practice can be realised if an all-inclusive risk assessment process is incorporated at the planning stage in the HS&E management system. This is critical for eliminating hazards, reducing risk, or where applicable, lessening the severity of any potential threat or injury. There is a need for continued risk management education in Nigeria’s oil and gas industry. This will provide important support in ensuring that Nigeria has adequate technical risk competence in order to manage larger general challenges to society’s H&S.

Today’s businesses are not just assessed on their economic performance, but also on their ability to manage many different types of risks. A strong track record in managing these risks is frequently cited as an indicator of a well-run company.

Secondly, MNOCs should hold contractors and service providers to the same standard as the organisation. Also service providers and contractors should be made to develop and submit detailed HS&E Management Plans including details on how they are going to carry out their work in a healthy and safe manner and ensure minimal disruptions of their activities on the environment as part of the tendering process. This information must be pre-qualified as part of letting tenders. A contractor’s HS&E handbook and induction training program should be made a prerequisite. Furthermore, a better structure for accountability, and project monitoring should be implemented.
relative to project management process. In addition, to address HS&E challenges in the industry, there should be an interface between the stakeholders in the industry. This is particularly relevant in the development of integrated operations, where closer interaction and new types of contract form the basis for more effective interaction between players, in terms of HS&E control.

MNOCs could benefit from focus on performance improvement from the present paradigm of inspection, reaction and compliance statistics seeing that these statistics measure HS&E after the fact.

Finally, the concept of H&S policies should promote H&S goals, employee / management relations, good public relations, order in facilities, goodwill, discipline and mutual understanding.

7.15.6 HS&E education and training
Management should appreciate that HS&E management is an organisation-wide concern and hence training and education in HS&E should be made compulsory for workers at all levels. Workers should be encouraged to undertake formalised training and education in HS&E. Also, professionals should invest in HS&E training which will ensure that employees keep abreast with new developments and current HS&E knowledge and practices.

Subjects such as compliance with statute law, compliance with common law principles, hazard identification, risk management, hazard control, personal damage occurrences / accidents investigation, and job H&S analysis should be regarded as the basic knowledge and skills and the knowledge for supervisors’ H&S competencies.

7.15.7 Corporate social responsibility
Clearly there is growing recognition that industry must operate within the scope of social, cultural, economic and physical factors at the national and local levels. With continuous attention on the impact of global warming and greenhouse gases industry should recognize that future access to petroleum resources depends on finding methods of exploiting resources in an environmentally sustainable manner and in
cooperation, rather than in conflict, with stakeholders seeing that conflict is a H&S hazard.

Furthermore, the research data shows that there are benefits for MNOCs in the consideration of promoting lasting improvement in the health of host communities in order to maintain a healthy workforce, given, that their workers live and reside within some of these communities. Subsequently, this practice can improve corporate reputation through proactive focus on host community H&S.

7.16 Recommendation for the Nigerian government / Policy makers

7.16.1 Leadership

There is a need to develop a leadership approach to meet the needs of present day challenges particularly with the impact of globalisation and change. It is equally important for Nigeria not only to join the wave of globalisation, but to be a significant participant.

More so, as one of the top oil producing countries, there is ostensibly a lack of influence on the global stage of oil politics. Therefore, it is not enough that Nigeria is a major exporter of oil, but Nigeria must be a beneficiary of globalisation.

In spite of over fifty years of independence, Nigeria is still battling to meet basic needs and to deliver the benefits of independence to its huge population. There is a seemingly lack of a proper road map in terms of the way forward for the country. Decades of mismanagement of the nation’s petroleum resources, a high rate of corruption and military Coup d’etat, inter alia, have had a huge negative effect on the nation’s economy.

Governance structures and leadership patterns across Nigeria have compromised the hopes and dreams of citizens. The various regimes have distorted the processes of growth and development, undermined institutions, failed to prudently utilise scarce resources which should have improved the living conditions of the people. With no direct commitment and lapses at the national level, the state and local governments find it easy to get away with a culture of bad governance and opportunistic leadership.
Nevertheless, Nigeria cannot deny that it is a part of a knowledge society. However, it is what it is doing about it, and to be a part of it that will determine the way forward. The challenge for Nigeria to become relevant in the global market is to place priority on the following strategic concerns:

- Research and development;
- Boosting agricultural growth through diversification of agro processing;
- Improvement and diversification of the economy;
- Promotion of environmental sustainability;
- Developing world-class infrastructure for sustaining growth in all sectors of the economy;
- Visionary corporate and political leadership;
- Peace and security;
- Fighting corruption;
- Transparency and accountability;
- Establishing strong institutions;
- Overhauling the countries educational system, this is required to sustain economic growth in a post-industrial, knowledge-based global economy;
- Overhauling the countries health system;
- Technology and innovation, and
- Science environment.

