Health and Safety Management in the Offshore Oil Industry

A project submitted to Middlesex University in partial fulfilment of the requirements for the degree of Doctor of Professional Studies.

Valerio De Rossi

MSc, Master Mariner, AFNI, MCMI

Institute for Work Based Learning

Middlesex University

September 2010

Abstract

This work-based project is an investigation of the interaction between multicultural crews and safety management systems and the influences of this interaction on health and safety in the offshore oil Industry. This study has been carried out in partial fulfilment of the requirements for the Doctorate of Professional Studies at the Institute of Work Based Learning, Middlesex University, London. The aim of this project is to minimise occupational casualties in the industry by exploring the social science paradigms of human action and cultural diversity, and it relies heavily on ethnographic methodologies. The qualitative data collection techniques chosen are structured observations, semi-structured interviews, focus groups and a research diary. The key themes that emerged from the project highlighted the perception of high consequences/low probability risk among the working community. In this context, the cultural relativity of the hazard perception is an instrument used to maintain group solidarity. The group that emerged from this work-based research is culturally-biased according to a 'way of life' that characterises it, and predisposes it to adopt a particular view of society at work. The data collected and analysed in this ethnographic investigation establish the fact that cultural bias and shared values have influenced how safety is lived and, most importantly, seen and perceived by the workforce community. The concept of "cross-cultural safety consciousness" is proposed in this research, along with a conceptual model for a practical approach to safety based on its findings, with the aim being to reduce the number of incidents in the offshore oil industry. The project may have an international impact and relevance; professional organisations and maritime trade unions have displayed interest in the outcomes of this investigation.

Table of Contents   **Page**

Appendices **Page**

Table of Figures   **Page**

List of Tables   **Page**

ACKNOWLEDGEMENTS

C H A P T E R 1

1.0 Introduction

This work-based project is an investigation of the interaction between multicultural crews and safety management systems and the influences of this interaction on health and safety in the offshore oil industry. It addresses the variability in perceptions of risk between and among different groups of seafarers. M. Douglas (1982) argues that Risk Perception is socially constructed and that this is often unrecognised in modern organisations with multicultural employees. These considerations are all the more topical and important given that, in 2007, for example, the offshore oil industry suffered five fatalities, 445 medical treatment cases and 277 restricted work incidents (IADC 2008). In 2008, the number of fatalities increased to nine, the medical treatment cases to 459 and the restricted work incidents to 279, with a total man-hours of 173,281,728[1] (IADC 2009). The 2009 statistics have yet to be published, however 2010 brought the tragic incident in the Gulf of Mexico, involving the explosion and subsequent sinking of the Dynamically Positioned MODU (Mobile Offshore Drilling Unit) "Deepwater Horizon", which caused the death of eleven crew members and probably the worst environmental pollution ever to have happened at sea.

The aim of this project is to look at how to minimise occupational casualties in the industry, by exploring the determinants of the work practices of multiethnic and multicultural crews working under the peculiar conditions of the offshore industry. To accomplish this strategic aim, I have used a number of social science paradigms of human action and cultural diversity, relying heavily on ethnographic methodologies to investigate the dynamics of Risk Perception. I explore safety structures and how these relate to behavioural patterns or professional practices, which in turn may be derived from shared or divergent approaches to seafaring workplace values about what constitutes safe practice. I investigate the 'structures' defined by laws, national legislation, company practice and ship practice, as well as individual behaviour patterns and the meanings or values attached to these and I look at the interaction of the human element, composed by the multi-cultural crews working on mobile offshore drilling units (MODU's) with the safety management systems. In other words, I will also be looking at the effects of 'agency'[2], that is, how disparate groups of seafarers involved in the offshore segment of the industry–who are living, breathing, professional individuals from different ethnicities and cultures-behave and what, if any, shared meanings they attach to `risk'.

Multinational crews in this industry are an irreversible trend. Kahveci *et al.* (2002) report that approximately 65 percent of the world's merchant fleet have adopted multinational crewing strategies and I feel that it is important to study how this interaction influences health and safety in this industry. The recent study of Bailey *et al.* (2007) proposes that nationality is the main predictor of the perceptions of each type of potential injury at sea. This study will investigate the proposition that crews working in a multicultural environment, as defined by Cultural Theory (Douglas 1982), have heterogeneous perceptions of risks and that this has possible impacts on health and safety behaviours. In addition, the fact that human factors account for between fifty and ninety percent of accidents at sea (Kuo 2007, Horck 2005, Thompson 2008, Sutherland *et al.* 2000) highlights the importance of this project. Every study reports an involvement of the human element at some point in the causal chain. The research I undertake is therefore based on a study of the crew of an ultra deep-water Mobile Drilling Unit (MODU), of which I am the Captain, engaged in oil and gas exploration worldwide. We have in the region of seventeen nationalities involved in a total crew of 172 persons.

Health and Safety is a key concern in today's working environment. Every industry is putting a lot of effort into making the workplace safer, for a variety of reasons. Big corporations face an ethical dilemma due to the fact that it is not acceptable in today's society to see employees, and hence members of the society, suffer accidents while working. Also, considerable national and international legislation has been passed since the Second World War, setting health and safety norms in an attempt to create an international 'safety regime', especially within the EU context, as is detailed later on in the chapter. I would add that endeavours to avoid incidents are also dictated by marketing reasons and, more pragmatically, by the costs involved in dealing with unfortunate events. A safe company is surely more "marketable" than competitors with poor safety records. Policy makers are constantly developing new rules and regulations, trying to create a framework within which workers are able to practice their trades in an incident-free environment. Globalisation has surely added another ingredient to the already complex issue; we are moving from the local village to a global, borderless market, and this has been crucial in creating a multicultural environment.

1.1 My Positionality vis-à-vis this Project

I am a practising Master Mariner working for the world's largest offshore drilling contractor. I am in command of ultra deepwater dynamically positioned drillships engaged in oil and gas exploration worldwide and have about twenty years of sea experience. My main function is to provide marine support to the industrial operation of the vessel, and I have the authority and discretion to take whatever action is required for the safety of the crew and the vessel and the protection of the environment.

To be more precise, I am responsible for the safety, security, stability, dynamic positioning, pollution prevention, regulatory compliance, marine operations and seaworthiness of the ship. I manage its continuous surveys and the renewal of statutory certificates, as required by the Classification Society and the statutory regulations. I also ensure compliance with environmental protection requirements, as specified by the company policies and regulatory bodies, and that the quality, health, safety and environmental policies and programmes are communicated to and understood by all personnel. I coordinate the weekly emergency drills and monitor and evaluate the crew responses; I am the Person in Charge (PIC) in the event of an emergency and I am accountable for managing any situation which may arise aboard the vessel. I play an active part in the weekly safety meetings, quality improvement programmes and safety management systems.

I graduated from the Nautical Technical Institute in Rome, Italy and from the Navy Reserve Officer's Course, at the Italian Naval Academy. Having completed the course and become a commissioned Navy Officer, I served for four and half years on different war ships, leaving the Italian Navy with an honourable discharge as Sub-Lieutenant. I then had a brief period of working on a container ship and later, in 1992, began working in the offshore oil industry. Here, I have achieved valuable experience in different operational environments, such as pipe laying, construction and drilling activities. I obtained the Master Mariner's certificate of competency in 1995. I have also specialised as a Dynamic Positioning Operator since 1997, and since then I have served on dynamically positioned vessels. I have been on worldwide assignments to regions such as West and South Africa, the North Sea, South and Central America, South Korea, Norway, Holland and the UK. These experiences enriched me, culturally, as I saw different countries and communities, and this sparked my interest in safety culture among diverse workforces.

This interest in maritime safety management has been enhanced academically through my studies for the Master of Science degree in Work Based Learning (Marine Operations and Safety Management) which I received from Middlesex University in 2004. My final

project was a case study based on a MODU, researching the risk assessment and accident hazards in this industry (De Rossi 2004). This widened my general knowledge about safety management in the offshore industry.

1.1.1 RAL claim at Level 8

Moreover, I have successfully claimed a recognition and accreditation of learning (RAL) at the doctoral level for obtaining 100 credits at level 8 for "Advanced developments in professional practice", in the "Marine Operations and Safety Management" area of learning. (Appendix R)

In the RAL claim, I demonstrated the use of interdisciplinary knowledge with a large amount of autonomy and responsibility for professional projects of a complex and high-level nature within my professional practice. I explained that I am well aware of my legal and ultimate responsibility and authority while exercising my professional practice, and that I have used my leadership in an appropriate manner. I also showed that the knowledge claimed is heterogeneous and not solely discipline-based, as it is characterised by shifting away from cognitive and discipline-based fundamental principles, towards contextualised results. Thus, it is clearly trans-disciplinary, embracing science and technology as well as social science.

In the claim, I also illustrated that in my professional life I have used my knowledge, skill and experience to make executive decisions with financial and operational impacts. I explored the safety management of my profession, including a description of how I was able to manage an emergency situation in an efficient and professional way. This is defined by Schön (1987) as "*artistry",* meaning the competence a practitioner uses in an indeterminate zone of practice, in trying to fill the gap left by the professional curriculum.

To summarise, I pointed out that my practice is very dynamic, and I systematically use my professional knowledge in order to achieve a clear objective, which is a safe and efficient operation, and this in turn generates a profit for my company. The emphasis of the RAL was, in fact, to reflect upon and analyse an essential part of my practice, which is the safety management of offshore operations. Because of this emphasis, I consider my RAL claim at the doctoral level to be a solid springboard for this project, in which I have focused my efforts on a particular aspect of the wider range of practices I have been engaged in during my professional career, that is, to achieve the safest possible working environment for my fellow professionals in the offshore industry.

1.2 Work-Based Context

A paradigm worth mentioning is the work-based nature of this research; the Institute for Work Based Learning has developed an innovative approach to personalised learning for full-time professionals who are also, in the research context, practitioner researchers. In fact, the stakeholders–defined as the University, the doctoral candidate and a representative of the professional practice–sign a formal learning agreement.

This aspect was highlighted several times in various pieces of feedback received at the research proposal stage, such as that from a former colleague, who stated: "*It is nice to see that there are some hands-on people around who can competently talk about the industry and not only "desk captains". Industry really needs this*" (3)

As this project was carried out under the umbrella of the work-based learning paradigm (Armsby 2000), it was able to generate, among professionals and organisations, knowledge that is defined by Gibbons *et al.* (1994) as 'Mode 2'. This differs from the discipline-based 'Mode 1' which is investigator-initiated and likely to be produced within academia.

Gibbons also argues that this mode of knowledge has become the main method of production of subject disciplinary research in universities. The alternative, Mode 2 knowledge, is subject to the quality control of market acceptability, as well as peer reviews, in order to achieve its 'validity'. It is created in broader and trans-disciplinary social and economic contexts on the basis of real world projects and problem solving. However, I can see the paradox involved in moving from Mode 2 to Mode 1 knowledge, having put the former within an academic framework and perhaps twisted it into Mode 1, while looking for 'academic validation'. I am not arguing that Mode 1 knowledge is not important; traditional academia is still relevant for building skills and competence in professions, and providing their knowledge base, and thus has a legitimate role. However, Heath (2001) argues that '*in this knowledge rich age schools cannot continue to be the exclusive or even necessarily the primary sites of learning*'. Schön (1983) states that universities are committed, for most part, "*to a particular epistemology, a view of knowledge that fosters selective inattention to practical competence and professional artistry*". In fact, new knowledge is nowadays produced by professionals and practitioners, and this project has entered, in its own right, into this classification.

1.3 The Offshore Industry

The offshore oil industry, like all industries, is constantly putting effort into making its operations safer. Big corporate interests are involved and safety records are now carefully scrutinised in order to remain competitive in the fiercely contested energy market. A big corporation cannot afford incidents and accidents for the reasons mentioned earlier. Its performance is measured in safety terms as well as other values, because there is no successful operation if it is not also safe and incident-free. This work-based project has focused on exploring the health and safety issues of the offshore oil industry, more precisely in the field of the upstream oil sector or exploration and production (E&P). This is the very sector where the energy operators develop oil and gas drilling exploration campaigns worldwide. In this sector, technology is paramount, exploration is moving into deeper and deeper water,[4] and what was a wild dream a decade ago is now the norm. Thus, equipment and crews are working at the cutting edge of know-how. Mobile Offshore Drilling Units (MODUs) are exploring hundreds of miles off the continental shelf.

The world fleet is expanding year after year in the search for new energy supplies for the ever-growing world needs, due in part to rapid industrialisation in the emerging markets. Globalisation has radically affected this industry. The very nature of the worldwide explorations has helped increase the flexibility of the global human resources market, and over the years this has created a multicultural community, bound by the expertise in the oil and gas industry. [5]

The thought of loss of life during the execution of one's profession is unbearable in today's society. In my opinion, this problem deserves a thorough effort and I for one want to contribute towards a safer workplace. The high numbers of incidents and accidents suggest that something must be done to drastically reduce these figures. Tackling the problem from a different prospective may shed some light on this very complex and multi-layered matter. The different perspectives mentioned earlier will enable me to take stances on the issue from various cultural points of view and perhaps from a more interpretivist-oriented perspective. In fact, many studies on health and safety have been carried out in the past that have focused on more positivist-inclined behavioural psychology (see, for example, the work of Stranks 2007, Shuterland *et al.* 2000, Cooper 1999 and 2002) rather than on more culturally-informed approaches to meanings and shared meanings. The latter is where I intend to place the emphasis in this project.

15

1.4 The Mobile Offshore Drilling Unit (MODU)

By definition, a MODU is a vessel capable of engaging in drilling operations to explore for or exploit resources beneath the sea-bed, such as liquid or gaseous hydrocarbons, sulphur or salt (IMO MODU Code, p.3). Under the generic MODU description, a self-propelled unit is defined as a unit certified to navigate independently and a drillship is a self-propelled ship-shaped monohull surface MODU (IMO Res. A891(21)).

The MODU drillship is therefore a large ship equipped with a drilling system and a derrick located on the middle of its deck. In addition, a drillship has a so-called 'moonpool' on its deck, which is an opening in the hull that permits the drill pipes, lowered from the derrick, to reach the bottom of the ocean and drill the seabed.

The offshore installation manager (OIM) is the competent person appointed in writing by the owner as the person in charge (PIC) of the MODU. He/she has complete and ultimate command of the unit and all personnel on board are answerable to him/her. On a self-propelled unit, the ship's captain or Master is generally appointed by the company as the OIM. This is usually the case because all maritime crew members on self-propelled mobile offshore units and, where required, on other units, should meet the requirements of the international convention on standards of training, certification and watchkeeping for seafarers, as amended (IMO STCW Code). The maritime crew comprises the OIM, the barge supervisor, the ballast control operator and the maintenance supervisor as well as other deck and engineer officers, radio operators, and ratings, as defined in regulation I/1 of the STCW Convention, as amended (IMO Res. A891(21)).

A MODU is organised into different departments; usually, it is composed of the drilling department headed by a Toolpusher, the maintenance or technical department headed by a Maintenance Supervisor or Chief Engineer, the deck department headed by the Chief Mate or Stability Section Leader, and the catering department headed by a chief steward: they all report to the OIM. The drilling department deals with all of the drilling-related operations, including picking up pipes and casings on the derrick and using them to drill the seabed, and operating all of the related drilling systems and equipment. The maintenance or technical department is responsible for power generation and propulsion and the maintenance of all the electrical, hydraulic and mechanical equipment on the MODU. The deck or marine department is broadly responsible for the navigation and positioning of the MODU, its stability, the lifesaving and fire fighting equipment and ship-to-ship operation, including offloading cargo and fluids from supply vessels. The latter are vessels used to supply the MODUs with equipment and food provisions. The catering

department is responsible for the food preparation and general housekeeping and cleaning of the accommodation quarters, which includes cabins and offices. Usually, there is also a client representative on board, and often third-party engineers and technicians specialised in specific drilling tasks, such as drilling fluid control, remotely-operated vehicle operations, and geological data acquisition.
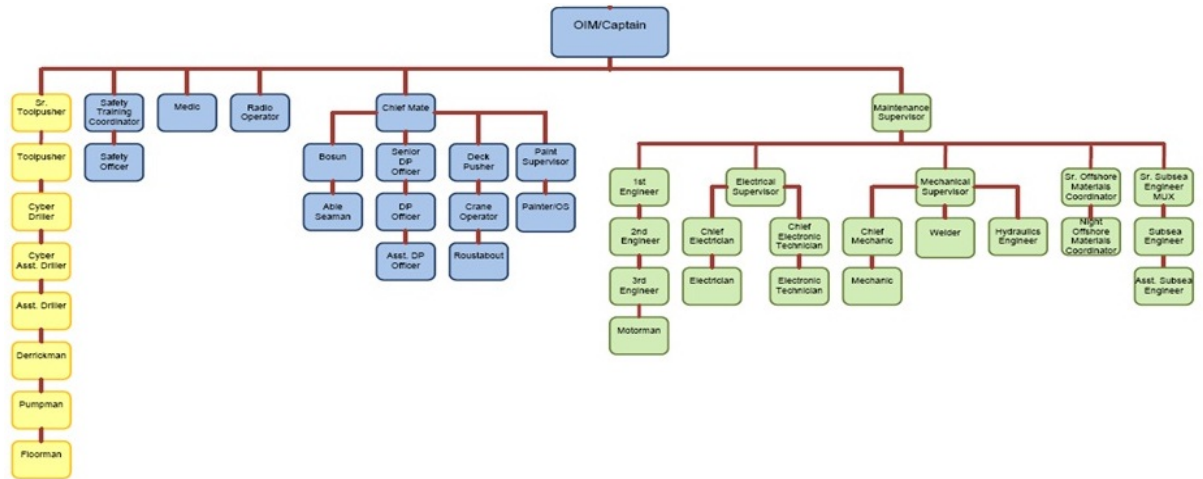
Figure 1.a: Typical MODU – Drillship organisation

The crews usually spend a period of 28 days on board alternated with 28 days of rest ashore. During the period on board the MODU, the crews are divided into night and day shifts of twelve hours. At the end of each period on board, each individual will have worked for a total of at least 336 hours, without a single day off. The operations therefore never stop; the day shift is followed by the night shift and, in this way, drilling activity is continuously ongoing. Working life aboard a MODU is thus quite concentrated. Most of the crewmembers are exposed to intense manual labour for prolonged periods of time. In their twelve hours off duty, they have the use of recreation rooms, where it is possible to engage in social activities and watch television programmes.

The latest generation of MODUs are chartered worldwide by the oil majors for day rates of over 500,000 USD and, in the event of an unplanned halt in the drilling operations, for any unforeseen reason, a percentage of the rate is deducted. The urgency of the operational performance is therefore often dictated by the commercial pressure on the crews to avoid a non-productive time and thus a financial penalty commensurate to the time lost. This commercial pressure, if not dealt with and filtered by the MODUs management, may easily induce the crews into non-compliance with the safety regime, which may well result in incidents and accidents. It must also be borne in mind that every operation on a MODU is strictly recorded and then scrutinised by the client. Because of the high day rates, the charterer of the MODU is expecting a high performance and this may induce pressure on

the crew to perform over and above the contractual requirements. The department most exposed to this commercial pressure is surely the drilling department, which carries out the core of the MODU's operations. If the drilling operations stop, the MODU is then in non-productive mode, whilst if the problem is on the maintenance or marine side this may not result in a commercial penalty due to the high redundancy of the systems on board modern units.

1.5 Rules and Regulations

In this industry, safety management systems are comprehensive and virtually every operation is carefully planned and thought through beforehand. Unfortunately, despite this planning, incidents and accidents still happen, as the statistics I present in this project dramatically show.

There are international regulations that lay down rules about how to manage safety at sea, enforced through the United Nations' International Maritime Organisation (IMO). The Safety of Life at Sea Convention (SOLAS '74) is the most important treaty protecting the safety of mariners. In recent years, all maritime nations have made a synergic effort with the intention of making the ships safer and the seas cleaner and, in July 1998, through a process of tacit acceptance, the SOLAS Convention was amended with a new Chapter IX, entitled the 'International Management Code for the Safety of Ships and Pollution Prevention', otherwise known as the ISM Code. This effort to improve the safety at sea was made in the light of major incidents that happened in the late 1980s and early 1990s, such as the capsize with consequent loss of life of the passenger ferry "The Herald of Free Enterprise" in 1987, the huge amount of oil pollution from the tanker "Exxon Valdez" off the coast of Alaska in 1989, a fire on the cruise ship "Scandinavian Star" in 1990 which caused extensive loss of life, the tanker "Braer" which was driven onto the Shetland Islands in 1990 causing major pollution, the sinking of the ferry "Estonia" in the Baltic Sea in 1993 with dramatic loss of life and another major oil spill from the "Sea Express" in Milford Haven in 1996.