These strategic issues provide an ideal platform to improve decades of mismanagement of the country’s economy, adequately address the challenges of the business environment, developmental challenges, sustainability, poverty, safety and security. The vital issue at this point is the ability of Nigeria to measure up to the challenge.

7.16.2 HS&E challenges in Nigeria’s oil and gas industry

The study has shown that gas flaring and oil spillages are still prevalent in Nigeria. In the last decade, all initiatives such as a regulatory framework evolved by the Nigerian government to stop gas flaring have failed. Therefore, it is recommended that the Nigerian government introduce a tax on carbon dioxide (CO₂) emissions into the existing regulatory framework to engender a reduction in air emissions. The tax will
go a long way to improving overall energy use in the oil and gas sector, and greatly reduce practices such as gas flaring.

Relative to oil spillage, communities where pipelines are vandalised must be held accountable, and liability measures should be introduced. Furthermore, it will take a collective effort of industry to address the challenges faced relative to the incidence of oil spills. It is recommended that all industry stakeholders should collaborate and engage with host communities to address this menace.

7.16.3 Ecology
This study has shown a lack of synergy between government and the oil and gas industry activities and the attainment of sustainable development as a key goal of the environment policy of the government. The scale of pollution and environmental damage has never been properly assessed. The figures that do exist vary considerably depending on sources. Nevertheless, it is widely recognized that hundreds of spills occur each year. The regulatory system in the Niger Delta is deeply flawed. Nigeria has laws and regulations that require companies to comply with internationally recognized standards of good oil field practice, laws and regulations to protect the environment, but these laws and regulations are poorly enforced. In addition, there is the need to overhaul some of the countries environmental laws to address modern day challenges, and also, ensure a synergy between all the laws and the norms and culture of the society.

Furthermore, this study has shown that the implementing and enforcing agency for environmental management is grossly ineffective and the government cannot or is not willing to hold MNOCs accountable.

Therefore, to achieve better environmental performance the government should begin by taking stock of the adverse impact of past oil and gas activities on the environment, pursue remediation of polluted land and rivers within the oil producing regions and institute measures for the prevention and control of further degradation. In addition, the oil and gas industry in Nigeria should be made to incorporate an EMS which involves the assessment and control of risks and the creation of an in-built system of maintenance and review. It will assist organisations in the industries to achieve
environmental goals and also of building in continuous improvement and embedding cultural change on environmental issues within organisations. The EMS must comply with the International Standards Organisation’s (ISO) EMS standard, ISO 14000, and the ISO and on Eco-Management Audit Scheme (EMAS). However, it will be necessary to retain a variety of oversight and regulatory fall back mechanisms to ensure that the system actually delivers improved environmental performance to a prescribed level or beyond. This is because ISO 14001 emphasizes processes, but not particular environmental outcomes, and does not require independent verification.

To make regulations interface effectively with EMS, it must be made mandatory in prescribed circumstances. The EMS must explain strategies and also demonstrate the adequacy of hazard control and environmental management. Finally, government should promote sustainable exploration of natural resources in the country.

7.16.4 Regulatory framework
Findings of this research show that Nigeria has no legal framework for H&S. The rate of development and industrialisation requires the government of Nigeria to establish a national H&S legislation that allows for the establishment of a national body to regulate H&S matters in Nigeria with the mandate to develop H&S standards regulate and enforce compliance in all sectors of the country’s economy, which will serve as a pathway for the establishment of industry specific H&S standards and regulations.

The legislation is expected to impose general obligations in relation to H&S and welfare in the workplace, and within host communities and the general public. This national H&S framework can be integrated into the existing national environmental policy, but clearly a re-engineering of the existing regulatory environmental agency will be required to accommodate the H&S unit to enable effective institutional capacity and enforcement capability to ensure efficient administering of regulations. This agency should have a well-developed monitoring mechanism and technical capabilities.