In brief, the ISM Code is a set of guidelines on how to develop, implement and monitor a safety management system to ensure the safe operation of ships and pollution prevention.

The biggest incident in the offshore oil industry was undoubtedly the "Piper Alpha" disaster. "Piper Alpha" was a platform exploiting a reservoir about 110 miles northeast of Aberdeen, extracting and separating a mixture of oil, gas and water. On the 6th of July

1988 an explosion followed by a series of smaller explosions and fires caused 167 fatalities. The UK Government ordered a public inquiry under the chairmanship of Lord Cullen, the finding of which were published in November 1990 (Cullen 1990), a total of 106 recommendations were made, all accepted by the Government. The most significant is surely the concept of the "Safety Case", in which an operator of offshore installations is required to submit to the regulatory body a safety management system specifying the preventive measures taken and the mitigating measures for reducing the effects of a major incident if one does occur. Auditing of the operators' safety management systems was another of Lord Cullen's recommendations, as well as the system of "permit to work", which is a set of procedures that must be followed before the "go-ahead" is given for any activity carried out on the installation. Evacuation, escape and rescue must also be planned for and the plans submitted to regulatory bodies; in brief, a set of rules where lay down to regulate the offshore oil activities.

1.6 Significance of the Work Based Project

I believe that investigating the interaction between the human element, composed of the multicultural crews working on MODUs, and the safety management system and its influences on health and safety will be beneficial for the offshore oil industry. The research outlined in this work-based project has clear implications for practice, and integrates national cultures with communities of practice within a health and safety context.

This project not only provides a different perspective on dealing with the concept of safety, but also develops the literature on and for a specific professional community of practice (Wenger *et al.* 2002), formed by multicultural human resources engaged in a process of collective learning in a shared domain of human endeavour. Cultural awareness in this globalised world should not simply recommended, it should be mandatory, and hopefully the IMO and offshore regulatory bodies will acknowledge this need and set a framework for developing training courses for practising seafarers and offshore oil workers.

Footnotes:

1) A man-hour is the amount of work performed by a worker in one hour.

2) For Giddens, structures are rules and resources (sets of transformation relations) organised as properties of social systems. Rules are patterns people may follow in social life. Resources relate to what is created by human action; they are not given by nature. Rules and resources that govern and are available to agents, constitute 'structure'. Agency, as defined by Giddens, is human action. Agents' knowledge of their society informs their actions, which reproduce social structures, which in turn enforce and maintain the dynamics of action. (Giddens, 1986)

3) Author's personal correspondence

4) In 2000, the ship I was serving on, the "Deepwater Expedition", set the world water-depth record, for drilling in 9,144 feet of water. Later the same year, the "Deepwater Millennium" broke the record in 9,200 feet of water. In 2001, the "Discoverer Spirit" twice broke the record, in 9,687 feet and 9,727 feet of water respectively. In 2003, the "Discoverer Deep Seas" set the current world record, becoming the first rig in the industry to drill in more than 10,000 feet of water, in 10,011 feet to be precise.

5) What I understand by globalisation is the process by which regional economies, societies, and cultures have become integrated through a global network of communication, transportation and trade. (Friedman 2005)

C H A P T E R   2

RESEARCH AIM AND OBJECTIVES, TERMS OF REFERENCE, RESEARCH STATEMENT AND QUESTIONS

2.0 Introduction

In the first part of this chapter, I will state the aim and objectives of this work-based research. I will then explore the terms of reference, with particular emphasis on culture, organisational culture and, an important aspect of the latter, safety culture. From there I will contextualise the safety management concepts used in the offshore oil industry. I will then explain how and why I use Mary Douglas's (1982) Cultural Theory, applied to organisations, to comprehensively assess "workplace culture". I will also explore the literature about the use of Cultural Theory for empirical research and about its value in defining risk perceptions among different cultural groups, based on the assumption that the perception of the risks is socially constructed.

In the second and last part of the chapter I propose the research statement and research questions, supported by the theoretical and conceptual framework.

2.1 Aim and Objectives of the Research

The aim of this work-based project is to investigate methods and practices for minimizing occupational casualties in the offshore industry by exploring the social science paradigms of human action and taking into account the complexities involved in crews with cultural diversity. The project relies heavily on ethnographic methodologies as participant observer. It addresses the variability in perceptions of risk between and among different groups. Mary Douglas (1982) affirms that 'risk perception' is socially constructed. This is often unrecognised in modern organisations with multicultural workforces.

The objective of this research is to investigate the interaction between multicultural crews and safety management systems and the influence that this has on health and safety in the offshore oil industry, based on the socially constructed and individual perceptions of risks. The research therefore focuses on a multicultural environment, as defined by Cultural Theory (Douglas 1982). This theory proposes that risk perception is created by culture rather than individual psychology, as an explanation for differences in risk

judgments, and it indicates the existence of an individualistic, egalitarian, hierarchist and fatalistic 'way of life'. Risk perception is the subjective judgment that people make about the characteristics and severity of a risk, which is defined as the probability of harm occurring.

The first questions should be: Is there a problem in the industry? And what are we going to investigate?

Despite the set of rules and regulations, detailed in Chapter 1, which regulate the health and safety in the industry, my interest in exploring occupational casualties is based on the number of incidents and accidents that are still taking place. In 2007, the drilling offshore drilling industry has suffered experienced five fatalities, 445 medical treatment cases and 277 restricted work incidents. (IADC 2008).

In 2008 the numbers of fatalities increased to nine, the medical treatment cases to 459 e the restricted work incidents to 279. (IADC 2009)

As I mentioned earlier, people losing their lives while carrying out their profession is increasingly unacceptable in today's society, and I believe that a lack of cultural awareness plays a role in this contest. Many studies on health and safety have been carried out in the past, which have focused on psychology (see, for example, the work of Stranks 2007, Shuterland *et al.* 2000, Cooper 1999 and 2002) rather than on multicultural diversity. The latter is the topic I have investigated in this research.

My professional experience has suggested to me that there is a lack of cultural awareness and continuing fallacious stereotyping among multicultural crews. These kinds of crews are an irreversible trend, and I believe that the changing nature of the globalised skilled and unskilled workforce employed in the industry requires this research. In addition, I aim to add considerably to the literature on maritime health and safety.

On this note, the IMO, the United Nations agency concerned with the safety of shipping and cleaner oceans, has already addressed the importance of the human element. All new regulatory proposals have to be scrutinised by a sub-committee to ensure they are compatible with the human ability to comply with them (IMO 2003).

My main points of focus in this project are as follows:

- ➢ find out qualitatively how the multicultural workforce understands the 'safety system';

- ➢ qualitatively classify the Risk Behaviour Types;

- classify the risk perceptions of the multicultural workforce

- Match the empirical findings concerning the multicultural workforce's understanding of the 'safety system' and the Safety Vision's understanding of these concepts;

- look at the special case of the drilling industry–its special needs and current condition; and

- address issues arising from the different health and safety 'regimes' through empirical research.

2.2 Terms of Reference

This part of the chapter explores the literatures pertinent to the multicultural context of this work-based research. The concepts of culture, culture in organisations, safety culture, safety management, multiculturalism, cultural theory in analysing work organisations and their applications are investigated.

2.2.1 Definition of Culture and its Use in Organisational Research

Culture is a concept that has been defined in many ways. The etymology of the word derives from the Latin *cultura,* stemming from *colere*, which means "to cultivate". From this etymological standpoint, it is clear that culture is a dynamic concept, which can take different shapes and meanings. In broader terms, culture has been defined as a "*way of life"*. For instance, when we refer to the "American culture" or the "Japanese culture", these shorthand terms implicitly suggest a particular perception of the world and hence a way of life. Margaret Mead (1937, quoted in Monaghan & Just 2000) defines the difference between *the* culture and *a* culture. The former is traditional behaviour, which has been developed by the human race and learned by each generation. *A* culture is instead, according to Mead, less precise. It can refer to a given society, or group of societies, or a certain race or area, or to a certain period of time. Thompson & Wildavsky (1990) define the "way of life" as a combination of cultural bias and social relations, the former refers to shared values and beliefs, and the latter denotes a pattern of interpersonal relations.

Another early definition of culture by the English anthropologist Edward Tylor (1832-1917, quoted in Monagham & Just 2000) is the *"accumulation of human accomplishment"*. Later the famous German-American anthropologist, Franz Boas (1858-1942), described this value as a set of cultural glass lenses that provide us with a means of perceiving the world around us. This is a very powerful definition, which I founded very useful for understanding modern organisations. Schein (2004:7) reports that, in order to make sense of situations biased by our own assumptions, it is necessary to take a cultural perspective, and learn to see the world through a *"cultural lens"*. This echoes the concept expressed by Boas at the early stage of the social anthropologic studies. Again, Hofstede (2005) reports that "*everybody looks at the world from behind a windows of a cultural home*" (p.363).

Hofstede (2005:3) points out that "culture" in most Western languages means civilization or "refinement of the mind" and that the results of such refinement include education, art and literature. However, according to Douglas (1990), cultural stability, especially in the Western world, is short-lived, as homogeneity is achieved with difficulty and is always on the brink of dissolution. In short, she claims that "the culture is nothing if not a collective product" (1992:125).

Schein (2004:7) testifies that managers often speak of developing "the right kind of culture". This suggests that the word "culture" is used in a superficial and perhaps incorrect way, with the assumption being that there are "good" and "bad" cultures. In reality, culture for a group is what personality or character is for an individual. The way we see people is mainly through their personality traits and behaviour. The former can be broadly defined as what a person *is*, the latter as what a person *does.* This concept is also true for a culture. In fact, we can observe the behaviour of the group in a particular culture, but very often we cannot see what really constrains it, which is what matters the most.

In a complex society, individuals belong to many different organisations and, therefore, a given cultural unit is, in reality, a complex set of overlapping subcultures (Schein 2004:119). Just one of the models that we always bring to any new group situation is the model of our own family, which is the group in which we spend most of our early life. Hofstede & Hofstede (2005) suggests that, in a broader sense, culture is a "mental software", arguing that it is "the collective programming of the mind that distinguishes the member of one group or category of people from others" (p.4).

2.2.2 Organisational Culture

The concept of organisational culture has been studied extensively in the last two decades, and it is widely acknowledged that this concept is a critical determinant of an organisation's success or failure. Schein (2004) suggests that it is easy to observe what happens in an organisation, for example leadership failures, poor marketing and so on but, in the effort to understand *why* such things happen, "culture as a concept comes into its own" (p.xi).

Many definitions are suggested for organisational culture, for example Hofstede & Hofstede (2005) call it "the collective programming of the mind that distinguishes the member of one organisation from another" (p.402)

Glendon & Stanton (2000) describe two broad perspectives of organisational culture, which they call functionalist and interpretative. The former is applicable to an organisation which has a culture to support a set of strategies and systems dictated by management, primarily goals and visions. It is a 'top down' perspective, where leaders try, and often fail, to initiate a culture, for example through the rigorous adoption of formalised risk management practices (Kuo 2007) or by simply dictating a set of rules and regulations. The interpretative approach is instead a 'bottom up' approach, as it allows for the existence of sub-cultures within an organisation, which are a pattern of basic assumptions that an organisation has developed over a period of time to cope with its problems, and then taught to new members (Schein 2004).

Glendon & Stanton (2000) also note that most organisations display elements of both approaches, for example using the interpretative mode to analyse mistakes from the past–the so-called "lesson learned" process–along with a functionalist approach in terms of formal methods of hazard identification and risk assessment. Douglas (1992) does not view this concept as "static" but, on the contrary, as a way of life created continuously by everyone involved in the organisation. In other words, it is the result of the daily activity, conversations and negotiations between members of the organisation.

Hendry (1999a) highlights that despite the substantial attention devoted by management and scholars to organisational culture, there have still been few attempts to bring cultural theories of social anthropology into the management arena.

Through the organisational culture framework, it is possible to understand how values, attitudes and beliefs about safety are expressed and how these influence the direction taken by the organisation. As articulated in Chapter 1, the disaster involving the Piper

Alpha platform (Cullen,1990), dramatically highlighted the importance of these values and led to the term 'safety culture' arising in its own right in the offshore industry. The issue also became of general concern after the disaster involving a nuclear power station in Chernobyl, in 1986.

2.2.3 Safety Culture

In the context of this project, it is important to clearly define what is meant by "*maritime safety culture*", as it is a recurrent theme in the research. The definition used here is "a belief, philosophy or faith held by groups or individuals on safety matters which is demonstrated in practice through the attitudes, actions and behaviour adopted by the people of an organisation or a nation" (Kuo 2007)

Lützhöft (2004) suggests that trying to fix "human error" by incremental improvements in technology or procedures tends to be largely ineffective due to the adoptive compensation of the user. In fact, many organisations, in an endeavour to improve workplace safety performance, have recently moved away from a focus on engineering and ergonomic physical design and its relationship with employee performance, towards a focus on safety climate and/or organisational culture analysis. (Sutherland *et al.* 2000)

Rousseau's (1988) study added considerable knowledge to the safety literature. His review of the notion of a safety culture is underpinned by the concept of a group phenomenon, an expression of held norms consisting of shared beliefs and values.

It is also worth noting that the IMO Secretary-General E. E. Mitropoulos has stated that "safety is not an absolute concept and the levels chosen are based on shared values" (quoted from the foreword in Kuo 2007). The concept expressed by the Secretary-General refers to the same shared values already identified as a cultural bias in determining a specific "way of life" (Thompson & Wildavsky 1990).

Kuo (2007) reports that there is no obvious answer to the question "what is safety?" as there are no absolute items that can give a clear definition. This is because individuals have different perceptions of what is "safe" and what is "unsafe". Kuo's definition captures the idea that it is the individual perception that determines the concept "safe": "safety is a human perceived quality that determines to what event the management, engineering and operation of a system is free of danger to life, property and the environment" (2007:274).

As mentioned in Chapter 1, the research of Bailey et al. (2007) suggests that nationality is the main predictor of perceptions of each type of potential injury at sea. The study also demonstrated that different groups have relative perceptions for each type of injury at sea, however it does not indicate which nationalities have the most accurate perceptions of risk. Douglas (1982) affirms that risk perception is socially constructed. Perhaps it is now time to bring into the organisational management arena the concept of cultural theories (Hendry 1999a) with particular emphasis on the safety aspect, and this is the objective of this research.

2.2.4 Safety Management in the Offshore Oil Industry

The terrible wake-up call of the Piper Alpha disaster dictated that a different approach to safety was needed. Traditional safety management systems placed responsibility for safety on managers and often to a 'safety committee'. The former could not be omnipresent to prevent incidents or accidents happening and the latter had little or no authority at all. Most importantly, these approaches placed the responsibility for safety on somebody else, rather than on the workforce itself, making them feel that they were not accountable for their actions (Sutherland *et al.* 2000). Based on the Piper Alpha investigation, the major implementation required by the Cullen report (1990) was the adoption of a *Safety Case* by owners of offshore installations associated with hydrocarbon activities in the UK Continental Shelf. (Offshore Installation-Safety Case-Regulation, 2005)

The brief idea is that the owner must ensure that management systems are in place to address health and safety issues, including methods for reducing risk levels for the major hazards and controlling them effectively.

Kuo (2007) suggests a fresh approach to the Safety Management System, called the Generic Management System (GMS), which consists of two interlinked parts-the Management System and the Process Scheme-as represented in Figure 1.
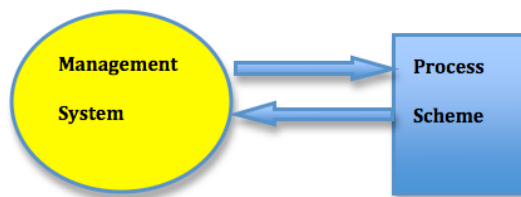
Fig.1 Basic GMS adapted from Kuo (2007)

The Management System comprises five elements, as follows:

1. Define → The objective and performance criteria, which set the goals

2. Organise → The resources and execution plan, to ensure the goals can be met

3. Implement → The plan in practice, via a <u>process scheme</u>

4. Measure → The results

5. Review → Lessons learnt during feedback

The Process Scheme is the interface with the implementation stage of the Management System, and consists of four generic steps:

1. Hazard identification

2. Risk assessment

3. Risk reduction or mitigation

4. Emergency preparedness
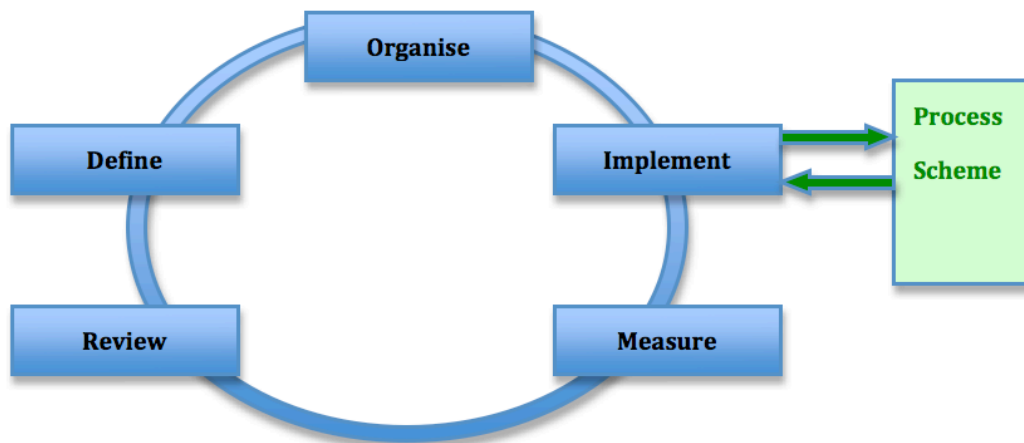
Fig.2 Representation of the GMS for safety approach adapted from Kuo (2007)

It is evidently necessary to identify a hazard in order to first assess and then mitigate the risk, but often the terms risk and hazard are confused with each other. I therefore define a hazard as a situation with the potential to lead to harm, and the risk as the probability of harm being realised.

There are several methods used in the industry to identify hazards, the most common being "hazard hunts" performed by skilled personnel prior to performing a task, with prompt cards suggesting different types of hazards such as engineering, energy, housekeeping, etc.

Once the hazard has been identified, we need to assess the risk, which is the probability of harm being realised. Risk assessment is a formal process of increasing the understanding of the risk associated with an activity. The process of risk assessment includes answering three questions:

1 What can go wrong?

2 How likely is this to happen?

3 What are the impacts if it does?

Qualitative answers to these questions are often sufficient for making good decisions about the allocation of resources for safety improvements but this does require a wealth of `qualitative' knowledge and information.

As a second means of analysis, quantitative methods generally involve modelling consequences and analysing the probability of occurrence. Often the two methods are combined to determine the risk.

It is sometimes argued that in order to work in an incident free working environment, the need is to reduce the risk to zero. This is the so-called "zero risks" philosophy (Viscusi, 1996). At its extreme, this approach could lead towards the consequence of ceasing the work completely, with the operation loosing all its benefits.

According to Ball (2000), there are eight different concepts of safety, from the politically inspired zero risk type, to scientific methods such as risk factors, and finally pragmatic methods such as risk tolerability. Every approach has different strengths and weaknesses and each is affiliated predominantly to a specific profession, but those in use in the major industries are the pragmatic ones (De Rossi, 2004).

The UK Offshore Safety Act 1992 transferred responsibility for offshore health and safety to the Health and Safety Commission and Health and Safety Executive (HSE) and brought the regulation of offshore safety (on the UK Continental Shelf) within the compass of the Health and Safety at Work etc. Act 1974 (HSWA). The Offshore Safety Act extends the application of Part I of the HSWA. This includes "securing the safety, health and welfare of persons on offshore installations".

The HSWA sets out the general responsibilities that employers have towards employees and members of the public, and that the employees have towards themselves and each other. These duties are qualified in the Act by the principle of 'so far as is reasonably practicable'. In other words, the degree of hazard in a particular job or workplace needs to be balanced against the time, trouble, cost and physical difficulty of taking measures to

avoid or reduce the risk. This is a pragmatic approach, generally used in the Offshore Industry and referred to by the acronym ALARP (As Low As Reasonably Practicable).

Once the risk has been assessed based on the estimated consequence (C) and probability of occurrence (P), either through qualitative or quantitative methods, the next step is to reduce the consequences or the probability or both if the risk level is in the 'intolerable' region.

The final step in the Process Scheme is to prepare actions that should be taken in the event that a hazard becomes a reality, in order to minimise the effects. Plans are developed to deal with specific situations, based on data gathered through simulations and practical exercises.

2.2.5 Multiculturalism

Multiculturalism has been used in recent times as an umbrella term to characterise the moral and political claims of a wide range of disadvantaged and diverse groups, and it has been used around the world as a concept relating to ethnic mobilisation and to improve justice and equity (Rex and Drury 1994).

Taylor (1994) provides a philosophical argument for the human need to be recognised for one's distinctness, especially cultural distinctness. In his argument, he defends the rights of minority cultures to receive equivalent evaluations of their significance to global history.

The concept of multiculturalism reflects the importance that culture plays in structuring our society and the relationships between its members. However different groups may not belong to a single `homogenous' entity called the `nation-state' or a geographical territory may contain a multiplicity of ethnic, linguistic or religious social entities. In states or territories with a heterogeneous population, there is a tendency for ethnic, linguistic and religious groups to fight for recognition of their own identities in the political arena or in the sharing out of economic resources. (Hofstede & Hostede 2005). In actual fact, a culture consists of the beliefs, values, behaviours and other characteristics common to the members of a particular group or society or, to use Douglas's words, "the culture is nothing if not a collective product" (1992:125)

It is mainly through culture that groups define themselves in relation to society's shared values. Society is taken to mean a group of people who interact in such a way as to share a common culture. It must be noted, however, that a society does not always correspond

to a nation, a concept that was introduced following the colonial period of the mid-twentieth century. Hofstede & Hofstede (2005) write that:

"The invention of nations, political units into which the entire world is divided and to one of which every human being is supposed to belong–as manifested by her or his passport–is a recent phenomenon in human history." (p.18)

To see how a society does not necessarily correspond to a nation, we can think of the different groups that formed the former Yugoslavia. As the Balkan war dramatically showed, the different ethnic 'societies' there did not share the same concept of their nation.

Blum (1998), however, describes how the character of the groups that we think of as "cultures" in a multiculturalism context, are intimately bound up with racial history. This aspect lays the grounds for a particularly intimate connection between culture and race, within the ethical foundation of multiculturalism.

It is also true, on the other hand, that nationality is often the only feasible criterion that can be used for cultural classification, although it should be used with care for the aforementioned reasons. In the context of this project, separating people into different nationalities is just one indication of the different groups that exist, and shows just one level of the different layers that make up any given culture. The different nationalities involved in this research challenge a single cultural hegemony.

Kahveci *et al.* (2002) report that approximately 65 percent of the world's merchant fleet has adopted a multinational crewing strategy. A study by Ellis & Sampson (2003) suggested that multinational crews dominate the global workforce of seafarers, with the top ten labour-supplying countries all being represented, although new nations such as Myanmar were also found amongst the labour force.

Tiryakian (2003) writes:

"I begin by the assertion that the term 'multicultural' is an empirical demographic condition referring to a society (which may or may not be a nation-state but may also include an empire) having two or more ethnic groups, each having cultural traits that may have some overlap with the other group(s), yet is distinctive enough to form a different cultural identity and community." (p.23)

These new emerging communities provide the context in which the meanings of objects and events are constructed and renegotiated. It is important to highlight that communities

of practice are crucially distinct from the institutions in the context of which they arise. As a matter of fact, they are often at odds with the institutions in important ways.

In the context of this project, the term of multiculturalism refers to a multicultural environment as defined by Cultural Theory (Douglas 1982). As mentioned earlier, Thompson & Wildavsky (1990) define the "way of life" as a combination of cultural bias, defined as shared values and beliefs, and social relations.

The respondents of this research will be immersed in a multicultural context where shared values and social constrictions could differ among the different sub-cultures involved, as could the perceptions of the risks.

M. Douglas's version of Cultural Theory addresses cultural differences, and as mentioned in Chapter 1, the globalisation, migration and general cultural diversity has resulted in a need to understand multicultural relations and this is true of the oil and gas industry as well. As I pointed out earlier, the very nature of worldwide explorations has increased the flexibility of the global human resources market, creating *de facto* a multicultural community bound by the expertise in the oil and gas industry.

To clearly identify the human element that will be used in the context of this project, I will use Kuo's (2007) definition of "human factors", which is as follows:

*"*Human Factors is concerned with the interfacing of a set of personal capabilities and characteristics with a combination of hardware, software, working environment and organizational culture in the effective performance at work" (p.174)

To comprehensively assess organisational culture, or an aspect of it such as safety culture, we must start with an adequate model of culture. I propose using Cultural Theory (alternatively known as Grid/Group Theory, Douglas 1982; Thompson *et al.* 1992), which is a two-dimensional framework of cultural comparisons.

2.2.6 Cultural Theory

The British anthropologist Mary Douglas (1921-2007) was the social scientist who introduced Cultural Theory (CT), it was then further developed by Michael Thompson and Aaron Wildavsky (1990).

Douglas (2005) explains that social sciences are usually able to honour the principle of "*ceteris paribus*" ('other things being equal'), which may be applicable in the late industrial society. Douglas's argument instead concentrates on anthropological comparison, for example that of ancient forms of worship, such as the belief in witchcraft. In such situations, cultural differences are often so diverse that any comparison would be impossible. Initially, Douglas tried to elaborate a theory applicable to any culture, based on the idea that all humans would have the same reaction to dirt (Douglas 1966), preferring regularity over disorder. This initial theory was however rejected by the sociologist Basil Bernstein (1924 – 2000), who argued that any theory should allow for different reactions (Douglas 2005), and that something could be appealing to some people, such as contact with snails or serpents, but disgusting to others. Douglas (1994) suggests that the idea of eating human flesh may be absolutely revolting to us but at the same time we know that cannibals practise this ritual.

Reflecting on Bernstein's arguments and critiques, Douglas then matured her original concepts into a theory initially called Grid and Group, which was designed to trace the distribution of values in a cultural framework. *Grid* refers to the degree to which individuals' choices are circumscribed by their position in society. *Group* refers to the degree of solidarity among members of the society, and the personal control exercised by members over each other. These dimensions were based on the work of the classical sociologist, Emile Durkheim, also admired by Bernstein.

Douglas (2005) explains how the Grid/Group analysis changed as a result of the input of Thompson and Wildavsky (1990), into a dynamic theory focusing on three assumptions. Firstly, it was understood that every kind of society comprises all four cultures at a social organisation level; secondly, at a cultural level, each of the four cultures are self-defined and in opposition to the others; finally, highlighting the cultural dynamics, it was assumed that the relation between cultures in a given society is a catalyst for conflict.

Moreover, Douglas points out that "Cultural Theory starts by assuming that a culture is a system of persons holding one another mutually accountable" (1992:31).

In the context of this research, it should be noted that CT implies that risks are socially constructed; in other words, people choose what to fear and how to fear it in order to maintain their pattern of social relations (Douglas & Wildavsky 1982).

Furthermore, according to Wildavsky & Dake (1990: 42), the cultural theory of risk can "predict and explain what kind of people will perceive which potential hazards to be how dangerous", and this is an important aspect in the work-based research conceptual framework.

Briefly, this theory comprises two dimensions, representing two types of control: the first is exerted for and by the group, which is a personal control exercised by members over each other. The second includes a rich variety of anonymous controls that do not stem directly from the group, such as conventions that control behaviours, the rules of the road, standards of decency, polite conventions, etc. The theory thus proposes four major biases, based on views and values, as follows:

•**Individualist**
Low grid and low group. Individualists makes their choices in a way that is unconstrained by society and lack close ties to other people. They value individual initiative in the marketplace, and fear threats like war or natural cataclysms, as they would impede free exchange. The individualist view of nature is described as resilient; they believe that nature will return to its original stable position after any disturbance, and therefore embrace the trial-and-error theory, trusting that the system will fix itself in the end.

•**Egalitarian**
Low grid and high group. As the name suggests, these individuals usually live in voluntary associations or groups where everyone is equal, and where the good of the group comes before the good of any individual. From a risk perception point of view, egalitarians are sensitive to low-probability and high-consequence risks (such as nuclear power), demonstrating in this way their solidarity with the "society". This group also sees nature as very fragile; they think that any disturbance will send it crashing down. The egalitarians advocate the precautionary principle; they prefer traditional ways of life that have proven to be sustainable, rather than risking disaster by trying new technologies.

• Hierarchist

High grid and high group. The hierarchists believe that society has a well-defined role for each member. They believe in the need for a well-defined system of rules and fear social deviance (such as crime) that disrupts those rules. An example of the hierarchist society is the caste system in India. This group believes that nature is tolerant, and that we can move within certain limits but if these limits are exceeded the system will collapse. They thus rely heavily on experts, who can identify those limits and establish rules to keep society within proper bounds.

•Fatalist

High grid and low group. As the position on the two axes suggests, the fatalists feel isolated in a world that, in their view, imposes arbitrary constraints on them. They view nature as uncontrolled, and free to move in any random direction. With these beliefs, they feel that there is little they can do to control their situation and therefore are resigned to take whatever fate throws at them. Often fatalists are excluded from CT analyses, because of their passive stance.

There is also a fifth perspective, the asocial *Autonomous* group. Hermits fall under this classification as they withdraw from social interaction, having an autonomous way of life. Because so few people fit this description, and it is by definition not a viable basis for a society, it is often ignored in CT analyses.
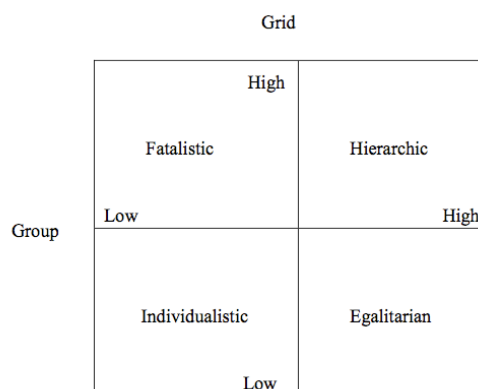
Figure 3: Graphical Representation of Cultural Theory

2.2.7 Use of CT for empirical research

CT and the work of Mary Douglas has had a wider influence outside the discipline of social anthropology; she is widely cited in diverse disciplines such as political science, policy studies, organisational theory, risk prediction and management. Examples include studies on perceptions of health-related risks (Langford *et al.* 2000), industrial safety (Gross & Rayner 1985), risks at collective and individual levels (Dake 1991), the empirical measurement of individual perceptions of environmental risks (Steg & Siever 2000), theoretical criminology (Sparks 2001) and even information systems risk management strategies (Tsohou *et al*. 2006).

Caulkins (1999) challenges the grid/group theory, asking whether the two dimensions of Douglas's theoretical framework can be treated empirically and separately as she contends. This question is of the upmost importance. If the grid and group dimensions could not be empirically measured, then the theory would seriously lack validity.

Caulkins uses a pilot study and factor analysis of pre-coded variables from the sixty-culture Human Relations Area Files (HRAF) probability sample file. He first reviews the conceptual foundations of grid/group analysis, and then selects previously coded variables from the HRAF probability sample file to operationalise the variables of grid, group, and ideology or values.

Interestingly, Caulkins defines himself as a *fatalist*, as does Douglas (2005). He also defines another anthropologist who has criticised Douglas's theory, as an *egalitarian* who rhetorically defends the boundary between other disciplines and "pure" anthropology.

Caulkins argues that, by using factor analysis, it should be possible to show the independence of the group and grid dimensions.

The pilot study undertaken by Caulkins identified the fact that the grid variables loaded primarily on the second and third factors and the group variables predominantly on the fourth factor, thus supporting Douglas's thesis. This is because if appropriate indicator variables have been chosen to support the theory, then the group indicator variables should load on a single factor, and the grid indicator variables on a different one. If, on the other hand, the grid and group variables had loaded on the same factors, this would have been much less supportive of CT. However some problems did come to light as a result of Caulkins' work. It was shown that CT was not easily measurable using the existing cross-

cultural data, and that the group/grid concepts were so dynamically interrelated that the factor analysis used was not effective.

Further cross-cultural research based on CT, such as the study of individual perceptions of environmental risks (Steg & Sievers 2000), demonstrates, however, that significant variations in perceptions and preferences can be found among respondents classified in the four different groups, and these findings support Douglas's theory. Other cross-cultural studies are also worth mentioning, such as the day-long assessments of 300 San Francisco citizens carried out by Dake (1991), which supported the existence of the cultural biases of hierarchy, individualism and egalitarianism and also the idea of the predictivity and preferences regarding risk taking at a social level, based on cultural biases, as per CT.

The recent study of Mars (2008) applies and adapts an approach derived from CT, and in doing so suggests that corporate organisations can be classified as cultures with four archetypal categories as theorised by Douglas.

The aforementioned literature suggests that the group/grid methodology is qualitatively measurable through the use of structured observation indices (adapted from Thompson *et al,* 1990; Douglas 1992; Langford *et al,* 2000), which capture the two dimensions of the theory (see Appendix A).

2.3 Research Statement and Questions

The focus of this research is to investigate the interaction between multicultural crews and safety management systems and its influence on health and safety in the offshore oil industry. The aim is to minimise occupational casualties in the industry by exploring the determinants of the work practices of multiethnic and multicultural crews in the peculiar working conditions of the offshore oil industry, on board an ultra-deepwater drilling ship, and by exploring the social science paradigms of human action and cultural diversity.

My research will try to answer the following main questions:

1. How does the interaction between the human element, represented by a multicultural crew, and the safety management systems that are in place, influence health and safety in the offshore oil industry?
2. How have individuals interpreted and put into practice the safety culture adopted by the company?
3. What do the crew really expect in terms of safety performance?
4. How does the multicultural crew perceive the risks?

5. Is "zero incidents" a plausible goal?

The project relies heavily on ethnographic methodologies, and was carried out through insider work-based research. Because of the aims and qualitative nature of the research, three main data collection techniques were chosen, namely, structured observations, focus groups and semi-structured interviews, and a research diary. Using these techniques, my objectives are to classify qualitatively the risk perceptions of the multicultural workforce through the use of the CT of risk (Douglas & Wildavsky 1982), to determine the risk behaviour types (Cooper 2002) and gain an understanding of safety systems.

METHODOLOGY, RESEARCH APPROACH AND DATA COLLECTION TECHIQUES

3.0   Introduction

This chapter is divided into several parts. First, I will briefly review the methodologies used by practitioner researchers, and carry out an analysis of possible approaches for work-based projects. I will then define and justify my chosen research methodology, ethnography, and the qualitative data collection techniques I have used in this research. I will also explore the advantages and disadvantages of the work-based researcher role, as well as the ethical issues related to this project. Finally, I will conceptualise the validity and reliability of the project and the strategy used for data analysis.

3.1 Methodologies used by Practitioner Researchers

Prior to discussing the methodologies used by practitioner researchers, I would like to take a broader look at research traditions in order to define the ontological and epistemological issues and thereby conceptualise the differences and prerogatives of each method.

Epistemology or theory of knowledge is the branch of philosophy that studies the nature, methods, limitations, and validity of knowledge and belief. The word is based on the Greek words "*επιστήμη or episteme*" (knowledge or science) and "*λόγος or logos*" (reason), and the primary question it addresses is "what is knowledge?"

Practitioner research includes three main significant approaches: scientific and positivistic methodologies; naturalistic and interpretative methodologies; and methodologies from critical theory. Hitchcock & Hughes (1995, quoted in Cohen *et al.* 2000) suggest that ontological assumptions give rise to epistemological assumptions which give rise to methodological considerations, which in turn give rise to issues regarding instrumentation and data collection.

It should be emphasised that research methods are not simply technical exercises. On the contrary, research is concerned with understanding the world around us, informing how

we view it, what we take understanding to mean and what we see as the purpose of understanding.

Observed phenomena can be perceived as objective or subjective. From a positivistic point of view, science is the instrument used to comprehend the world and a means of understanding, predicting and controlling it, with the ultimate goal of generating a theory. However, scientific theory by its very nature could never be complete, in the sense of encompassing all that can be known or understood about a given phenomenon. The positivistic approach seeks large quantities of data with the intention of making generalizations. In contrast, a naturalistic approach aims to get closer to individuals and inside institutions in order to understand situations and people, which is the aim of my research, as explained in the previous chapter.

As a mariner, the problem of calculating longitude comes to my mind: while it was relatively easy to determine the latitude, longitude was more difficult. Amerigo Vespucci was probably the first sailor able to calculate the longitude by comparing the relative positions of the moon and Mars with their anticipated positions, and to do so it was extremely important to determine the exact time. Here the objectivity of the observed phenomena is important. Hypotheses and concepts play a primary role in the scientific method as well as the set of procedures, which shows how the findings have been achieved and needs to be sufficiently clear that the results can be repeated.
This is a classic positivist approach; it seeks large quantities of data with the aim to make generalizations.

Fetterman (1998:8) points out that "people act on their individual perceptions, and those actions have real consequences, thus the subjective reality each individual sees is no less real than an objectively defined and measured reality".

In social science there are a variety of schools of thoughts with different epistemologies, Fetterman (1998) highlights that the ethnographer recognises the importance of understanding the epistemological basis for a selected model, with the main aim being to understand the subjectivity of the world of human experience.

The methodologies used by work-based researchers are generally pragmatic. They are often underpinned by interdisciplinary skills and knowledge. Often, work-based knowledge involves the human dimension and professional practices WITHIN work organisations and, therefore, qualitative data are gathered, although some work-based projects involve 'hard science' and therefore the choice in this case is quantitative. This work-based study,

supports the qualitative analysis.

In short, as described by Armsby (2000) and Armsby & Costley (2003), work-based learning uses academic and theoretical knowledge in work-based projects which have a real and useful outcome.

Grounded Theory (Glaser & Strauss 1967; Glaser, B. 1992) is a very practical method used for work-based projects in which the theory is *'grounded'* on data generated by research. It should not precede the research but follow it. The researcher should not have preconceptions while creating a theory, although a practitioner can be biased and influenced to a certain extent because of his of her subject expertise and experiential learning, but this must be acknowledged through reflective practice.

The organisation and the professional background involved can affect the research methodology. For example, the research topic may be dictated by management, rather than left up to the researcher. In this case he may be less able to have his own perspective or tackle the research using his own initiative and reflective practice. I have clearly state the advantages and disadvantages of my role as a work-based researcher later on in this chapter, and I also acknowledged potential influences on my project. In his ethnographic studies, Fetterman (1998) acknowledges the importance of biases. He elaborates on the concept of positive and negative functions. When controlled, biases can focus and limit the research effort, while when they are uncontrolled they can undermine the quality of the research.

Often work-based learning develops its own epistemologies or multi-methodologies, as it is possible to use mixed methods appropriate to the type of research planned.

Bell (1999:10) makes the point that 'the case-study approach is particularly appropriate for individual researchers because it gives the opportunity for one aspect of a problem to be studied in some depth within a limited time scale'. The case study has also been described as 'an umbrella term for a family of research methods having in common the decision to focus on inquiry around an instance' (Adelman *et al.* 1977).

Cohen *et al.* (2000) define case studies to be interpretative and subjective, and therefore well suited for qualitative studies. However, I did not select the case study approach for this project for various reasons, the main one being that I did not intend to study a single aspect of the problem, but many aspects. Thus, in my investigation, I took a naturalistic and interpretative approach, with an ethnographic methodology, in order to generate a grounded theory.

Action Research (AR, McNiff 2002, Burns 2007) is often used by work-based researchers as its prerogative is starting with a problem that needs solving. It is a strongly practical methodology drawn from Critical Theory. It is based on a spiral activity, where the researcher goes through repeated cycles. The spiral is composed of a Plan, a phase of Action and Observation and then one of Reflection; this cycle is then repeated with a revised Plan followed again by Action/Observation and Reflection. The aim of AR is to uncover the vested interests at work, revealing to the participants how they may be acting to perpetuate a system which keeps them either empowered or unempowered. Cohen and Manion (1994:186, quoted in Cohen *et al*. 2000) define AR as "a small-scale intervention in the functioning of the real world and a close examination of the effects of such intervention".