It is imperative that the law is made simple, incorporating international best practices but infused with local cultural values and norms. Furthermore, for a long term
solution there is a need for the establishment of a commission to study how to manage the exploitation of resources in the interest of the nation.

7.16.5 Research and development
Both the NNPC and the DPR should encourage vital cooperative activity between the research community and industry. This will promote research as an accepted and essential partner for the authorities, the unions and industry.

7.16.6 Niger Delta region
Government should develop a strategy for the promotion of peace as the foundation for development of the oil producing regions, making local governance effective and responsive to the needs of the people, promotion of social inclusion and improvement in access to social amenities, promotion of environmental sustainability to preserve sustainable livelihoods for host communities, and mobilisation of the people for sustainable development in the Niger Delta. Furthermore, promotion of an integrated approach to HIV and Aids is imperative to arrest the spread of the disease. In addition, there is a need to improve law, order and security in the region in order to proactively prevent conflict. Also, a sustainable partnership for the advancement of human development should be pursued. The UNDP can be a significant partner in facilitating this. However, it is imperative that the three tiers of government must be responsible and held accountable for the development of oil-producing communities and not MNOCs.

7.17 Recommendations for researchers / Academics
Further research should be conducted in the area of HS&E management as a business strategy function. Areas of further research are recommended below.

7.17.1 Areas for further research
The following recommendations for further research are fundamentally motivated by the HS&E management findings of this research. A holistic perspective of the findings of this research study could be further enhanced by conducting further research into other crucial sectors of Nigeria’s economy. Analysing the gaps between the results of such research efforts and those presented in this study could provide the basis for achievement of an overall performance of other sectors of the nation’s
economy relative to HS&E management. Furthermore, important results and information can be determined through new knowledge, new system solutions and a necessary capacity increase in relevant subject areas. Therefore, more research should be conducted in the following areas:

- Extent of awareness of HS&E management in Nigeria’s construction industry, this is imperative seen that, the construction industry is responsible for the design and building of oil and gas installation / infrastructures;
- Integration of an HS&E management strategy into project life-cycles in Nigeria’s construction industry;
- A framework for the establishment of a comprehensive national H&S policy for Nigeria;
- Development of new knowledge and new methods for risk management: there is a clear need to establish better knowledge on risk management in both Nigeria’s petroleum and construction industries, and
- A generic model for incorporating contractor HS&E prequalification process into oil and gas project.

7.18 Conclusions
This chapter has presented the conclusions, summary and recommendations for this research study. The next sections present the list of sources used in the research as well as the appendices in the form of documentation used to conduct the research.
REFERENCES


Dear Madam / Sir

Re: Health, safety and environmental implications in Nigeria’s oil and gas industry.

The survey is part of a research project aimed at meeting the requirements for PhD (Construction Management) at Nelson Mandela Metropolitan University, carried out to:

- Determine the impact of HS&E on oil and gas development;
- Determine key performance indicators, and
- Develop a strategic HS&E management model.

Kindly complete the accompanying questionnaire and note that your anonymity is assured. Solutions to address the impact of oil exploration activities on the health, safety and environment will evolve from your response.

We would be grateful if you would endeavour to complete the questionnaire and return by the 14 May 2011 to:

Department of Construction Management  
Faculty of Engineering, the Built Environment, and Information Technology  
Nelson Mandela Metropolitan University  
P.O. Box 77000  
Port Elizabeth  
60431

Or per facsimile to: (041) 504 2345  
Att prof JJ Smallwood / Miss N.L. Dabup

Should you have any queries please do not hesitate to contact Miss N. L. Dabup on 080 51981364 or per e-mail pdlam@gmail.com

Thanking you in anticipation of your response.

Miss Lami N. Dabup  
PhD (Construction Management) Candidate

Prof John Smallwood  
Promoter
Annexure B

BUSINESS ENVIRONMENT AND STRATEGIC MANAGEMENT INFLUENCES ON ORGANISATION PRACTICES

Information gathered is for research purposes only and no individual or organisation will be compromised in any way.