I contemplated the idea of using the AR approach, which is holistic, context-bound and produces practical solutions and therefore particularly suitable for professional-type research, which often deals with individuals and members of social groups and, most importantly, involves change intervention. I eventually decided not to use the approach, because of its feature of starting with a problem to solve (Bell 1999, Cohen *et al*. 2000), whereas my investigation did not start with a stated problem. I decided that, should I identify a specific, objective problem during my investigation then AR could be applicable for future developments of this research.

This approach starts with a problem situation to be addressed, so it can be applicable only in some researchers, which is not the case of this project. Soft Systems Methodology attempts to promote learning and appreciation of the problem situation between groups of stakeholders. Again, this methodology was not selected, as my investigation does not start with a problem situation as explained in chapter 2.

Another methodology used by practitioner researchers is the Soft Systems Methodology (SSM, Checkland P. 1999). A key feature of SSM is that users are advised to keep the project vague and wide ranging for as long as possible, to not jump to conclusions but analyse the problem and any possible solutions before taking any action. There are two main modes within SSM, one involves real world activities and ideal models and the other involves systems thinking about the real world. This methodology places an emphasis on people's perceptions of reality and work, with the notion of a problematic situation in which different people might perceive different aspects to be problematic. It attempts to promote

learning and an appreciation of the problematic situation by different groups of stakeholders. Again, this approach starts with a specific problematic situation that needs to be addressed, and so is applicable in only some cases. My investigation does not start with a problematic situation as explained in chapter 2, thus this methodology was not selected.

This work-based research involves the human dimension. Therefore, in my investigation I support a naturalistic and interpretative approach, with ethnographic methodologies and qualitative data, "where meanings rather than frequencies assume paramount significance" (Kirk & Miller, 1986:5).

3.2 Research approach

Because I am a participant observer in the community of practice under study for long stretches of time, that is, a month on board the drillship alternated with a month of rest, the ethnographic approach was selected as the most appropriated. This methodology allows me to carry out an intensive period of fieldwork, and then take a month's break which permits me to make sense of what I have observed and recorded. Then, I can go back to the field and test my hypotheses. Although, historically, ethnography has been associated with anthropological studies, from the 20th century onwards, ethnography has featured increasingly in studies on education, organisations and communities (see, e.g., Kanter 1993, Fetterman 1998). The context in which the community under study is interacting with the Safety Management System, is extremely important to the project. Kanter (1993) highlights that people's attitudes and behaviours take shape as a result of the experiences they have in their work. In a nutshell, her definition is: "the job makes the person".

As mentioned above, this research was developed under the interpretative paradigm as opposed to the normative one. The table below captures the key points of the two models.

Table 1: *Paradigm perspectives*

Normative Paradigm	Interpretative Paradigm
Human behaviour is rule-governed.	Characterised by a concern for the individual.
Investigated by methods of natural science.	Aim to understand the subjectivity of the world of human experience, understand from '*within*'
BEHAVIOUR Behaviour responds to external environmental stimuli (i.e. the demands of society) or internal stimuli (i.e. hunger). In both cases, the cause lies in the *past*.	ACTION Focus on action, and behaviour with meaning. The cause lies in the *future*. Actions are meaningful only if we are able to ascertain the intention of the actors and share their experiences.
THEORY Generate a general theory of human behaviour and validate it through complex research methodologies.	GROUNDED THEORY Begin with individuals and set out to understand their interpretations of the world around them. Theory is 'grounded' on the data generated by the research. Theories should not precede the research but follow it.

Source: Cohen *et al.* (2000)

As explained earlier, qualitative analysis is appropriate for this study, and a strong emphasis is placed on the fieldwork that I have carried out as a participant observer (Fetterman 1998; Kirk & Miller 1986; O'Reilly 2005).

Fetterman (1998) defines ethnography as "the art and science of describing a group or culture" (p.1). O'Reilly (2005) describes it as a "methodology that acknowledges the complexity of human experience and the need to research it by close and sustained observation of human behaviour" (p.1). These statements show how extremely relevant to my research ethnography is.

I have used an *emic* perspective, which is defined by Fetterman (1998) as the insider's or native's perspective of reality. This concept is of relevance to my work-based research, as I am a participant observer and therefore am aware of the perceptions that I am trying to evaluate. This is in contrast to *a priori* assumptions that a researcher may make about how a system works (O'Reilly 2005). I am taking a 'meaning-orientated' point of view, which sees behaviours as determined by the phenomenon of experiences, rather than by external, objective and physical reality. In addition, ethnography enables me to observe

and analyse human interactions and gain results not achievable through classical positivistic and quantitative approaches.

Fetterman (1998) argues that in his extensive fieldwork as a participant observer on research projects, the ethnographic approach has enabled him to understand the behaviours, moods, fears, and values of the community under study. He addresses culture as the broadest ethnographic concept, which either embraces a *materialist* or *ideational* perspective. The former is an interpretation of a culture which focuses on behaviours. In this view, culture is the sum total of the social group's observable patterns of behaviours, customs and way of life. The definition of an ideational culture on the other hand is cognitive, and according to this approach, culture comprises the ideas, beliefs and knowledge that characterise a group of people. It should be noted that this definition specifically excludes behaviours, but Fetterman points out that the ethnographer needs to understand both behaviours and knowledge to describe a culture adequately, and it is my intention in this research to address both aspects.

I found many descriptions of insider research in the literature, but they mostly relate to '*going native*' or becoming part of the culture studied. If there is a description of an anthropologist or ethnographer as an insider researcher, it is always made in cultural or ethnic terms, and does not refer to a researcher in a work culture, studying his/her own community of practice or profession, that is, practitioner research. I believe this is a very relevant point.

Social anthropology often uses a form of investigation called participant observation (Hendry 1999) with the idea of finding out exactly what it is like to be a member of the society in question. This approach has advantages as it means that I do not need to 'go native' because my role as practitioner researcher already falls under the 'native' description. In addition, Kirk & Miller (1986:9) state that "qualitative research is a particular tradition in social science that fundamentally depends on watching people in their own territory and interacting with them in their own language, on their own terms".

Reflexivity, which, as Davies (2008) explains, expresses "researchers' awareness of their necessary connection to the research situation and hence their effects upon it" (p.7), also plays a role in this investigation.

Given this connection, I continuously reflected upon the effect that I might be having on the research itself in my role as practitioner researcher, and I constantly recorded my reflections and thoughts in my research diary.

Although there is an assumption that in both social and natural sciences we are investigating something 'outside' ourselves, often in the social sciences the researcher is in some way connected to the objective of the research. This is especially true in work-based projects, and in my investigation I thus acknowledged the reflexivity and subjectivity of my studies. These issues were addressed through the ethical considerations and when I analyzed my role as work-based researcher, which is presented later on this chapter. This is the worker-researcher duality the `positionality' which defines WBL.

3.3 Sampling, Gaining Access and Data Collection Techniques

Cohen *et al. (*2000) suggest that, in the real world, "the researcher should be able to study a group in its entirety" (p.143) but they also add that this is rarely possible and that "the researcher is faced with the issue of sampling" (p.143).

Along with the methodology, the sampling strategy chosen can undoubtedly affect the quality of a piece of research (Cohen *et al.* 2000). Therefore, I carefully considered several important factors in selecting my sampling method, including expense, time and accessibility.

In my role as a practitioner researcher engaged in an ethnographic study, I spent long stretches of time on board offshore units, which is where my target group works *and* lives. Although it can be very important in a research context, in this study the expense factor did not play a role, as I did not incur any costs in accessing my target group, the multicultural offshore community.

The second factor I considered was time, that is, how much time could I devote to my project's data collection phase? Again, the fact that I was taking the role of a practitioner researcher was significant. I spent a month at a time on an offshore unit on international assignments. During those periods I was constantly, 24 hours a day, immersed in the working community under study. I was thus able to devote much of my time to my work-based research during the fieldwork phase, which took a total of 120 days. In addition, I was able to access the target group easily given that, as has already been mentioned, the community of practice is working *and* living in the workplace.

Another important aspect that I needed to consider was the sample size, the questions being: how much is enough? And how much is too much? I was engaged in a qualitative piece of research, with a total target group consisting of the 172 persons on board at a

time. As highlighted by Cohen *et al.* (2000:93), "in an ethnographic or qualitative research it is more likely that the sample size will be small". However, as I was not constrained by money, time or access in this project, I elected to carry out the following:

- ➢ Semi-structured Interviews: 14
- ➢ Focus Groups: 5
- ➢ Observations: 74

I considered fourteen interviews to be a sufficient number to collect the qualitative data I needed from the heterogeneous target group; five focus groups enabled me to interview 25 persons and therefore strengthen the reliability of my data.

I carried out seventy-four observations, quite a large sample, again due to the heterogeneity in the population.

- o Representativeness and parameters of the sample

The target group is composed mainly of employees who work for the same company as the researcher and have at least one year's experience offshore. 80% hold entry level jobs of different functions on board the offshore unit (marine/deck, technical and drilling) and the remaining 20% hold supervisory jobs. Having at least one year's experience ensures that the sample employees have exposure to the offshore environment. The 80/20 percent split between entry level and supervisory level employees was chosen to represent in percentage the total multicultural crew which is composed largely by entry level, hands on type of employees, but also by those in supervisory capacities, even if in a less extent.

- o Access to the sample

My sampling strategy for selecting participants was based on asking them to volunteer. I asked the employees from the main sample if they were willing to participate in the research, informing them about the focus of the project and what their role would be through a participant information sheet (Appendix E).

o   Sampling strategy

A sampling frame (criteria for selecting sites and/or subjects) was developed to select the participants for the research and, given the goals and logic of qualitative research, a purposive sampling strategy (Cohen *et al.* 2000; Patton 2002) was selected as the most appropriate for this study.

The other main method of sampling is the probability or random sample (Cohen *et al.* 2000). The most important difference between probability and purposive (or non-probability) sampling is that, in probability sampling, every member of the wider population has an equal chance of being included in the sample, which is not what I wanted in my sampling frame.

As an insider work-based researcher I am very familiar with the target group and I had a clear idea (purpose) of the sample I wished to select, including people with an interest in, prior knowledge of and experience of the research context, with at least one year's exposure of the offshore environment. I excluded those who did not suit that purpose. This sampling technique is in fact often employed in qualitative investigations, where non-random sampling and the criteria used to select the participants is more important than the number of people interviewed. Individuals' characteristics are used as the basis for selection, and they are most often chosen to reflect the diversity and breadth of the sample population.
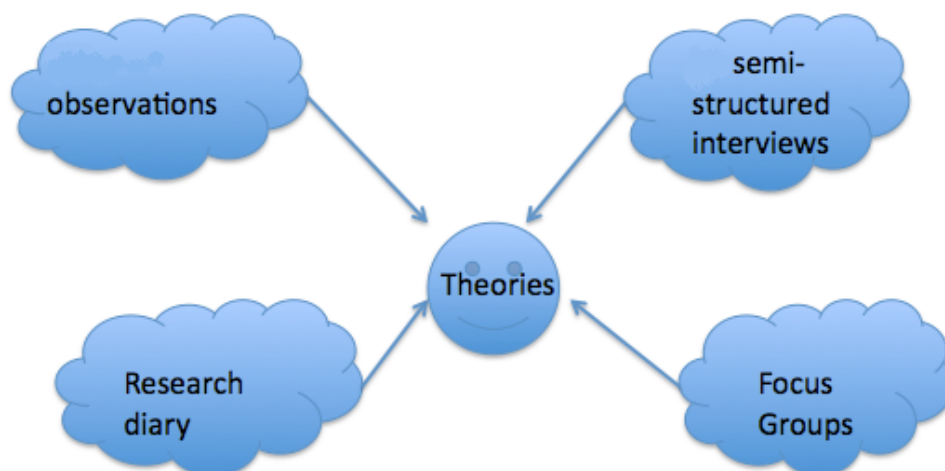
Figure 4: Graphical Representation of the Data Collection Techniques

3.3.1 Data collection techniques

Due to the aims and qualitative nature of the research, I chose three main data collection techniques, which are detailed below.

"Direct observation supplemented by immediate interrogation is the ideal course" (Royal Anthropological Institute 1951:27, quoted in Kirk & Miller 1986: 61).

This quote represents the classical ethnographical approach. While traditional models assume the 'cultural insider' authority of the author, who claims the "*native's point of view*" as the validity of his or her interpretation, this is not always the case. Fine (2003) argues that his work from the field reflected an isomorphism between empirical descriptions and what was actually happening "*out there*". I do not have his authority as a trained observer, but I do agree with his assertion that today we no longer need to be reporters of the exotic, but rather interpreters of the patterns of work or domestic life.

I wanted to describe and understand what was happening *"out there"* but I also had to bear in mind that I was also involved in the subject under study and a part of it. This meant that my subjectivity had to be made transparent through continuous reflection on the research process. Therefore I chose primarily:

- a structured observation schedule (see Appendix A),

- a research diary,

- semi-structured interviews (see Appendix B) and

- focus groups.

3.3.1.1 Structured observations

A structured observation schedule was adopted as a qualitative data collection technique to concentrate on the "workplace culture". The anthropologist Mary Douglas (1992) does not view workplace culture as static but, on the contrary, she affirms that it is a way of life created constantly by everyone involved in the organisation, in other words it is the result of the daily activity, conversations and negotiation between members of the organisation. I benefited from my insider researcher role as participant observer which allowed me to understand the workplace culture from an "inside" perspective. I planned to collect around 75 observations during the data collection phase of the research. The observations were

of the naturalist type, meaning that they would be hypothesis-generating rather than hypothesis-testing, which is typical of highly structured observation (Cohen *et al.* 2000).

I was very aware of taking on a challenging task as it is often said that understanding human beings is more of an art than a science. In addition, part of the literature suggested that it is impossible to establish an explanatory social science to find regularities in human activity. However, in order to empirically measure the perceptions of the crew, as explained in the previous chapter, and to comprehensively assess the "workplace culture", I drew heavily on the work of the anthropologist Mary Douglas (1921-2007). My reasons for doing this are based on the fact that I needed to measure, qualitatively, in my work context, the multicultural dimension based on an adequate model of 'culture'. I thus proposed to use Cultural Theory or Grid/Group Theory (Douglas 1982; Thompson *et al.* 1992), which, as explained in Chapter 2, is a two-dimensional framework of cultural comparisons comprising four distinctive ideologies or values.

The group/grid methodology is qualitatively measurable through the use of structured observation indices (adapted from Thompson *et al.* 1990; Douglas 1992; Langford *et al.* 2000) which capture the group and grid dimensions. Through this, my aim was to understand where along the two dimensions the observed multicultural workforce can be allocated.

The measurable group indices are as follows:

- ➢ Proportion of time spent in the group by a worker compared with other crewmembers.
- ➢ Frequency of attending meetings and/or "Think" plans (safe job analysis, discussion and planning of operations).
- ➢ Closeness of connecting character links
- ➢ The ratio of shared to unshared interest, job knowledge.
- ➢ Strength of the boundary of the group.

Measurable grid indices are as follows:

- ➢ Is the style "egalitarian" or is there a clear leader?
- ➢ Are there "underdogs" and "top dog" types in the observed group of workers?
- ➢ What are the theories of social justice that supports this distinction?
- ➢ Grid is high whenever roles are distributed on the basis of social classifications such as:

- age-grading

- nationalities

- sex

In the observation schedule, I have decided to structure the grid and group indices (see Appendix A) in order to measure for qualitative variables the position of the crew members in the two dimensions of the Cultural theory.

The workplace culture includes the safety culture of the multicultural crew, which is defined as follows:

"A belief, philosophy or faith held by groups or individuals on safety matters which is demonstrated in practice through the attitudes, actions and behaviour adopted by the people of an organisation or a nation" (Kuo 2007:274).

The safety culture is observable by a researcher with insider knowledge of the community of practice. He or she is able to qualitatively appraise specific characteristics such as the shared attitudes, values, beliefs and practices of the people at work.

I was interested in measuring the risk behaviour types to develop qualitative variables and for this purpose I used the table below, which is adapted from Cooper (2002). For example, a crewmember attempting to lift a heavy weight using a crane, an operation that is very common in the daily activities of an offshore unit, with a lifting wire inadequate for the weight that is being lifted, counts as risk-producing behaviour. If the employee or group of employees is wearing the proper personal protective equipment (PPE), this is a mitigating behaviour.

Table 2: Classification of Risk Behaviour Types

Behaviour Type	Example
Risk-Producing	Lifting incorrectly
Mitigating or Alleviating	Wearing PPE
Procedural (Risk Control Systems)	Following explosion size controls
Supportive (SMS System)	Reporting accidents/incidents
Safety Leadership	Acknowledging safe behaviour

3.3.1.2 Research diary

I used a research diary as an extra means of gathering data, in addition to the semi-structured interviews and structured observations. Although I was aware that compiling a diary could be time consuming, I felt that it could provide valuable information for my study. The two aforementioned data collection techniques would enable me to measure empirically the behaviours of the community under study in a clear and structured way. However, the diary would enable me to register in broader terms my involvement in the project. The diary would record the progress of the research in general and would eventually generate a history of the project.

The diary would also be a useful tool for me to use to reflect on the project. I believe that it is an important tool for a participant observer researcher. I used it to record my experiences with my peers and the participants in the project, and my personal reflections on the fieldwork and the exploration of my professional practice.

I wrote in my diary on a regular basis, generally at weekly intervals, but I also made an entry whenever I had an insight into the project. I used an electronic diary and made backup copies to avoid losing data. I used a notebook during the fieldwork to make quick notes, which could then be expanded on in the electronic diary.

I wrote down what had happened since the last entry, including conversations,

discussions, interviews, topics for further study, thoughts and inspirations. I also wrote about my reflections on the project and possible plans for future research.

3.3.1.3 Semi-structured interviews and focus groups

As detailed below, I interviewed fourteen people and carried out five focus groups, using a purposive sampling technique to select the participants (Cohen *et al.* 2000; Patton 2002).

Cohen *et al.* (2000:267) state that *"(interviews) enable participants to discuss their interpretations of the world in which they live and to express how they regard situations from their own point of view"*. It should be noted, however, that interviews reveal only how people *perceive* what happens, and not what actually happens (Bell 1999).

I set a framework of themes to be explored in a two-way communication. This allowed the respondents the time and scope to talk about a specific subject, with the objective being to collect research data. In addition, this technique is a way of obtaining data about feelings and emotions that cannot be recorded easily during observations. Cohen *et al.* (2000) suggest that this type of interview is useful for framing questions that will contribute towards providing the knowledge sought. In addition, the technique allows the respondent to talk in depth and in detail about the given topics. Complex subjects can be clarified, and issues can be picked up that may not surface during observations. It is also easy to record the interviews with a tape recorder for future analysis. Unstructured interviews (Bell 1999:138) may produce a wealth of valuable data, but it requires a great deal of expertise to control them and a great deal of time to analyse the results. Therefore, I selected semi-structured interviews as the most appropriate for this research context.

In the light of the research questions and in order to contextualise and frame the topics I had elected to explore, I divided the interview into five categories, as explained in detail below.

❖ Section 1

In the first section, my aim was to measure the understanding of "safety" as a qualitative concept. I was interested in comprehending the participants' opinions. How did they define the notion? Did they see it as a value, a priority or something else? I was also interested in exploring any reactions to the company's Safety Vision, which is that *"operations be conducted in an incident-free environment, all the time, everywhere"*. I felt that it was important to determine whether the multicultural crew was aware of the safety vision. It is

a goal set by management with regards to safety but can it be achieved if it is not known or understood?

- ❖ Section 2

In this section I aimed to measure the understanding of *hazard identification*, which is defined 'as the potential to lead to harm'. I was interested in exploring this concept because I believe that, if it is not understood, the whole safety management system is in jeopardy. Hazard identification is the very first step in making an offshore oil environment safe. A lack of appreciation of this step makes it virtually impossible to assess the risk involved in an operation. If the participants were not able to understand this concept they would be unlikely to be able to identify the hazards involved in the operation.

- ❖ Section 3

This part of the interview is linked to the previous one. Specifically, I aimed to gauge the participants' understanding of risk, which is defined as the probability of a harm being realised. The orthodox approach would be first to identify the hazard, and then assess the risk. Often the two terms are confused. I wanted to explore the concepts to understand whether the participants had a biased perception of them which could have an impact on safety management. Therefore, Sections 2 and 3 are conceptually linked and cover two important issues that need to be explored in the context of this research.

- ❖ Section 4

In this section, the aim was to determine whether the respondent had an understanding of the health and safety management system, and was committed to it. I was also interested in understanding the views of the multicultural sample of participants regarding management's commitment to the safety system, as the literature suggests that this commitment impacts employees' safety behaviour by 35 to 51 percent (Cooper 2006). In addition, I wanted to understand whether the participants experienced a "cognitive dissonance" (Festinger 1962). (see proposal p.3)

- ❖ Section 5

In the final section, I aimed to understand whether the workforce felt accountable for health and safety, in other words, whether they were aware of their own role in the safety system. The company takes a pro-active approach to the safety system. This is achieved by empowering the employees with the authority to stop any unsafe act. Is this the reality?

The last question in this section dealt with the impact (if any) on the participant's life of any incidents that had occurred.

The same semi-structured interviews were also used with the focus groups in order to gather data from a larger number of respondents, again chosen to fit the profile detailed in the sampling strategy.

Focus Groups

I conducted five focus groups each with between three and eight participants, making a total of twenty-five interviewees.

O'Reilly (2005) states that focus groups are a data collection technique which were first used in market research to test reactions to new products. A well-known example cited in Morgan and Krueger (1998) involves the sale of boxed cake mixes. Historical antecedents of focus groups were also used during World War II. These included discussions of participants' positive and negative emotional reactions to radio programmes. Today this technique is widely used in social research, especially in cultural studies, to research audience interpretations of cultural topics. O'Reilly (2005:132) describes focus groups as "a group of between four and twelve,. …selected and brought together to share a discussion about a topic".

Bryman (2004) reports that qualitative research based on this method can include quite large variations in the number of groups (citing examples of between 8 and 52) but points out that "there does seems to be a tendency for the range mainly to be from ten to fifteen" (p.349).

A single focus group is very unlikely to fulfil the needs of the researcher but there are strong arguments indicating that too many groups would be a waste of time. If too many groups have been used, the researcher is likely to be able to anticipate what the group will say (Bryman 2004).

Obviously time and money are surely a constraint, but given my role as practitioner researcher, I was able to organise five Focus Groups during the periods of time I spent on the ship, fully immersed in the community of practice that I am interested in.

Cohen et al. (2000) highlight the fact that participants in focus groups interact with each other rather than only with the interviewer, which can help their views to emerge.

3.3.1.4 Data collection techniques: summary

The aforementioned collection techniques were chosen to enable me to define qualitatively the multicultural workforce and to provide data which I could analyse and interpret to answer the research questions.

Figure 5: Graphical representation of data collection
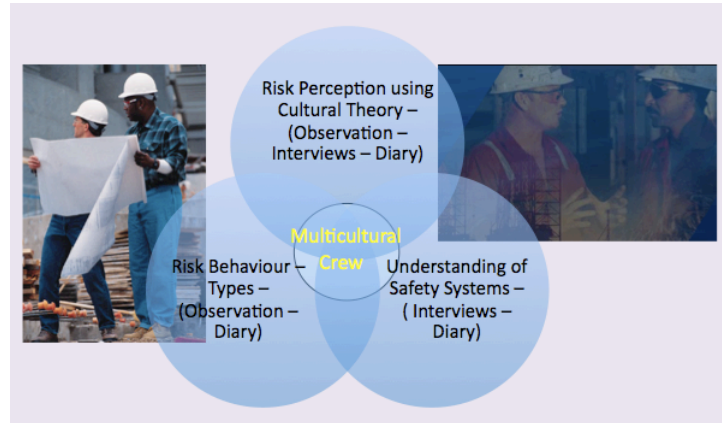
I used the informed consent approach (Davies 2008), which is standard across social research. I ensured that, during observations and especially during the interviews, participants were aware of my research, what it was about, why it was being undertaken and how it would be disseminated.

I often acted as a "complete participant" (LeCompte and Preissle 1993:93-4,quoted in Cohen *et al.* 2000:310) as I had an insider role in the group being studied, and it would have been difficult to declare to every single member of the community that I was doing work-based research. I did, however, give to the participants a small signed statement about the research I was conducting, its purposes, and the use it would be put to (Appendix E). I do not believe that this project would be considered covert research, but the ethical considerations did have to be carefully addressed. This means that it was my responsibility to explain fully to the participants what the research was about and how it would be disseminated. The main aim was to ensure that the research could not be considered covert, that full consent had been obtained and it was conducted with the full knowledge of the participants. I also ensured confidentiality by not mentioning names, nicknames or any other codes which could identify the participants (Appendix E).

3.4 Consideration of my role as worker/researcher: advantages and disadvantages

As I pointed out earlier in this chapter, I analysed my role as insider researcher and came to the conclusion that it had some advantages and some disadvantages for this project.

Advantages:

· Operating in an international context
· As insider researcher I have access to a lot of knowledge, insight and information from the industry, in an international context, such as procedures, alerts, safety bulletins, safety lessons learned, etc.
· Insider knowledge of the company
· Good support from the management
· I am involved in the safety of the ship and am therefore familiar with the issues
· Reduce the difficulties in research in term of access to and rapport with participants

Disadvantages:

· Difficulty combining research with being an efficient and effective worker
· Possible bias during the research a `*critical suspicion*` approach had to be adopted
· Being closely involved in the team's evolution and development worked against my attempts to gain sufficient distance to see the issues more clearly
· An insider researcher may be tempted "*not to tell*" if the standards of the company seem inadequate
· As an insider researcher there is a possibility of criticism and discussion of the findings

I will now discuss the important issue of the ethical impact of this project.

3.5 Ethical considerations

I am aware that qualitative research in general, and ethnography in particular, especially in a work-based project, can raise ethical issues, as we are looking into people's daily activities, watching them, asking them questions, and writing about what they do and what they say. Such an approach brings ethical dilemmas to the surface that are inherent in any situation involving a participant observer and participants.

O'Reilly (2005) argues that ethical considerations should not be a reason not to conduct research, but should keep us reflexive and critical. Since my work-based project is a piece of overt research I had to ensure that my role as insider research was clearly defined. I needed to ensure that the participants would not feel compelled to participate, and particularly that my role as the Master of the ship would not add pressure on the personnel being observed. To overcome this issue during the observations, I first asked the permission of the participants. It is part of our company management system to perform regular safety observations. The crew is thus used to this type of safety approach and so I did not envision encountering any uncomfortable feelings during my field data collections. Nevertheless, I ensured that the people being observed were made aware that my observations would be used for this project. This was explained to them prior to start of the observation.

Regarding confidentiality, as mentioned earlier, I ensured that there was no mention of names during the collection and analysis of the data.

It is important at this point to explain the difference between confidentiality and anonymity. The latter term indicates that nobody, not even the researcher, can identify who provided the data. This is impossible with an ethnographic approach. However, I was able to ensure confidentiality and, as will be explained to the participants, my observations and interviews will only be used for my research, and not for any other objective.

In the light of these ethical considerations, this project is based on the voluntary, informed consent of the interviewees and observed employees. Thus, one of my responsibilities was to explain fully what the research would be about and how it would be disseminated. In brief, the aim was to ensure that the research did not turn into *covert research,* that is, I wanted to gain the full consent of those involved and conduct it with the full knowledge of the participants. As O'Reilly (2005:61) reports, the ISA Code of Ethics suggests that covert research should be avoided in principle, unless it is the only method by which information can be gathered or when access to usual sources of information is obstructed by those in power.

Long-term projects, although carried out as overt research, can lead to people forgetting that they are being observed and researched, and this should be borne in mind in work-based research.

Another aspect of work-based research, and generally in any social research, is that the researcher is responsible not only to his or her profession, in terms of seeking practical knowledge and improvements, but also to the participants.

I took steps to ensure that my research respected the dignity of the participants. I cleared the research through official channels by formally requesting permission to carry out an investigation into my workplace and by submitting a learning agreement along with my full research proposal. My employer, as one of the stakeholders, signed this agreement. I also signed an ethical release form and submitted it to the IWBL. This meets the needs of the doctorate's ethical requirements and the University's Ethics Committee.

My strategy in the field was as follows:

I)   I spoke to the people who would be asked to participate in observations and interviews, explaining the aim of my project.

II)   I ensured confidentiality by not mentioning any names, nicknames or any other codes which could identify the participants.

III)   At the end of the interviews, I showed the interviewees the draft transcripts.

IV)   I explained to the participants that I was doing this research as a DProf candidate and not as Master of the ship. I explained that participation in the project was absolutely voluntary.

3.6 Validity and reliability

In order to strengthen the reliability of the project, I asked a colleague to independently assess my schedule ratings. I also asked for his collaboration during the data collection and analysis phase as this will give me the possibility to share my analysis with a colleague within my practice, and hence a way of checking reliability. (Appendix F).

I also triangulated the data gathered using the different collection techniques (structured observations, semi-structured interviews and diary) in order to enhance the validity of my findings.
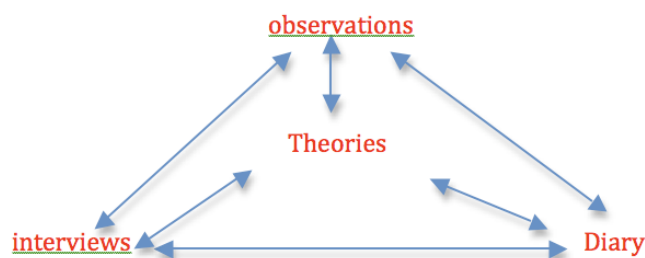
Figure 6: Data triangulation

59

3.7 Summary

In this chapter I have critically reviewed various research paradigms to explain how I selected my approach for this study.

The ethnographic methodology and qualitative data collection techniques were analysed and shown to suit the needs of this investigation.

It was explained that the data collected would be linked through triangulation, which would help to validate the findings and recommendations, along with the addition of a critical review of the data collected by an independent professional with command experience in the industry.

Ethical issues related to the research were critically discussed as well as my role as a work-based researcher.

C H A P T E R 4

PROJECT ACTIVITY

4.0 Introduction

This chapter describes my project activity. I report the way I observed practices and measured types of behaviours during my ethnographic investigation with a depth of engagement. I spent a total of 120 days as a participant observer on board a dynamically positioned drillship for the fieldwork phase of this work-based research, working in three different countries, namely South Korea, Malaysia and India.

Figure 7: Researcher engaged in the fieldwork activity

I started this phase of my research after laying down the methodological foundation of my project activity as detailed in the previous chapter, critically selecting my research methodology and data collection techniques. The fieldwork activity of my qualitative investigation started in South Korea, as previously mentioned, more precisely in Busan port, where I joined a new drillship just delivered from the shipyard. I felt very fortunate to have the privilege of assuming command of a latest-generation dynamically positioned drillship with 96,000 tons of displacement, that was equipped to work in water depths of up to 12,000 feet (3,657 metres), and outfitted to construct wells up to 35,000 feet (10,688 metres), with a crew of 172 persons of at least seventeen different nationalities. The delivery cost of the drillship was 685 million USD, and it was operating at a hiring rate of 510,000 USD a day over a five-year contract.

I commanded the ship on her maiden voyage (De Rossi, V. 2009c) from Busan, South Korea, to Johor Bahru, Malaysia, where we stopped for commercial operations, prior to commencing exploring off the coast of India. Since then, I have been steadily assigned as her Captain during the drilling operations in Indian waters on a month-on-board-month-off basis. My data collection techniques enabled me to measure types of behaviours and practices that would not surface during my normal professional duties. This made me reflect on the appropriateness of my ethnographic methodology and chosen techniques. I also developed situational thinking during the fieldwork phase of my work-based research. This is obviously the core of my project and the days spent collecting data were invaluable.

4.1 Research process and preparation

As a Master Mariner in command of dynamically positioned drillships engaged in oil and gas exploration worldwide, I am very interested in the safety aspect of our operations–it was one of the main motivations behind my research. This interest has been channelled into an investigation of the interaction between multicultural crews and safety management systems and its influence on health and safety in the offshore oil industry. As stated earlier, my aim was to investigate the impact that globalisation has had on health and safety in this industry, as we move from local and national regulation regimes to a global, borderless market with a multicultural environment subjected to waves of national de-regulation and the pressures of competition.

During the fieldwork, I was careful to pay attention to the ethical implications of my role as a work-based researcher in command of a drillship. This important issue was carefully addressed during the research process and proved to be a key element during the data collection phase. In the previous chapter, I explained in detail how I dealt with ethical issues during my ethnographic investigation as a participant observer.

In gathering the data I interacted, in the context of the project, with crewmembers of at least **ten** different nationalities, and with crewmembers belonging to both the operations and maintenance departments of the drillship.

4.2 Data Collection

➤ 4.2.1 Activity 1: Observations

I collected a total of 74 observations over around 120 days spent on board the drillship, while it was engaged in oil and gas exploration. This is a bit less then one observation per day, which I found to be a workable average. I tried to perform one daily observation throughout my time on board, although I sometimes found this difficult due to my work commitments. Thus, on some days I was unable to observe practices and behaviours.

I used a structured observation table (see Appendix A) to prompt me regarding what I needed to observe. This was quite different from what I *looked at* during my time on board the ship. I have *looked at* operations, practices and behaviours for a long time. I have spent the last eighteen years of my career in the offshore environment but I had never previously actually *observed* these practices in such a deep and reflective way. I was amazed to realise that I was able to observe, and most importantly record, events that I had seen many times before but never with such a deep level of engagement.

My observations were broken down into two main objectives: to observe the grid-group indices (Douglas 1992) and the risk behaviour types. The first objective was significant for collecting data relating to Cultural Theory, while the second objective was equally important for determining the existing safety culture present on the ship.

➤ First objective: Cultural Theory determinants

One of my interests in collecting data through the structured observation schedule was to empirically measure the group and grid indices as outlined in Cultural Theory (Douglas 1992, Thompson *et al.* 1990*)*.

While taking observations, I realised that, although I was a participant observer, by standing back and actually monitoring the various activities carried out on board the offshore installation, I was able to record measurable group and grid indices (Douglas 1992), with the use of the table (shown in Appendix A) as a "prompt card".

As already mentioned, Cultural Theory has been applied before in studies related to risk perceptions, both health-related risks (Langford *et al.* 2000) and industrial risks (Gross & Rayner 1985) and with qualitative and mixed methodological approaches to identify the factors that influence the way the risk is perceived. Therefore, this was an important part of meeting my research aims.

The structured observation table (Appendix A) adapted from Thompson *et al.* (1990), Douglas (1992) and Langford *et al.* (2000) enabled me to record the measurable qualitative group/grid indices which captured the two dimensions of the theory as outlined in the table here below. I coded the group and grid indices with five categories, 1G to 5G and 1I to 5I, respectively (see Appendix **G**)

Measurable Groups Indices:	**Measurable Grids Indices**:
Proportion of time spent in the group by crewmember(s) (High/Low Group)	Leadership style, i.e. no clear leader "egalitarian" style (Low Grid)
Frequency of meeting and/or "Think" plan (discussion and planning of operations) (High/Low Group)	A clear leader is identified (High Grid)
Closeness of connecting character links (High/Low Group)	There are "underdogs" in the group (High Grid)
Proportion of shared tasks and job knowledge (High/Low Group)	Individualist type, or work-alone type (Low Grid)
Strength of the boundary of the group (High/Low Group)	Roles are distributed on the basis of social classifications such as age, nationality, sex (High Grid)

Table 3: Measurable Groups and Grids, adapted from Thompson *et al.* (1990), Douglas (1992), Langford *et al.* (2000)

The anthropologist Mary Douglas (1992) views "workplace culture" not as "static" but as a way of life created constantly by everyone involved in the organisation. In other words, it is the result of the daily activity, conversations and negotiations between members of the organisation. This is what I observed during my data collection activities.

It should be noted that the company I work for, and offshore contractors in general, encourage personnel to perform safety observations, which involves practical observations on the job site, in order to enable crewmembers to scrutinise safe and unsafe acts, with the intention of reinforcing the former and stopping the latter. The fact that this monitoring process was already in place and being carried out by crewmembers certainly helped me during my fieldwork, as the working community was already accustomed to being observed while performing their daily activities, and therefore did not feel uncomfortable as a result of my structured observations.

> ➢ Second objective: Safety Culture

During my observations schedule, I was also interested in examining the safety culture on board the offshore installation, which is defined as follows:

"A belief, philosophy or faith held by groups or individuals on safety matters which is demonstrated in practice through the attitudes, actions and behaviour adopted by the people of an organisation or a nation." (Kuo 2007)

The structured observation table prompted me to observe indicators of safe working practice, hazard identification, risk assessment and controls. I was then able to qualitatively record the risk behaviour type. The table below captures the key points and gives some examples. I coded the behaviour types into five categories, from 1B to 5B (Appendix G)

BEHAVIOUR TYPE	Example
Risk Producing	Improper Lifting
Mitigating	Wearing all PPE
Procedural	Following procedures, plan, risk assessment
Supportive	Reporting accidents
Safety Leadership	Acknowledging safe behaviour

Table 4: Behaviour types, adapted from Cooper 2002

My strategy in the field was simple. I asked the participants for permission to perform observations, which is also what the company requires when using the monitoring process mentioned earlier. When possible, I also engaged in a conversation with the participants prior to the observation, which served as an ice-breaking tool. The way the various teams were composed and the way they performed the different jobs and tasks gave me invaluable data and insights into the behaviour of this working community. For example, I observed in most of the activities very low grid and high group indices, which suggests a particular "way of life" or category, according to Douglas's theory.

On a few occasions, I was involved in the activities I was observing and thus fulfilled completely the role of participant observer. I was involved in the activity and at the same time recording observations. In this role, I gained a lot of insights and gathered valuable data. In most of the observations, if not in all, at least two different nationalities of participants were involved.

My observational agenda was quite simple. During the operational morning meeting we discussed the upcoming daily activities and therefore I was well aware of the various activities that were taking place on board the installation.

The next step was to decide what activity I wanted to observe. I always chose an activity which involved more than one person, as I was interested in observing interactions within the multicultural crew. My interaction with the crew as participant observer was at the beginning of the observation, when I asked permission to perform my observation. I was very visible but I mainly stood back and observed the operation. Often I felt that I became almost invisible and a part of the working environment and I believe that after a while my presence did not interfere with the actions that were taking place.

I became an active participant again only if I observed an unsafe act. In this case an ethical issue was involved in that it was my duty to avoid any possible injury to any member of the crew, which is also what I would like to achieve with this work-based research. However, on most occasions, my participation was limited to ask permission to observe, observing the work activity taking place, and discussing it with the crew, if appropriate, to give feedback about what I had observed.

During the observations, I noticed that a particular safety tool was used quite often, the so-called "Time Out For Safety" or TOFS.

The company recently organised training courses ashore to reaffirm the basic company health and safety policies. During these, TOFS was explained in full. It was emphasised that the executive management wanted to empower everyone to stop unsafe acts in order to prevent incidents.

I found this expectation to be a very egalitarian way of conducting business. During these meetings ashore it was stressed that everybody had the right to call a TOFS if something did not look right. This encompasses the entire set of operations performed on board. For instance, a member of the maintenance team can stop the drilling activities if he or she thinks they are unsafe. Managers present at these meetings reiterated that everybody has the right to stop a job. Even if, after halting the operation, it is found to be safe, TOFS is

still considered to be good practice as it shows a commitment to safety. This tool empowers every employee to stop any operation when appropriate. It is a very powerful tool in an egalitarian society.

I would like to relate a critical incident that occurred during my fieldwork activity, when I had to deal with a very angry electrician. He tried to stop a job by calling a TOFS, but apparently his instructions were not immediately followed. He became very angry with the team performing the task as he felt it was unsafe. He then complained to his supervisor and eventually the matter was brought to my attention. I decided to call the relevant parties to a meeting to clarify exactly what had happened.

The story was as follows. The electrician saw a container being lifted by the main crane and he felt that the operation was unsafe as the load was swinging due to the ship's motion. He called the TOFS but the crane operator did not stop the action. The electrician tried a few more times to stop the activity and finally the crane operator landed the container on the main deck. The electrician was very angry because he had been told on several occasions that he had the right to stop any job, but the crane operator had apparently ignored him or at least this was the electrician's perception. The two were of different nationalities.