Biographical information

1. Respondent’s name

2. Title and capacity

3. Telephone number

4. Fax number

5. E-mail address

6. Please indicate the scale of your organisation's operation
   - Local
   - National
   - International

SECTION 1: BUSINESS ENVIRONMENT AND STRATEGIC MANAGEMENT INFLUENCE ON ORGANISATION PRACTICES

Mark with an ‘X’ next to the appropriate number as per example

<table>
<thead>
<tr>
<th>Statement</th>
<th>Unsure</th>
<th>Not important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Business environment analysis</td>
<td>U</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>1.2 Conducting business environmental analysis as a basis for major projects</td>
<td>U</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>
2 On a scale of 1 (Never) to 5 (Always), indicate the extent to which your organisation
addresses the following relative to the analysis of its business environment (Please note
the 'Unsure' response).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Unsure</th>
<th>Never</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluating and implementing its business environmental analysis process</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Analysis of its business environmental situation</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Organisational mission appropriately reflects the business organisational</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>environment</td>
<td></td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Existence of a proper functioning business environmental scanning system</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Thoroughly considers threats and opportunities during the business</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>environmental analysis process</td>
<td></td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Proper forecasting during the business environmental analysis process</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

3 How often does your organisation monitor the business environment (Please note the
‘Unsure’ response)?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Unsure</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quarterly</td>
<td>U</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Annually</td>
<td>U</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

If ‘Other’, please record adjacent to ‘Other’ in the matrix above

4 On a scale of 1 (None) to 5 (All), which of the following business environmental factors
does your organisation analyse (Please note the ‘Unsure’ response)?

<table>
<thead>
<tr>
<th>Factor</th>
<th>Unsure</th>
<th>Never</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labour market</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Competition</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Economic conditions</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Suppliers</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Ecology</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
4.7 Leadership
4.8 Socio-culture
4.9 Politics
4.10 Technology and innovation

<table>
<thead>
<tr>
<th>Factors</th>
<th>Unsure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Socio-culture</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Politics</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Technology and innovation</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

5 On a scale of 1 (Not important) to 5 (Very important), indicate if the factors in the micro environment (internal environment) are being appropriately considered as an important part of the business environmental analysis (Please note the ‘Unsure’ response)?

<table>
<thead>
<tr>
<th>Factors</th>
<th>Unsure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission and objectives</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Organisation and its management</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Resources of the organisation</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Organisational culture</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

6 On a scale of 1 (Not important) to (Very important), indicate which factors in the macro environment (external environment) are being appropriately considered as an important part of the business environmental analysis in your organisation (Please note the ‘Unsure’ response)?

<table>
<thead>
<tr>
<th>Factors</th>
<th>Unsure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological environment</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Economic environment</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Social environment</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Political</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>International environment</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Ecological environment</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

7 On a scale of 1 (Not important) to (Very Important), how important are the following business factors to your organisation (Please note the ‘Unsure’ response)?

<table>
<thead>
<tr>
<th>Factors</th>
<th>Unsure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labour market</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Health and safety</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Economic conditions</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Suppliers</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Ecology</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Leadership</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Socio-culture</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Politics</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Technology</td>
<td>U</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
8 On a scale of 1 (Never) to 5 (All of the time), indicate which of the following labour market factors your organisation evaluates (Please note the ‘Unsure’ response)?

<table>
<thead>
<tr>
<th>Factors</th>
<th>Unsure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1 Unemployment</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8.2 HIV and AIDS</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8.3 Unions</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8.4 Education / Training</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8.5 Management</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8.6 Continuous downsizing</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8.7 Terrorism</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

9 On a scale of 1 (Not important) to 5 (Very important), which of the factors in the market environment are being appropriately considered as an important part of the business environmental analysis in your organisation (Please note the ‘Unsure’ response)?

<table>
<thead>
<tr>
<th>Factors</th>
<th>Unsure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1 Consumers</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9.2 Purchasing power</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9.3 Suppliers</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9.4 Intermediaries</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9.5 Competitors</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9.6 Opportunities and threats</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

10 On a scale of 1 (Never) to 5 (All of the time), to what extent does your organisation consider the different environmental levels in undertaking its business environmental analysis (Please note the ‘Unsure’ response)?

<table>
<thead>
<tr>
<th>Level</th>
<th>Unsure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1 Regional</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10.2 National</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10.3 International</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

11 On a scale of 1 (Unlikely) to 5 (For sure), would an analysis of the five competitive forces help HS&E managers formulate an effective HS&E strategy in your organisation (Please note the ‘Unsure response’)?