Once I had the crane operator and the electrician together, I asked the crane operator his version of the story. He said that what the electrician articulated was correct; however, he was committed to lowering the container onto the deck and could not stop, as the load would have swung even more. To clarify the matter I then asked both of them if we could use the metaphor of an airplane taking off, that is, once the pilot is committed to lifting it off the ground, he cannot stop the aircraft as there is a so-called "point of no return". Both of them agreed with this example and the issue was finally resolved there, as they understood each other's position and perception of the event. However, this episode made me reflect on the idea of empowering the workforce to stop any operation they *perceive* to be unsafe. In this case the electrician was probably experiencing a cognitive dissonance between what he had been told and what was actually happening. This episode suggests that an egalitarian style is present in the working community, but it also shows the downside of putting into practice a safety model that permits and encourages everybody to stop operations as they see fit.

The data I collected enabled me to develop an original approach to safety which I will elaborate on in detail in the next chapter. The originality of these observations is to bring

cultural theories into a working arena, which in turn has helped me to understand the organisational culture.

> ### 4.2.2 Activity 2: Interviews

I found this activity to be very interesting and stimulating because it enabled me to engage in in-depth, content-focused conversations with the working community. During this activity, I collected data from fourteen persons through in-depth semi-structured interviews (see Appendix B for the interview guideline)

While engaged in this activity, I stressed one important point, which was that I was acting in my role as researcher and not as the ship's Captain. I made this point very clear when I approached the potential participants, explaining in depth my goals and emphasising that I was engaged in work-based research, and that in this role I was asking their permission to carry out the interview. I provided them with the participant information sheet (Appendix E) and at the same time I explained the aims of my research.

I must add that the very nature of ship life creates a natural bond among the crew, and this is also true on an offshore installation such as a drillship. In this particular instance, I was fortunate to have spent a considerable amount of time with most of the crew during the construction and commissioning phases of the drillship in South Korea. I had a very good relationship with many of the crewmembers, although I was not familiar with all of them. In addition, I have spent a significant amount of time off the ship on training courses, again with many of the crewmembers, and this has helped to create a comfortable atmosphere between us. Thus, the familiarity between myself and many of the members of the working community helped me to create an ideal environment for many of the interviews, as I fitted into the classic role of participant observer.

Operational issue

I had the operational issue of needing to find a suitable way to record the interviews. One of the choices was to use a voice recorder to tape them. The advantage of this technique is that it allows the researcher to concentrate on the interview and keep the interviewee at ease. The clear disadvantage is that it requires a large amount of material to be transcribed later. In addition, a tape recorder can make participants feel uncomfortable in many cases. I thus decided not to use a tape recorder. I found I was able to concentrate on the topic and keep the interviewee at ease while making notes on their answers in a paper notebook. Writing these notes down helped me to remember better what had been discussed. At the end of the interviews, I took the notes and entered them into a formatted

electronic document that I saved on my computer. I made backups to ensure that the data was not lost or damaged, especially as I was travelling extensively and my portable computer could easily have been damaged.

During the semi-structured interviews, a two-way conversation allowed the interviewees to express their opinions, concerns and feelings. The fact that the interviews were semi-structured allowed the conversation to flow where it needed to in order to deal with the issues at hand, as opposed to cutting the conversation off if it strayed too far from the topic.

Every time I approached an individual to ask them to take part in an in-depth interview, I spent some time engaging in an ice-breaking conversation in order to make them feel at ease. In addition, I decided to visit the participants in their own workplace, as I realised that they would feel more comfortable there than they would in my office, for example, as it is a formal location. I went to different locations on the ship to meet people from different departments. This was not seen as a threatening act as I customarily make rounds of the ship on a daily basis and the crew is used to seeing me outside my office frequently.

I selected possible participants from my sampling target beforehand. I then approached them and greeted them and engaged in the ice-breaking conversation. I always asked if the individual was busy, and if that was the case I told them that I would like to have a chat with them at a more convenient time, emphasising that this did not involve a disciplinary or performance-related reprimand, but was about some research I was conducting. This happened on a few occasions, and I always went back to visit the individual again or waited for the individual to let me know when he was available. I used this approach in order to show them that the interview was not in any way an order or an instruction from me; they could wait until later or refuse, if they so wished. However, if the participant was not busy and I had the chance to talk to them immediately, I explained once again that I was talking not as the Master of the ship but rather as a researcher. I explained that I was carrying out a piece of work-based research and asked them to imagine for a moment that we were off the ship and having a conversation on a train or in a pub. I noticed that this approach helped a lot, as the individuals tended to feel more at ease when thinking in this context. I then handed over the research participant sheet (Appendix E) and, at the same time, explained in my own words my research aims and my objective in collecting data. I also emphasised that the conversation was completely anonymous and that there would be no mention of name, position or any other acronym that could reveal their identity. On all fourteen occasions I found the participants willing to help.

Once the participant had agreed to the interview, I asked their permission to take notes and thanked them for their participation in my research, emphasising once more that this would remain confidential. I noticed that metaphorically stepping down from my position as Master and wearing my researcher's hat made the participant at ease. Even though I noticed that some junior members were a bit uncomfortable, they still gave their opinions. I believe that the choice of interviewing them in their own workplace made them feel comfortable and drew an honest dialogue from them, giving me the opportunity to explore concepts such as hazard identification and risk assessment in a deeper way. The more interviews I held, the more confident I became, and by the end of the process it had become easy to approach a participant and start an interview. Although it is a large ship, I saw the participants on many occasions after the interviews and participant G became especially interested in my research topic. We engaged in discussions that helped me to reflect on my project and I captured many of these thoughts in my research diary.

Between the five focus groups and the fourteen in-depth interviews, I dialogued with participants of ten different nationalities, which I consider to be a very multinational and multicultural sample group. The language used was English, and although this was not the first language for many of the participants or for me, our knowledge was more than enough to engage in conversation on topics related to our profession. In addition, as the official company language is English, there is a minimum proficiency standard that has to be met by all employees. Therefore, I found that language was not a barrier.

Figure 8: Researcher's interaction with different nationalities during the data collection

➤ 4.2.3 Activity 3: Focus Groups

In my fieldwork activities I have used a multiplicity of data collection techniques and this has helped me not only to merely gather data but also to register observations, feeling and shared belief of the working community. One of the data collection techniques used in the work-based project was the Focus Group.

Suter (2000) highlights that "the main difference between participant observation and focus groups is that the former observes behaviour in its natural setting, while the latter observes behaviour in unnatural social settings". However I found focus groups to be an appropriate data collection strategy, and one which complemented the in-depth interviews and participant observations quite well. Unlike other methods of data collection, the focus groups were conversational and this facilitated the gathering of information.

I conducted five focus groups with between three and ten participants each, making a total of 25 respondents. Although in general it is not easy to organise focus groups, I found that being on board an offshore installation 24 hours a day for a month at a time made this logistically easier than it might be in a different, and perhaps more conventional, working environment.

For the focus group sessions, I used the same semi-structured interview sheet (Appendix B) that I used for the in-depth interviews. My major objective for the meetings was thus clearly identified beforehand. I had a very basic agenda: I welcomed the participants, reviewed the agenda, reviewed the goal of the meeting, took questions and answers, wrapped up and said a final thank you to the participants.

Focus groups are basically multiple interviews so I approached the group as if I was holding an interview. I explained in detail the aim and objective of my research, and handed out participant information sheets. I also stressed that I was acting as a work-based researcher and not as the shipmaster. Moreover, I ensured that the group understood that there were no right or wrong answers, but that I was looking for honest feedback which would, in turn, help my research.

The focus groups varied in size as I approached the participants individually to ask if they were willing to participate, to explain the research context and to provide them with a participant information sheet (Appendix E).

One technique that I used on two occasions was to hold focus groups at the end of the ship's safety meetings, asking permission to carry out a series of questions to people who wanted to participate. On board offshore installations it is the norm to hold weekly safety meetings. This is a consolidated routine carried out worldwide. The crew is accustomed to these meetings and I found that this method worked quite well. The participants had already been participating in a meeting about safety and they felt at ease answering questions on the same topic. I felt that this helped them not to feel threatened or uncomfortable. I believe that this approach helped me to obtain honest and reliable data.

Again, I emphasised that participation was completely anonymous; there would be no mentions of names or other cronyisms that would identify a participant.

I took notes but at the same time I was actively listening so that the participants would feel that I was interested in their answers.

I worded each question carefully. I was afraid that because of the multinational nature of the groups there could have been communication problems but this turned out not to be an issue. I read the questions out loud, but then I expressed the same concept in different words, to ensure that the message was clear.

I also ensured that there was even participation amongst the group. If one or two persons were dominating, I ensured that others had the chance to speak too.

On another occasion I gathered the participants in an office space close to the navigational bridge. In this particular instance the participants were of three different nationalities. This was my third focus group and I had also held about thirteen interviews by this point so I was quite confident in controlling and managing the group. I had very good feedback from the participants, and I was able to engage them in a very stimulating and informative meeting. I registered their points of view with regards to the main objectives of the meeting. After this focus group, I started to anticipate and was almost able to guess the participants' answers. This indicated to me that I was gaining a very good insight into the working community. I began to understand their feelings about the safety management systems much more clearly.

My fourth focus group was carried out in a similar mode to the previous one. Again I used the office space next to the navigational bridge, inviting three participants of different nationalities. I was able to engage them in a quite relaxed conversation. One participant was very keen and expressed his point of view very effectively. I also gathered a very

good, and may I say, honest response from this group and I appreciated the way they expressed their own points of view, avoiding technical jargon and over-used "buzz words".

My fifth focus group was slightly different from the previous ones. Unfortunately, a young man had lost his life on a company drilling ship working in the same region as we were, again a victim of a so-called "routine job". The 26-year-old man was crushed against a post by a heavy lift being moved by the main crane. The emergency helicopter was called in and immediately evacuated the injured person, but sadly he was already deceased when he arrived at the hospital. The fatality happened on a very similar, although older, drillship to ours.

Shortly after the incident, we received a visit from upper management and a meeting was held at which the incident was discussed. We also received video messages from the corporate office in which top executives emphasised the workforce's accountability for safety and stated that it was not acceptable for incidents to occur. All of the above suggested very heavy "top down" instructions. In other words, the executive management was saying "do not get hurt".

The focus group that was carried out just after the above incident include ten people of five different nationalities. I started by discussing the fatality. I asked if the messages we had received made any difference at all to them and to their daily operations. The group agreed that a top-down instruction was not effective, and that a bottom-up drive coming directly from the workforce was necessary. In facilitating this focus group I followed the agenda I had set for the previous ones. I gained valid data from this larger group of participants who were all involved in the discussion and had strong feelings about the above incident. In this meeting I felt there was a strong group involvement, and that suddenly the safety talks had become tragically real. A life had been lost and discussing hazard identifications and risk assessments was no longer just an abstract exercise but rather a process that could affect real life. One participant shared a personal experience about an incident he was involved in a few years previously. He attributed it to a lack of attention on his last day at work before his time off. In the light of this experience he urged other participants to be focused at all times while carrying out their work. In brief, in this focus group there was a lot of emotion and involvement, It was in some ways much more informal than other meetings but on the other hand it gave me some invaluable insights into the ship's safety culture.

➤ **4.2.4 Activity 4: Research Diary**

The research diary captured my reflections and observations from my data collection activities but also from my professional practice in the offshore environment. Keeping a written record of my research certainly enhanced and developed the depth of my engagement in the project. I recorded conversations with peers, subordinates and upper management which were relevant to my research. I did, however, ensure that the ethical conduct already detailed extensively in Chapter 2 was followed at all times. I never mentioned names or used any other means of identification.

In a way, I used the research diary to supplement the interview data and to record a rich level of information about the respondents' behaviour and experiences, almost on a daily basis. In addition, the diary helped me to draw a metaphoric map of my research pathway that enabled me to stay focused on the aim of my project.

I made regular entries during the fieldwork activities. The diary was an invaluable aid for recording hints and insights, progress, feelings and for developing original thinking and capturing my reflections as they emerged from the project activity.
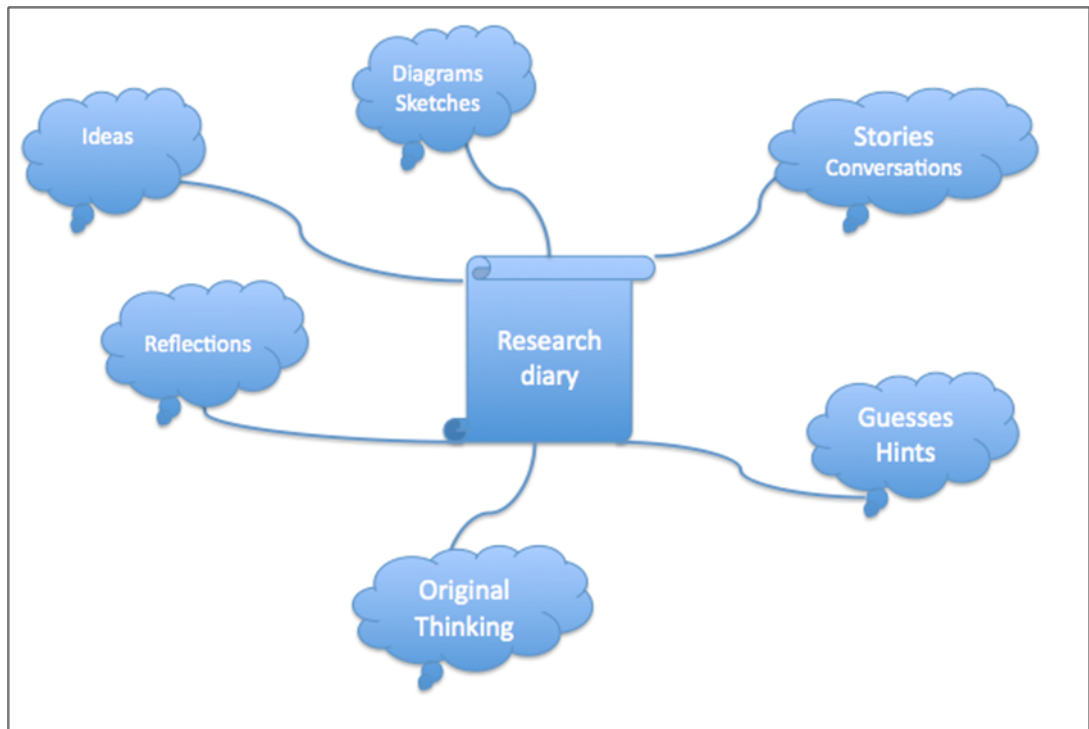
Figure 9: Graphical representation of my research diary

Although one school of thoughts recommends restricting the research diary to observational notes, methodological notes and analytical memos (Blaxter *et al.* 2001), I

wrote my diary without using such a structured scheme. I used a free-text diary as opposed to the "structured" type.

I wrote the diary regularly during the fieldwork. I always kept in my pocket a small notebook in which I briefly noted ideas, observations, hints or anything that caught my attention or that was related to the project. This was an easy and quick method of capture that I was able to expand on later in an electronic diary that I kept on my personal computer.

I founded this strategy very useful. It was not really feasible to bring the computer into the various working areas of the ship during my data collection activity, but using the notebook allowed me to make rough notes immediately while in the field. I also used the same notebook to draw graphs and sketches that helped me to visualise the data, and some of these graphical representations were also captured electronically later and are used in this report.

There were very few days of fieldwork activity on which I did not write something in the diary, and if I had not made an entry for two days or more, I forced myself to write something anyway even if I felt that I was not moving forward with the data collection. I feel that it was important to keep the entries flowing and, although I may have sometimes held the impression that I was moving at a slow pace, I was able to put in writing certain reflections that helped me at a later stage. Often a sketch helped me to gather ideas together and make sense of what I was doing in my ethnographic investigation. I found it very helpful to visualise what I was doing or what I was trying to achieve with the project in graphical form.

The length of the entries varied from day to day. Often I wrote only a sentence but sometimes pages.

I did not prepare forms to fill in, but recorded the date of the entry and then used a simple style, frequently with a heading to summarise the event. I mainly recounted conversations that were not formal in-depth interviews, but in some cases I also entered my reflections on the interviews and observations. I also found it interesting to keep a record of topics and questions for further study that emerged from this investigation.

Certainly the diary acted as a regular writing practice that forced me, in some way, to form and develop original thinking, as I expressed earlier, about my project, but it also helped me with reflecting-in-action (Schön 1991) regarding my own research and development.

4.3 Consideration of my role as Master

Throughout my research I was very aware of my position of Master and its possible impact on the validity of the data collection. I paid particular attention to this aspect when I was at the planning stage of my project. I highlighted very carefully the ethical implications of my role as a work-based researcher who was also in command of the ship. I planned the data collection phase carefully because I wanted to ensure that my position would not impact the validity, especially during the observations and interviews.

For the data collection stage of my research, I used the informed consent approach (Davies 2008) to ensure that the participants were aware of my research, what it was about, why it was being undertaken and how it would be disseminated. I used the participant information sheet (Appendix E) for this purpose. However, the sheet also gave me the opportunity to explain very clearly that in the research context I was not acting as Master, but rather as a researcher involved in a work-based project. During the interviews I endeavoured to ensure that my position as Master had as little impact as possible, if any, on the data collection process, making certain that the participants understood that I was acting as a researcher and not as the ship's Captain. I made this point crystal clear when I approached the potential participants to seek their permission for the interviews, also explaining in depth my goals and emphasising that I was engaged in work-based research.

One important point about the observation process, however, needs to be highlighted. I want to emphasise, again, that nowadays the crews of offshore installations are used to being the subject of safety observations performed by colleagues, supervisors and management. The observations are treated as strictly anonymous. There is no mention of names or positions on the observations cards used in the industry. Further to this, I asked permission from the participants and explained that the observations would be used as data for my project. The ongoing industry practice of safety observations certainly helped me during my data collection. Because of the crew's familiarity with this process my presence on site was considered normal.

Moreover, I was fortunate to have spent a considerable amount of time with most of my crew during the construction and commissioning phases of the drillship in South Korea. Whilst the drillship was in construction in the Korean shipyard, we were all living ashore in the same building. After working hours we met regularly in a social atmosphere and this acquaintance helped me to create good relationships with many of the crewmembers. I have also spent a significant amount of time off the ship on training courses in different

countries, again with many of the same crewmembers, and this experience also contributed to building relaxed relationships, which has lessened the impact of my position as Master on the validity of the data collection. While I was holding the interviews, I used different strategies to reduce or eliminate the impact of my position. First of all, I decided that when approaching an individual to ask them to participate, I would spend some time engaging in an ice-breaking conversation in order to make him feel at ease. Also, as explained earlier, I decided to visit the participants in their own workplaces. I noticed that this approach was very beneficial as they seemed to feel much more comfortable in their own environment than they did in my office, which is a more formal place. I ensured that they were at ease with me and that they understood that I was metaphorically stepping down from my rank as Master and positioning myself in a work-based research context. The project context was well defined by the participant information sheet (Appendix E). This explicitly explains the potential benefits of the research, that is, improving the safety of offshore operations, that participants could withdraw voluntarily from the research at any time and that their data would be treated as strictly confidential.

4.4 Conclusion

In this chapter I have provided details of how I put into practice the research approach and data collection techniques designed in the previous chapter.

I was able to gather qualitative data with the use of an ethnographic research approach. The fieldwork activity is the backbone of this project and the graphical representation below shows the strategy I used to collect coherent data. In the next chapter I will analyse these data extensively.
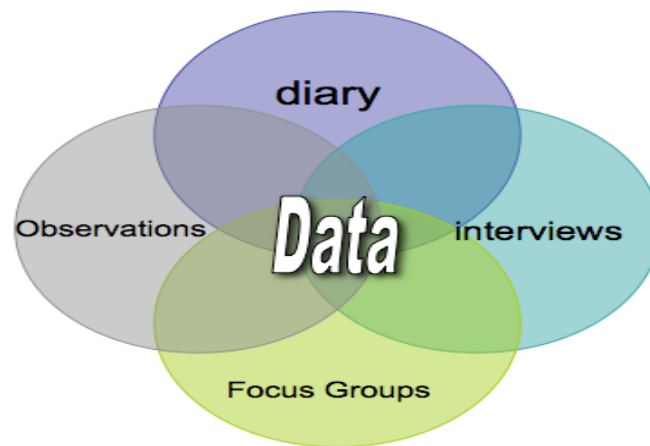
Figure 10: Data collection techniques

C H A P T E R   5

PROJECT FINDINGS

5.0 Introduction

In this chapter I discuss, critically analyse and interpret the findings of my work-based research. My ethnographic approach and role as participant observer throughout the project provided a framework for data collection that enabled me to record patterns of thoughts and behaviours.

Specifically, I critically discuss the understanding of safety systems and perceptions of risk among the multicultural workforce on board the ship. I consider and interpret key themes about cultural bias in perceptions of health and safety (H&S) issues, shared values and risk perceptions emerging from the data analysis.

The data I collected on the multicultural crew's attitudes to risk are modelled into behavioural attitudes and analysed using qualitative techniques and the two dimensions of cultural theory (Douglas 1990) referred to in Chapter 2. The values gathered along the two dimensions of cultural theory, namely grid and group, provide a view of the multicultural workforce's specific way of life.

In addition the data gathered from the interviews, focus groups, observations and in my research diary over the four-month period are triangulated to ensure reliability and validity.

Finally, the concept of "cross-cultural safety consciousness" is developed, based on the cultural dispositions and shared values of the working community.

My objective in this chapter is thus to evaluate and organise the data gathered during the ethnographic investigation, interpret them, and present them in a meaningful way, and most importantly, in a way which will contribute to policy formation and good practice in the international seafaring sector.

5.1 Data Analysis

Data analysis in any ethnographic research is a challenging task and is often defined as the 'art' of processing the gathered information. Fetterman (1998:93) points out that "first and foremost, analysis is a test of the ethnographer's ability to think – to process information meaningfully and usefully". O'Reily (2005:184) expresses the same concept with this comment: "But what do I mean by analysis? By this I mean *making some sense of it all*." This implies an intellectual and methodological process of ordering the materials in a way in which their implicit and explicit meanings and connections are revealed.

I used content analysis (Krippendorff 2004) to process the data. Fraenkel and Wallen (2009) propose the following definition of the method: "Content Analysis is a technique that enables researchers to study human behaviour in an indirect way, through an analysis of their communications" (p.472). Because this methodology implies the analysis of written accounts of communication, I used it to process the transcripts of the interviews and focus groups. I analysed and interpreted the data with the aim of explaining the meaning of my findings through a systematic analysis of their content. Content analysis enabled me to include textual information and systematically identify its properties by detecting the more important structures of its contents. I coded and broke down the transcripts of my interviews into manageable categories on a variety of levels, such as word, word sense, phrase, sentence and theme.

When collecting the data in the interviews and focus groups, I set a framework of themes to be explored in a two-way communication process. This allowed the respondents the time and scope to talk about a specific subject. The transcripts were therefore analysed using five different themes:

- ➢ Concept of safety
- ➢ Hazard identification
- ➢ Risk assessment
- ➢ Understanding of safety system
- ➢ Accountability for health and safety

To analyse these data, the themes were coded manually. Content analysis assumes that words and phrases that are mentioned often are important and reflect significant concerns. Using conceptual analysis (Fraenkel & Wallen 2000) within the content analysis framework, I established the existence and frequency of concepts related to the above

themes in a given text. Once established, the concept was then explored and the number of occurrences within the text recorded. This strategy enabled me to analyse, highlight and cross-refer concepts in a way which corresponded to the qualitative methodology I chose to use.

Interview Question:
"What do you understand by the word "Safety"?

Interview Answer	Respondent	C
For me Safety means awareness	A	
For me safety is a "safe" job for me and and my co-workers.	B	
A safe job for self and others	C	
Not getting **hurt**	D	C
The First Rule	E	
Not getting **hurt**	F	
The first thing that sprung in my mind, is not getting **hurt**	G	
When I feel "comfortable" with the environment	H	
For me safety means when I can go back to my family without **injury**	I	
For me Safety is a tool that enable us to **protect ourselves**, the property and the environment	L	

Figure 11: A fragment of a coded transcript

Figure 11 shows a fragment of a coded transcript used for the content analysis of the data collected through the interviews. In this transcript example I was able to establish the existence of a recurrent topic and record its frequency.

In this instance I found a common pattern among the respondents, the data gathered and analysed for its specific qualitative implications was then triangulated by means of series of focus groups, observations and research diary.

5.2 Presentation of Findings

In the following paragraphs, I consider the key themes that have emerged from my ethnographic investigation of the interaction between the multicultural crew and the safety management system on board a drillship in the offshore oil industry. I present my findings about the risk perceptions and understanding of the safety system among the crew. I follow this with the empirical application of cultural theory and the risk behaviour typology of the working community under study.

The investigation revealed an uncharacteristic perception of what is considered to be a 'safe job' by this working community. The community of practice indeed perceives this concept quite differently from what the company has set out in its policies and procedures. The expectation of the crew, in terms of safety performance, is certainly close to "zero incidents", although the perception of how the risks should be controlled is quite different from what the company has clearly stated in its health and safety regime.

Cultural biases play a role in this offshore community and this is evident from the values obtained along the two dimensions of cultural theory, which empirically demonstrate that a specific way of life is present in the working community under study.

5.2.1 Perceptions of risk and the understanding of safety for the multicultural workforce

Data on perceptions of risk and the understanding of the safety system among the crew were gathered through interviews, focus groups, observations and my research diary and then critically analysed.

During the data collection phase, in my role as participant observer, I was able to interact with crewmembers of many different nationalities. I interviewed a total of fourteen individuals, descriptions of whom are given in the following table.

Participant	Nationality	Years Experience	Department	Supervisor
A	Indian	7	Maintenance	No
B	Indian	2	Operation/Drilling	No
C	Indian	6	Maintenance	No
D	Indian	6	Operation/Drilling	No
E	Filipino	2	Maintenance	No
F	South African	20	Operation/Marine	Yes
G	Polish	8	Operation/Marine	Yes
H	Polish	9	Maintenance	Yes
I	Brazilian	15	Maintenance	Yes
L	Indian	7	Operation/Drilling	No
M	Angolan	14	Operation/Drilling	Yes
N	Trinidadian	9	Operation/Deck	Yes
O	Malaysian	9	Maintenance	Yes
P	Indian	1	Operation/Deck	No

Table 5.0 Participants in the in-depth interviews

The interviewees were selected using the process described in Chapter 3. The target group was employees of different nationalities with at least one year of experience in the industry, representative of the multicultural crew present on board the offshore installation. Participant P was the youngest interviewee. He was in his late twenties with one year of experience working in a non-supervisory capacity, employed in the deck department. At the other extreme, the most experienced interviewee was participant F, who was in his mid-forties, with twenty years of experience and working in a supervisory position in the marine department. The combined number of years of experience of the interviewees was 115. This is an impressive number that represents a wealth of practice and exposure to the offshore environment.

In addition to the interviews, I carried out five focus groups on board the offshore installation, as detailed in Chapter 4, involving 25 participants. Details are given in Table 5.1.

Focus Group Number	Number of Participants	Nationalities represented
1	3	Indian
2	3	Indian
3	8	Croatian, Filipino, Polish, Indian, South African
4	3	Croatian, Polish, Indian
5	8	Polish, Indian, Canadian, Filipino, Australian
	Total: 25	

Table 5.1 Participants in the Focus Groups

Three of the focus groups included only three individuals each and two included eight. The first two focus groups involved only Indians with non-supervisory roles. However, many different nationalities were involved in the other three focus groups, namely, Indian, Croatian, Filipino, Polish, South African, Australian and Canadian.

First of all, I analysed how the concepts of safety and risk were discussed in both the interviews and the focus groups. I transcribed the answers to each question into a spreadsheet, which made it easy to find words and concepts expressed by the participants.

The interviews and focus group activities revealed that many of the crewmembers and officers associate injury and harm with the concept of "safety". The content analysis revealed that terms such as "hurt" or "getting hurt" were explicitly mentioned by the participants.

Participant D, in one of the in-depth interviews, defined safety as:

"*not getting hurt*".

Participant F, almost identically, stated that:

"*for me safety means not getting hurt, avoid the hazards and risks*".

Interviewee G reported that:

"*the first thing that sprung in my mind when I think about safety, is not getting hurt*".

Participant I's definition of safety was:

"*Safety is to go back to my family without injury*".

Participant H, a Polish national with a supervisory role in the technical team and nine years of experience, reported that:

"*For me safety is when I feel 'comfortable' with the environment around me. This perception helps me to understand if I am safe or not. I tend to eliminate all the hazards when I start a job, to reach the "comfortable" status.*"

The data gathered through the focus groups involving a total of 25 persons as detailed in table 5.1 supported the views expressed by the interviewees. Concepts such as "*not getting hurt*", "*no injury*", "*protect yourself and the property*" were recorded during the discussions about the concept of 'safety'.

Some confusion emerged, however, between the concepts of 'hazard identification' and 'risk assessment'. To reiterate, the definitions of these two terms, proposed in Chapter 2 are that a *hazard* is a situation with the potential to lead to harm, and a *risk* is the probability of harm being realised. Kuo (2007:101) defines a hazard as "something that can lead to undesired outcomes or harm in the process of meeting an objective". Douglas (1992:31) defines the concept of *risk* as follows: "a risk is not only the probability of an event but also the probable magnitude of its outcome". Kuo (2007:273) pragmatically defines a risk as "a measure of a hazard's significance involving simultaneous

examination of its consequence or severity of the outcome and the probability of occurrence".

From the data, there emerged some confusion and lack of understanding of the difference between a 'risk' and a 'hazard'. It is important to differentiate between the two terms, which were often used synonymously by the participants in this research. This is quite an important finding, because knowledge of these two concepts is the basis for an effective safety management system. In an effective system, the process of hazard identification comes first, followed by the risk analysis, which measures the hazard significance based on the consequences of its outcome and the probability of its occurrence.

Nearly all of the participants in the interviews and the focus groups were unable to clearly define a hazard.

Interviewee I's definition was:

"*the hazard is the 'unknown' and can be everywhere",*

while participant O proposed that:

"*hazard and risk is the same thing*".

Only a few participants were able to explain broadly what a hazard is. The closest definition came from participant E, who proposed that:

 "*a hazard is something with the potential to hurt you*".

The data gathered from the interviews was triangulated with that from the focus groups to strengthen the validity of the findings. Together they revealed a lack of understanding about the concept of a *hazard*. Three of the focus groups, containing a total of fourteen people, were not able to define what a hazard is. One of the groups defined it as "*something that can injure you"* and another as "*the potential to damage humans, environment and property".*

Marine safety management systems (Kuo 2007) are based on a theoretical framework which assumes the ability to identify the hazards. This is the basis for effective risk assessments. It is evident that if a hazard is not identified, or worse, not understood, it will be impossible to reduce the risk associated with it from an intolerable to a tolerable level. Figure 12 below demonstrates how the process works.

Later on this chapter, I show that the data from the observations highlight a high number of risk-producing behaviours/determinants and that this data is consistent with a lack of hazard identification.

In general, this working community does not show a clear understanding of the concept of a hazard. This lack of comprehension undoubtedly effects the perception of risk.
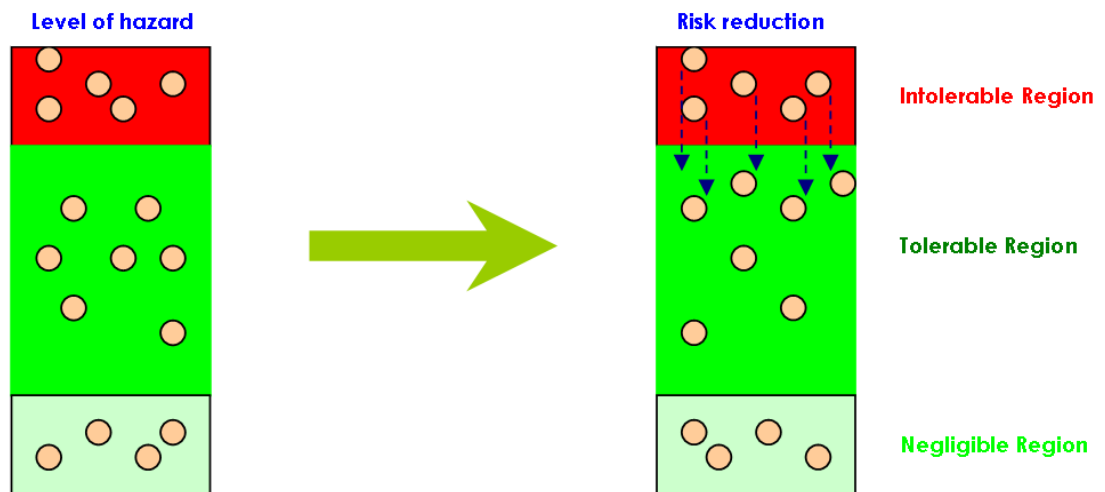
Figure 12: Pictorial representation of risk reduction (source: Kuo 2007)

Figure 12 demonstrates the importance of hazard identification as a first step in reducing risk, which is the probability of an event occurring and the probable magnitude of its outcome. When the hazard is in the "intolerable region", its associated risk must be reduced to move it into the green zone, which represent the "tolerable region". As a practical example, if a person is working at a height of above three metres, the hazard of falling and its associated risk are defined as intolerable. Using personal protective equipment, an inspected portable ladder, and a safety harness with an inertial reel connected to a solid anchor point directly above the worker, can reduce the risk to a tolerable level. Firstly, it is necessary to understand the hazard and then, if applicable, reduce the associated risk to a tolerable level.

Remarkably, to the question "What type of Risk is acceptable for you, and why?" almost every participant answered "*zero risk*". The following are some of the responses given during the fieldwork:

"*there is no acceptable risk*"

"zero risk is the goal. I am not willing to take any risk"

"for me is acceptable no risk, zero risk"

"Zero risk in a perfect world"

Nearly all the participants expressed a desire to work in a zero risk environment.

This collective and homogeneous representation of risks surely illustrates the shared values and beliefs of this community. Douglas (1995) emphasises that the cultural relativity of hazard perception is an instrument for the maintenance of group solidarity. Each of the four groups in Douglas's cultural theory framework, individualist, egalitarian, hierarchist and fatalist, is characterised as being culturally biased according to the ways in which their social commitments towards a preferred 'way of life' predispose them to adopt a particular view of society.

One interesting view expressed by interviewee Q was as follows:

"For me safety is working without hazard to complete the job".

Although this answer echoes the views mentioned earlier and illustrates the same shared values and beliefs, it also reveals an implicit contradiction in terms within the research context. The contradiction I am referring to relates to risk management. Although working without hazard would be theoretically possible, in an industrial environment hazards are virtually always present and the risks associated with them need to be dealt with. The answer given by this participant unveiled an understanding of the 'safety systems' which tend towards the 'zero risk' philosophy. In other words, the risk is not dealt with but eliminated altogether.

According to Ball (2000), there are eight different concepts of safety. At one end of the spectrum is the "zero risk" approach and at the opposite end, the pragmatic ALARP (As Low As Reasonably Practicable) method, which, as the acronym suggests, does not necessarily eliminate the risk or reduce it to "zero". Instead it reduces the risk from an intolerable to a tolerable level.

The bias of a working community towards a "zero risk" philosophy is associated, in cultural theory terms (Douglas 1990), with an egalitarian world view, as opposed to the low risk perceptions typical of individualists and hierarchists.

Egalitarians are characterised by their commitment towards a lifestyle that esteems the ideals of a safe environment (Wilkinson 2001), in which people live together according to

their chosen principles. (Douglas 2005).

Safety criterion	Zero risk	Safety targets	Standards, CoPs and guidance	Absolute risk	Risk factors	Risk assessment	Cost-benefit analysis	Risk tolerability and ALARP
Typical adherents	Pressure groups	National and international agencies. Major industries	Traditional industries, lower courts, accident investigators	Actuaries and natural scientists	Epidemiologists and health scientists	Safety engineers and applied scientists	Economists	Higher courts, regulatory bodies, international agencies and major industries
Basis of approach	Commitment	Political desire	Expert judgement	Historical data	Evidence	Scientific simulation	Utility theory	Case law (in the UK)
Strengths	Simplicity, single-mindedness	Clarity of overall policy goal	Should reflect a broad swathe of expert opinion. Tested over time	Enables insurance companies to set premia	Scientific basis	Analytical tool. Ability to forecast the unknown	Considers both costs and benefits of safety measures	Considers wider implications of safety measures including cost, practicality etc
Limitations	Associated benefits foregone. Cost of control disregarded	Top down approach which may be inconsistent with the sum total of individual safety interventions	Validity and motivation of judgements unclear. A bottom up approach which may be inconsistent with policy goals	Other social priorities are disregarded	Uncertainties, causality, and the question of 'how safe is safe enough?'	Uncertainties in assumptions, probabilities and dose-response functions	Anchored in a particular philosophy. Hidden assumptions and methodological problems, particularly in valuing benefits	Difficulty of striking a balance between competing attributes of a decision
Examples	'Vision Zero', hand gun control, machinery guards, food additives	Injury targets. Air quality guidelines. Sustainability	Product safety standards. Workplace CoPs. Numerous personal injury court cases	Simple comparison of risks from different activities	Public exposure to radon and air pollution, playground safety	Occupational safety assessment	Railway and offshore safety investment decisions and major hazard control	Major hazard control, strategic planning applications

Table 5.2: Eight different concepts of 'safety' (source: Ball 2000)

5.2.2   The Zero Risk approach

The perception of the working community towards a "zero risk", however, also suggests also that there is a lack of knowledge about company policies and procedures, which clearly and explicitly stipulated that the risk must be reduced according to the ALARP method, As Low As Reasonably Practicable. The Table 5.1 above graphically explains the eight concepts of safety, with the zero risk and the ALARP method are lying at two extremes of the range proposed by Ball (2000).

Typical adherents to the zero risk approach are, for instance, pressure groups who aim to influence policy makers and force them to disregard costs completely. To give a practical example, the US Occupational Safety Health Act, 1987, stipulated that a formaldehyde standard would be established, at an estimated cost of $72 billion for each life expected to be saved (Viscusi 1996). This example of a zero risk approach was undoubtedly politically driven, incurring huge costs compared to the associated benefits, and reflects the

egalitarian view which puts a high emphasis on low risks combined with high consequences, without any formal cost-benefit analysis.

5.2.3 The ALARP approach

ALARP is a pragmatic approach to safety that was introduced by the UK Health and Safety Executive (HSE 1992-1). It is illustrated in Figure 13 below.
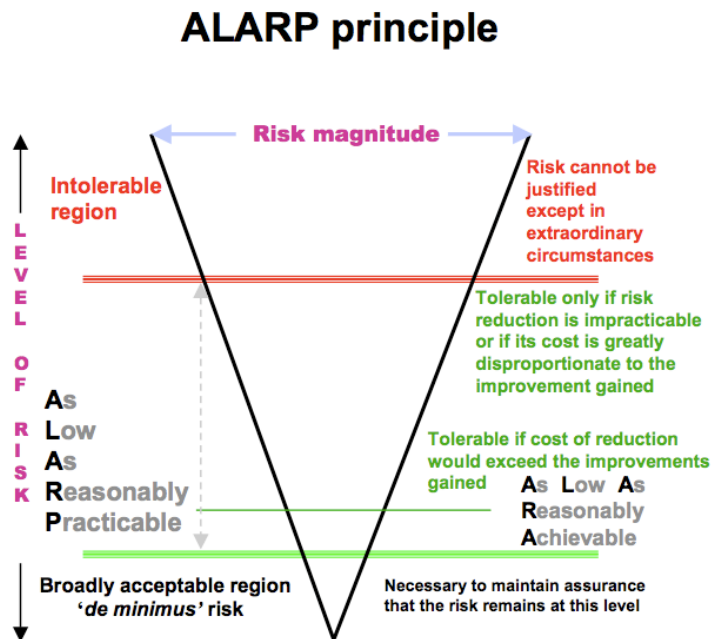
Figure 13: The ALARP principle, adapted from Kuo (2007)

The UK HSE sets out the general responsibilities that employers have towards employees and members of the public, and which employees have to themselves and to each other. These responsibilities are qualified by the principle of 'so far as is reasonably practicable'. In other words, the degree of hazard in a particular job or workplace needs to be balanced against the time, trouble, cost and physical difficulty of taking measures to avoid or reduce the risk.