<table>
<thead>
<tr>
<th>Competitive forces</th>
<th>Unsure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.1 Potential entrants</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
12. **On a scale of 1 (Not important) to 5 (Very important), indicate the importance of the following parameters to your organisation relative to projects and in terms of strategic management** (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Level and parameters</th>
<th>Unsure</th>
<th>Never………………………………Always</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td><strong>Project management</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.1.1 Quality</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>12.1.2 Cost</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>12.1.3 Schedule</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>12.1.4 Health and Safety</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td><strong>Strategy management:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.2.1 Quality</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>12.2.2 Cost</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>12.2.3 Schedule</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>12.2.4 Environment</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
</tbody>
</table>

Table 7: Importance of four parameters relative to two aspects of management

13. **On a scale of 1 (Strongly disagree) to 5 (Strongly agree), assess the impact of management within your organisation relative to the following aspects** (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Impact</th>
<th>Unsure</th>
<th>Strongly disagree…………..Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>13.1 Management plays an important role in your organisation</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>13.2 All levels of management are involved in the business environmental analysis process</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>13.3 Management is operating at their full potential within your organisation</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
</tbody>
</table>

14. **On a scale of 1 (Not important) to 5 (Very important), please indicate the importance of the following leadership approaches relative to your organisation** (Please note the ‘Unsure’ response).
14.1 Effectiveness of leadership in your organisation
14.2 Impact of poor leadership within the government
14.3 Leadership styles in your organisation

15 What type of leadership style is prevalent within your organisation (Please check one only)?

<table>
<thead>
<tr>
<th>Leadership style</th>
<th>Prevalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1 Autocratic</td>
<td></td>
</tr>
<tr>
<td>15.2 Democratic</td>
<td></td>
</tr>
<tr>
<td>15.3 Authoritarian</td>
<td></td>
</tr>
<tr>
<td>15.4 Situational Leader</td>
<td></td>
</tr>
<tr>
<td>15.5 Laissez-fair</td>
<td></td>
</tr>
<tr>
<td>15.6 Entrepreneurial</td>
<td></td>
</tr>
<tr>
<td>15.7 Executive</td>
<td></td>
</tr>
<tr>
<td>15.8 Participative</td>
<td></td>
</tr>
</tbody>
</table>

16 Do you employ different project leadership styles through each phase of a project (Please note the ‘Unsure’ response)?

Figure 5.1

<table>
<thead>
<tr>
<th>Unsure</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

17 Does your organisation have a fully operational training policy and procedure (Please note the ‘Unsure’ response)?

Figure 5.2

<table>
<thead>
<tr>
<th>Unsure</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

18 On a scale of 1 (Not important) to 5 (Very important), indicate how important employee training / employee skills and intellectual capital is viewed in your organisation (Please note the ‘Unsure’ response)?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Unsure</th>
<th>Not important……Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.1 Importance of intellectual capital</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>18.2 Importance of training of staff to top management</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>18.3 Importance of multi-skilling</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
19 Please respond to the following HIV and AIDS questions (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Question</th>
<th>Unsure</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.1 Is HIV and AIDS planning considered important in your organisation?</td>
<td>U</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>19.2 Does your organisation have a written HIV and AIDS strategy in place to assist the employees?</td>
<td>U</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

If ‘Yes’, to Q 18.2, please provide a copy

20 Please respond to the following HSE question (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Question</th>
<th>Unsure</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.1 Does your organisation have a written HS&amp;E policy?</td>
<td>U</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

If ‘Yes’, please provide a copy

21 On a scale of 1 (Never) to 5 (Always), please respond to the following HS&E questions (Please note the ‘Unsure response’).

<table>
<thead>
<tr>
<th>Question</th>
<th>Unsure</th>
<th>Never…………………Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.1 Is your organisations’ HS&amp;E policy judiciously adhered too by all the staff?</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

22 On a scale of 1 (Never) to 5 (Always), please respond to the following environmental standards and guideline questions (Please note the ‘Unsure response’).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Unsure</th>
<th>Never…………………Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.1 Are the guidelines and standards for environmental protection / pollution control in Nigeria applied within your organisation?</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>22.2 Has your organisation been successful with its environmental protection / pollution control programme?</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
23. On a scale of 1 (Strongly disagree) to 5 (Strongly agree), to what extent do you agree with the following statements (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Impact</th>
<th>Unsure</th>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.1 Management within your organisation should consider terrorism as</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>an element of the environmental evaluation of your organisation</td>
<td></td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>23.2 The impact of social responsibility issues relative to host</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>communities is being assessed and taken into account within your</td>
<td></td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>organisation</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>23.2 The impact of global issues on the security and environmental</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>process within your organisation is being assessed and taken into</td>
<td></td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>account</td>
<td></td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

24 Do you have any comments in general regarding business environmental and strategic management influences on organisational health, safety and environmental issues?

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

Thank you for your kind cooperation

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Cell Number: +27(0)761125567
Email: pdlami@gmail.com
Annexure C

HEALTH, SAFETY AND ENVIRONMENTAL PRACTICE

Information gathered is for research purpose only and no individual or organisation will be compromised in any way.

Biographical information

1 Respondent’s name

2 Title and capacity

3 Telephone/Fax numbers

4 E-mail address

5 Please indicate the scale of your organisation’s operation

<table>
<thead>
<tr>
<th>Local</th>
<th>National</th>
<th>International</th>
</tr>
</thead>
</table>

SECTION 1: TECHNOLOGY AND INNOVATION INFLUENCES ON HEALTH, SAFETY AND ENVIRONMENT

Mark with an ‘X’ next to the appropriate number as per example

1 Please state if your organisation has the following department (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Department</th>
<th>Unsure</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research and development</td>
<td>U</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

2 On a scale of 1 (Never) to 5 (Always), indicate the extent to which your organization adapts technology and innovative measures relative to HSE (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Unsure</th>
<th>Never</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Technology is a key factor in the overall business / project strategy</td>
<td>U</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2.2 HS&amp;E / project managers are active members of the technology culture</td>
<td>U</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2.3 HS&amp;E / project managers work closely with the technology manager</td>
<td>U</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2.4 Technology and innovation strategy is part of organizational mission</td>
<td>U</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>
The technology strategy is a significant contributor to the corporate and project strategy.

Organizational procedures exist to ensure the optimal exploitation of technology.

SECTION 2: BEST PRACTICE (BP) INFLUENCE ON PROJECT DELIVERY PROCESS

3

On a scale of 1 (Not at all) to 5 (Extensively), indicate the extent to which the following Best Practices (BPs) have been successfully integrated into your project delivery process (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Practice</th>
<th>Unsure</th>
<th>Not at all</th>
<th>Extensively</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Technology management auditing</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3.2 Project management maturity</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3.3 Cost effective management</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3.4 Risk management</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3.5 Concurrent engineering</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3.6 Health, safety and Environment</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

4 On a scale of 1 (Never) to 5 (Always), indicate the extent to which HS&E managers use the following process (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Process</th>
<th>Unsure</th>
<th>Never</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Perform HS&amp;E benchmarking to establish new developments and components of HS&amp;E</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4.2 Adapts to these new benchmarked mentioned in development and components (above)</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4.3 Outline specific goals directed at establishing HS&amp;E standards on all projects and within the organization</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4.4 Effectively communicate HS&amp;E strategy and deploy it throughout all levels within the organization and on projects</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4.5 Allow project teams to establish their own objectives and measures to support the overall HS&amp;E strategy</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4.6 Ensure that the HS&amp;E / project members are highly-skilled, knowledge resourced, trainers and problem solvers</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

SECTION 3: MANAGEMENT ATTITUDE TOWARDS HS&E PRACTISE

5 On a scale of 1 (Never) to 5 (All of the time), indicate the extent of management commitment to adopting modern HS&E influences on business practice (Please note the ‘Unsure’ response).
<table>
<thead>
<tr>
<th>Management commitment</th>
<th>Unsure</th>
<th>Never..........All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 HS&amp;E management is recognised as significant at all levels of management</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>5.2 Management at all levels recognise the benefits that are possible from implementing sound HS&amp;E management practices</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>5.3 Management recognise the implications of HS&amp;E</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>5.4 Management recognise what must be done in order to achieve maturity in HS&amp;E</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>5.5 Management has a good understanding of the principles of HS&amp;E</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>5.6 All the lower and middle-level line managers have been trained and educated in HS&amp;E</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>5.7 One or more HS&amp;E software package is used for tracking HS&amp;E by managers</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>5.8 Lower and middle level managers are totally and visibly supportive of HS&amp;E</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>5.9 Lower and middle level line managers willingly release their employees for HS&amp;E training</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>5.10 Executives visibly support HS&amp;E through presentations, correspondence and by attending HS&amp;E team meetings / briefings</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>5.11 Executives demonstrate a willingness to change the way of doing business in order to achieve excellence in HS&amp;E</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
</tbody>
</table>

SECTION 4: HEALTH, SAFETY AND ENVIRONMENTAL INFLUENCES ON EXISTING PROJECT MANAGEMENT PRACTICES

6 On a scale of 1 (Never to 5 (All of the time), please indicate the extent to which your organisation implements HS&E relative to managing projects (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Actions / occurrences</th>
<th>Unsure</th>
<th>Never..........All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1 HS&amp;E policies are implemented on projects</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>6.2 HS&amp;E managers share accountability with project managers</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>6.3 Project managers / project team members undergo training in HS&amp;E to enhance their skills</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>6.4 Organizational specific HS&amp;E management process and procedure are established based on the best processes and practices</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>6.5 Strategic HS&amp;E is successfully integrated for managing projects</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>6.6 Line managers are committed to HS&amp;E and to promises made to HS&amp;E / project managers for deliverables</td>
<td>U</td>
<td>1  2  3  4  5</td>
</tr>
</tbody>
</table>
SECTION 5: HS&E TRAINING AND EDUCATION

7 Does your organization have a fully operational training policy and procedure (Please note the ‘Unsure’ response)?

<table>
<thead>
<tr>
<th>Unsure</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

8 On a scale of 1 (Never) to 5 (Always), indicate the extent at which your organization conducts internal training courses relative to the following (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Course</th>
<th>Unsure</th>
<th>Never</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1 Health and safety</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8.2 Good public relation practices in dealing with communities</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8.3 Good business practices</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

9 Please indicate the number of internal HS&E - related training courses your company conducts annually (Please check one).

<table>
<thead>
<tr>
<th>Number of courses</th>
<th>&lt; 5</th>
<th>&gt; 6 ≤ 10</th>
<th>&gt; 11 ≤ 20</th>
<th>&gt; 21 ≤ 30</th>
<th>&gt; 30</th>
</tr>
</thead>
</table>

SECTION 6: FORMAL QUALIFICATION OF HS&E MANAGERS

10 In your organisation are employees promoted to HS&E managers because of any of the stated reasons (Please note the ‘Unsure’ response)?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Unsure</th>
<th>Never</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1 Possess technical expertise</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10.2 Possess sound administrative skills as professional managers</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10.3 The organization has nowhere else to put them</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10.4 Well remunerated</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10.5 Ability to make sound business decisions</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

SECTION 7: IMPORTANCE OF PROJECT COST, TIME AND QUALITY RELATIVE TO HS&E

11 On a scale of 1 (Not important) to 5 (Very important), please rate the importance of the following parameters to your organization (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Unsure</th>
<th>Not important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.1 Project H&amp;S</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11.2 Project cost</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
SECTION 8: THREAT TO OIL AND GAS PRODUCTION

12 On a scale of 1 (Minor) to 5 (Major), please indicate the extent to which the following actions / occurrences constitute barriers to oil and gas production (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Action / Occurrences</th>
<th>Unsure</th>
<th>Minor……………………………….Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1 Environmental destruction / degradation</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12.2 Hostile takeovers of flow stations by community youths / women</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12.3 Civil and political crises</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12.4 Large scale system failure</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12.5 Sabotage of pipelines</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12.6 Kidnappings of oil workers</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12.7 Major industrial accidents</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12.8 Oil bunkering activities</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

SECTION 9: INFLUENCE OF HEALTH, SAFETY AND ENVIRONMENTAL CULTURE ON PROJECT

13 On a scale of 1 (Strongly disagree) to 5 (Strongly agree), please indicate the extent to which you agree with the following approaches (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Approach</th>
<th>Unsure</th>
<th>Strongly disagree……… Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.1 Responsibility for H&amp;S is only confined to construction work on site</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>13.2 Site accidents are mainly caused by workers lack of H&amp;S knowledge</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>13.3 Designers should carry both a moral responsibility and a duty of care for site workers and the public in general</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>13.4 Designers should play a more active role in construction / project H&amp;S</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>13.5 Designers should be responsible for buildability and the safe sequence of construction required by the design</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
13.6 Your HS&E management culture elucidate dedication and commitment

14 On a scale of 1 (Not important) to 5 (Very important), please indicate the importance of the following aspects of culture to your organisation (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Culture aspect</th>
<th>Unsure</th>
<th>Not important……Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.1 Communication of organisation values</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14.2 Motivation of employees to work towards achieving H&amp;S goals</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14.3 Clarify to immediate employees the specific behaviours which are required and expected of them</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14.4 Allow employees to personalize their roles in preventing and eliminating hazards and risk</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14.5 Encourage employees to develop positive H&amp;S attitudes.</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14.6 Encourage input, actions and involvement by employees in the H&amp;S management process.</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14.7 Increase the employees’ (site and office-based) understanding of the H&amp;S outcomes associated with their decisions, behaviours, and actions.</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14.8 Enable employees to increase their knowledge of the specific ways in which hazards are managed, as well as their ability to apply and implement the actual HSE processes.</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14.9 Use various sources of information to gain feedback on the effectiveness of culture actions and other H&amp;S-related behaviours.</td>
<td>U</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

SECTION 10: PREVALENCE OF GAS FLARING ON SITE

15 On a scale of 1 (Minor) to 5 (Major), indicate the extent to which the following challenges are prevalent on site (Please note the ‘Unsure’ response).

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Unsure</th>
<th>Minor..................................Major</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>15.1</td>
<td>Gas flaring</td>
<td>U</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
<td>---</td>
</tr>
<tr>
<td>15.2</td>
<td>Oil spillage</td>
<td>U</td>
</tr>
<tr>
<td>15.3</td>
<td>Human errors</td>
<td>U</td>
</tr>
<tr>
<td>15.4</td>
<td>Machine failure</td>
<td>U</td>
</tr>
<tr>
<td>15.5</td>
<td>Natural disasters</td>
<td>U</td>
</tr>
<tr>
<td>15.6</td>
<td>Lack of HS&amp;E knowledge on the part of site workers</td>
<td>U</td>
</tr>
<tr>
<td>15.7</td>
<td>Lack of adequate HSE equipment / gear and apparel</td>
<td>U</td>
</tr>
</tbody>
</table>

**SECTION 11: FREQUENCY OF OIL SPILLAGE**

16 Do you experience oil spills on site *(Please note the ‘Unsure’ response)*?

<table>
<thead>
<tr>
<th>Unsure</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

17 On a scale of 1 *(Minor)* to 5 *(Major)*, indicate the extent to which the following action / occurrences contribute to oil spills on site *(Please note the ‘Unsure’ response)*.

<table>
<thead>
<tr>
<th>Action / Occurrences</th>
<th>Unsure</th>
<th>Minor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.1 Pipeline / flow line leakage</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>17.2 Pipe corrosion</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>17.3 Sabotage of oil pipelines</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>17.4 Poor maintenance</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>17.5 Material defects</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>17.6 Discharge from transporting vessels / Tanker accidents</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>17.7 Human error</td>
<td>U</td>
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<td>2</td>
<td>3</td>
<td>4</td>
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<td></td>
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<tr>
<td>17.8 Natural disaster</td>
<td>U</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
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<td>17.9 Oil bunkering activities</td>
<td>U</td>
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<td>2</td>
<td>3</td>
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</tbody>
</table>

18 On a scale of 1 *(Minor)* to 5 *(Major)*, please rate in your opinion which of the following most undermine safety performance on-site *(Please note the unsure option)*?

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Unsure</th>
<th>Minor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.1 Lack of skilled workers</td>
<td>U</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
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<tr>
<td>18.2 Inadequate safety training of workforce</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>18.3 Over-reliance on sub-contractors</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>18.4 Lack of skilled supervisors</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>18.5 Lack of time</td>
<td>U</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
SECTION 12: CORPORATE SOCIAL RESPONSIBILITY

19 On a scale of 1 (Not important) to 5 (Very important), please indicate the extent of importance of your organizations interaction with host communities relative to HSE (Please note the unsure option).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Unsure</th>
<th>Not important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.1 Host communities are treated as stakeholders during project design</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>stage</td>
<td></td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19.2 Encourage dialogue with host communities on issues relative to H&amp;S</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>/ environment and pollution at the production stage of a project</td>
<td></td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19.3 Demonstrate a strong conviction on HS&amp;E as it relates to host</td>
<td>U</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>communities</td>
<td></td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

20 Do you have any comments in general regarding HS&E management influences on organisation?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Thank you for your kind cooperation

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