The regulation requires acting in a way that good management and commercial wisdom would encourage anyway, that is, to look at what the risks are and take sensible measures to reduce them. My company, like most drilling contractors, uses this pragmatic approach, as it is not possible to eliminate the risks associated with activities on board drillships completely.

The zero risk is a politically driven approach, which would lead a major industry, if applied to an extreme, to a completely stop of its operations and consequentially of a loose of its commercial advantage. By politically driven approach I mean an approach that it is often dictated by lobbies, groups of influence and in general activists that working in the pursuit of a safer society are able to influence policy makers to embrace the zero risk approach. However Wildavsky and & Wildavsky (2010) state that "opponents of the 'riskless society' on the other hand, complain that government is unnecessarily proscribing free choice in the pursuit of costly protection that people do not need or want".

The workforce's perception of the risk is therefore is not in line with the pragmatic ALARP approach sought by the company as a risk management tool in while pursuing its commercial gain applying the ALARP method as the risk management tool.

5.2.4 An emerging 'Way Of Life'

The data gathered from the interviews and focus groups imply that the perception of risk of the working community is towards the 'zero risk' category. In other words, the workforce perceives the work as safe when there is no risk associated with it.

In the interviews, eight out of fourteen participants explicitly used the term *"zero risk"* in answer to the question *"What type of Risk is acceptable for you, and why?"*

In the fifth focus group, composed of eight participants, the answer to the same question was "*a zero risk*".

These findings suggest that the workforce is following a specific way of life which falls into the 'egalitarian' category theorised by Douglas (Thompson *et al.* 1990, Douglas 1992).

In order to triangulate the findings, in the next section I analyse and critically discuss the data gathered from the observations. During the observations I registered group and grid values in order to obtain an empirical bi-dimensional measure following Douglas's cultural theory approach. In the following section I demonstrate that these observations support both the views discussed above regarding risk perception and the egalitarian way of life.
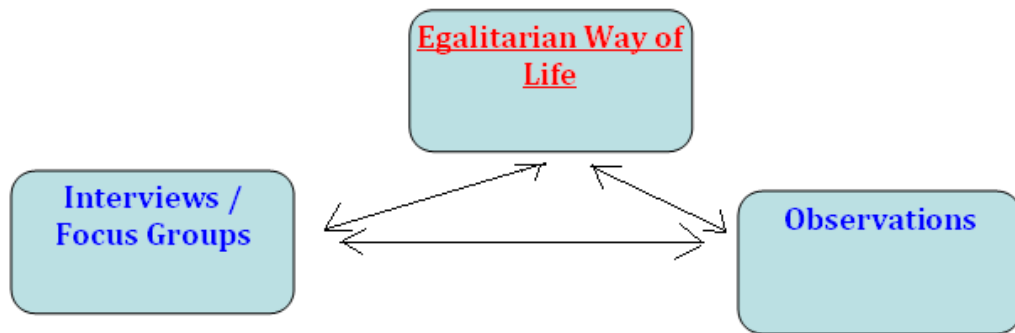
Figure 14: An egalitarian way of life is emerging

5.2.5 Adaptation of Cultural Theory

Chapter 4 provided details of how the workforce was observed in order to gather data. A structured observation table was used in the field by the researcher (Appendix A).

My observations were made with two main objectives in mind: to observe the grid and group indices (Douglas 1992) and the risk behaviour types.

A structured observation table, shown in Appendix A, was used to observe and measure the risk behaviour types, while the grid and group indices were adapted from Thompson *et al.* (1990), Douglas (1992), and Langford *et al.* (2000). The table was used as a practical "prompt" card during the fieldwork activities and permitted the researcher to record qualitative data through participant observations, the measurable group and grid indices, which captured the two dimensions of Douglas's cultural theory, and the risk behaviour types.

The 'grid' dimension captures the externally-imposed and formalised regulation of the actions of individuals, achieved for example through laws and/or regulations. The 'group' dimension describes how strongly people are bonded together and how the behaviour of the members is determined by relationships within the community.

In order to record the determinants of Douglas's approach, values along each dimension, I gave scores for five different coded indices for each dimension, the 'group' and 'grid' indices in five categories coded as; respectively from 1G to 5G for the group dimension and from 1I to 5I for the grid. (see Appendix G).

Group

Code	Measurable Groups Indices	Description
1G	Proportion of time spent in the group by crewmember(s)	An extended period of time spent in the group by crewmember(s) indicates High Group
2G	Frequency of meeting and/or "Think" plan (discussion and planning of operations)	The frequency of meetings and/or discussion, planning indicates High Group
3G	Closeness of connecting character links High/Low group)	Closeness between members indicates High Group
4G	Proportion of shared tasks and job knowledge.	Shared tasks and/or job knowledge indicates High Group
5G	Strength of the boundary of the group	The strength of the boundary of the group indicates whether there are High or Low Group.

Figure 15: Codes for measurable group indices

Figure 15 shows the codes used to assign values for each index along the group dimension. Where applicable, every observation was given a value from 1, representing a low group score, to 5, representing a high group score, for each of the five indices. Below, as an example, I report the scores for Observation #1 for each index. In this specific instance, the indices were all given a high group score, with a value of 5.

Observation #1

Code	Value	Significance
1G	5 (high group)	**Long portion of time together**
2G	5 (high group)	**Many meetings held**
3G	5 (high group)	**High closeness among members**
4G	5 (high group)	**High shared tasks**
5G	5 (high group)	**High boundary strength**

Figure 16 shows the grid indices and codes. Again, where applicable, every observation made was given a value between 1 and 5 for each code/index, where 1 again signified a low grid score and 5 a high score.

Grids

Code	Measurable Grid Indices	Description
1I	Leadership style, i.e. no clear leader "egalitarian" style (low Grid)	The leadership style indicates whether there is a High or Low Grid. No clear leader indicates an "egalitarian" style with Low Gird.
2I	A clear leader is identified (High Grid)	A Clear Leader indicates a High Grid indices
3I	"underdogs" in the group (High Grid)	"Underdogs" present in the group indicates High Grid.
4I	Individualist type, work alone type (Low Grid)	An individualist type of person indicates Low Grid
5I	The roles distributed on basis of social classifications such as age nationalities, sex (High Grid)	If roles are distributed on basis of social classification, High Grid indicators

Figure 16: Codes for the measurable grid indices

As an example, Observation #4 is reported below, low grid scores of 1 are given for **codes 1I, 2I, 3I and 5I** and a medium score of 3 is given to Code 4I. **The latter represents an individualist work style.**

Observation #4

Code	Value	Significance
1I	1(low grid)	No leadership shown
2I	1(low grid)	No clear leader identified
3I	1(low grid)	No 'underdogs'
4I	3(medium)	Someone on the group was working alone, individualist
5I	1(low grid)	No role classifications on the basis of age, sex

For each of the indices for both the grid and group dimensions, I added together the scores assigned to each index across all of the observations. For example, for index 1G, which represents the time spent in the group, I added together the recorded scores for that code for each observation (n=74), which gave me a total value of 140. If code 1G was not applicable for a given observation, its value was considered to be zero. I then used these summed values to graphically symbolise the grid and group determinants, shown respectively in Figures 17 and 18.

- Group

The group dimensions of cultural theory is extremely important, as mentioned earlier,

because it describes how strongly people are bonded together. Thompson *et al. (*1990:5*)* state that "it refers to the extent to which an individual is incorporated into bounded units. The greater the incorporation, the more individual choice is subject to group determination" and that it "taps the extent to which the individual's life is absorbed in and sustained by group membership".

Figure 17 represents graphically the group indices. 1G, 2G and 4G have high values. These indices represent the proportion of time spent in the group by the crewmembers (1G), the frequency of meetings (2G) and the proportion of shared tasks and job knowledge (4G). These aggregate scores suggest a high level of group tightness and strong boundaries in the workforce.

Index 5G, which indicates the boundary strength of the group, has a value of 125, while index 3G, representing the members' closeness, has a value of 123.
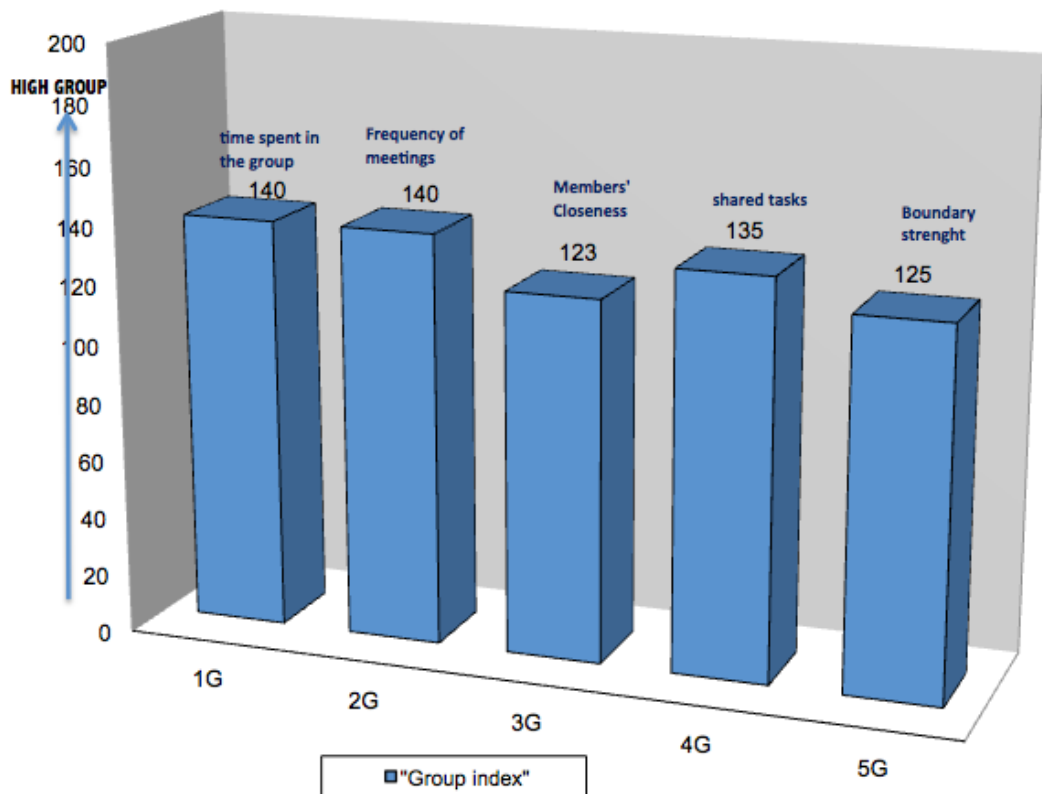
Figure 17 Graphical representation of the group indices

- Grid

'Grid' is the other dimension of cultural theory, representing (as explained earlier) the externally-imposed and formalised regulation of the actions of individuals. Thompson *et al.* (1990:5) explain that 'the grid denotes the degree to which an individual's life is circumscribed by externally imposed prescriptions' and that 'grid refers to rules that relate one person to others on an ego-centered basis' (1990:11).

Figure 18 represents graphically the grid indices. 1I, 2I, 3I and 5I have low values. These indices and scores show that there is no leadership shown (1I has a total value of 42), that a clear leader is not identified in the working group (2I has a score of 41), that no "underdogs" are present (3I = 26, the lowest of all the grid indices) and that the roles are not distributed on the basis of social classifications such as age, nationality or sex (5I). However, 4I had a slightly higher aggregate value of 79, which represents an individualist working style.

Overall, the aforementioned variables indicate a low grid score, except for some observable individualist working activity, mainly due to the peculiarity of certain offshore operations, such as mechanical checks, maintenance and repairs.
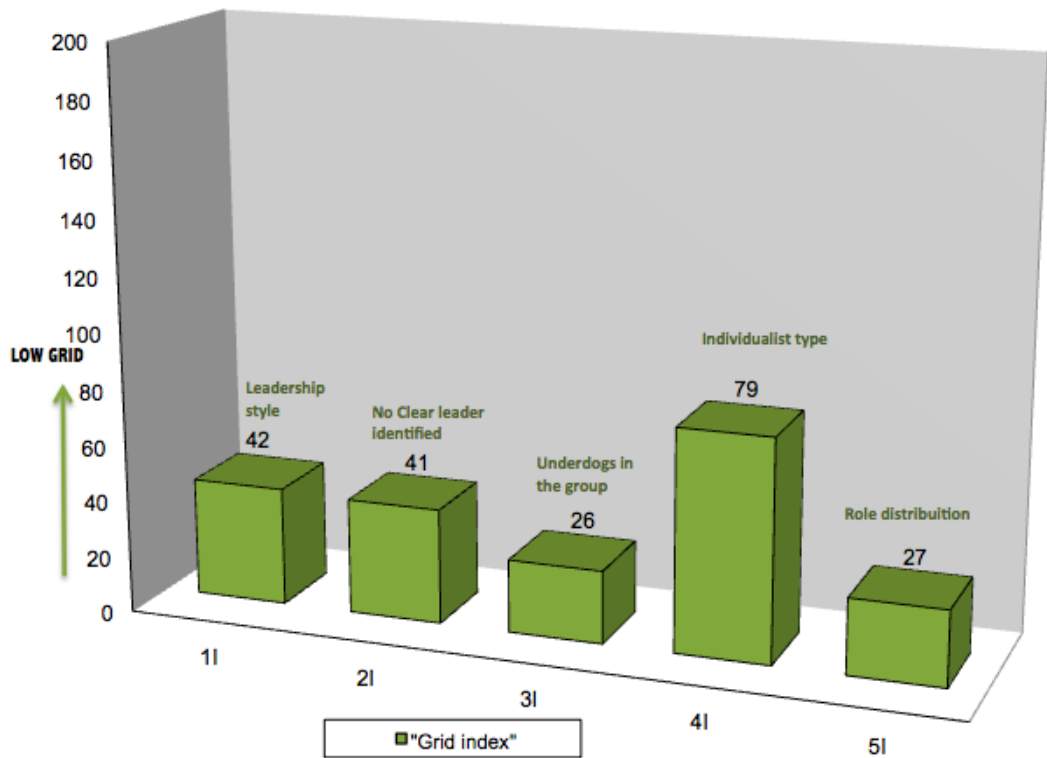
Figure 18:Graphical representation of the grid indices

5.2.6 Egalitarian way of life

The combination of high group and low grid indices specifically suggests the "egalitarian" way of life proposed in Douglas's Cultural Theory, corresponding towards an "Egalitarian" style as indicated by the dimensions Y represented by the closeness of the working community and X which indicates a lack of "underdogs" with a an egalitarian leadership style. This analysis is supported and triangulated by the findings from the interviews and focus groups discussed earlier in this chapter.

This egalitarian "way of life" was also observed in the behaviours of the working community during their free time, both in the galley during meal times and in the accommodation quarters. I observed very low grid factors in these environments, such as very little distinction between supervisors and workers. For instance, everybody wears the same work clothing–there is one type of coverall for working activities and one uniform to be worn inside the accommodation quarters. Everybody shares the same galley and eats the same food. The meal is self-served without distinction between ranks. Other observable behaviours are evident during the crew changes to and from the vessel. Ashore, the crew is generally very sociable and often get together in bars and restaurants

during the voyage from their home towns to and from the work location, where the offshore unit may operate for months at a time. The period spent on board is four weeks interspersed with four weeks of rest. This rotation involves quite a lot of travelling worldwide to reach the vessel's location, often in a group. In addition, I observed that very informal communication was used. First names are used among the employees and the shore-based management. All of the above corresponds with the egalitarian way of life because it shows that roles are not distributed based on social classifications and that there is closeness between the members of the group.

Another important determinant observed is that the job in the working community are primarily allocated based on achievement, which implies that the grid constraints are low. Low grid scores occur when access to jobs depends upon personal abilities or a system of equality, and this is very much the case in the offshore oil industry. Every roustabout, (i.e. entry-level worker) can climb the ladder up to Drilling Supervisor; every mechanic can arise to become a Mechanical or Maintenance Supervisor. Formal education, other than vocational qualification, is required only for the core crew of marine- licensed personnel.

Meanwhile, for the other dimension of cultural theory, the group dimension, this working community displays high values.

I observed that the proportion of time spent in the group compared with the total allocated time is almost 100%. Time is spent together not only during work activities but also while sharing accommodation facilities such as the galley, the recreation room and the cabins, which have two or more bunks.

In summary, the observations gathered during the fieldwork activity support the finding that the crew follow an egalitarian way of life.
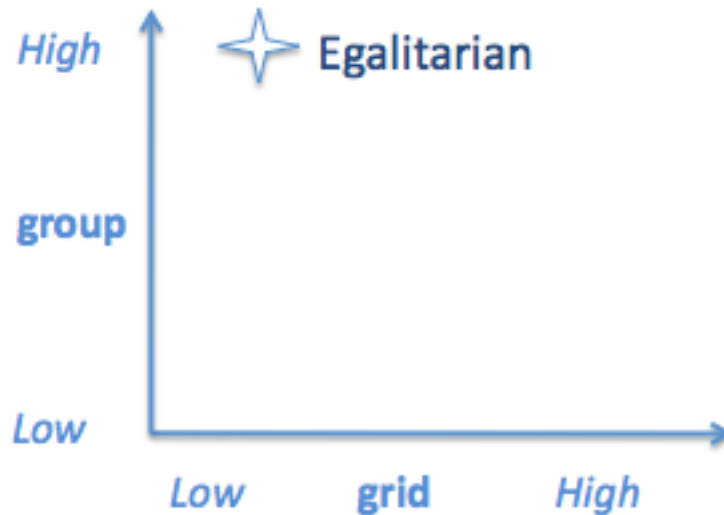
Figure 19: Graphical representation of the egalitarian way of life

In Figure 19 I represent the grid score along the x axis and the group score along the y axis. The white star represents the location of the working community on board the drillship. It is towards the high Group and Low Grid, which is the expression of an Egalitarian view.

As described in Chapter 2, the `egalitarians' are characterised by low grid and high group determinants as per figure 19. Egalitarians usually live in a group where everyone is considered equal, and where the good of the group comes before the good of any individual. Rules are less to do with law and more to do with values. From a risk perception point of view, egalitarians are sensitive to low-probability high-consequence risks and they advocate the precautionary principle. The empirical evidence so far presented supports the idea that this way of life is present on the drillship.

5.2.6.1 Critical Incidents

I recorded critical incidents through my observations and research diary as they are very relevant to my ethnographic approach and representative of this working community's way of life. I would like to mention a particular critical incident, that occurred during an observation of a person working on a platform over the sea. The person was wearing a life-jacket and a full body harness, connected to an inertial reel, as mitigating controls. The observer, however, noticed that the inertial reel's anchor point was not directly above the

worker and therefore the safety line coming from the harness formed an angle of more then 30° from the vertical. This is a deviation from policy, which stipulates a maximum angle of 30°. This requirement is made for a good reason. In the event of a fall, a line at a steeper angle would hold the person but, at the same time, would cause a dangerous swinging effect.

The observer then went to the area supervisor, who was watching the operation, and told him what he had observed. He was slightly unsure about the safety policy, but also had the perception that the risk could be reduced fairly simply by moving the anchor point, in order to create an angle of less than 30°. He asked the supervisor if he was right in thinking that it was unsafe to work with such a large angle in the safety line but the site supervisor said that it was fine and that an inertial reel could also be used horizontally.

The observer came away from the conversation quite frustrated, feeling that the operation had been incorrectly carried out, and he experienced a cognitive dissonance through not stopping the operation by exercising his right to call a Time Out For Safety, as explained in Chapter 4. He thought about the episode for an entire day, and then went back the following morning to speak to the supervisor. The observer told the supervisor that he really thought that the act was unsafe, and that he should have stopped the operation. This time the supervisor admitted that he was wrong and apologised. This was probably a difficult conversation for both of them, but this critical incident once more highlights the egalitarian culture present on the drillship, in which individuals with different job positions and responsibilities in the ship's hierarchy can actually exchange opinions on level ground.

I found this critical incident to be emblematic and it helped me to understand the shared values and cultural bias of the workplace better. Firstly, reflection-in-action about this critical incident made me aware of the observer's risk perception. The worker was tied off and wearing a life-jacket, however, although there was a low probability of falling, the consequence could have been high, so I would classify this risk as low-probability high-consequences. This perception of risk is typical of the egalitarian style. Secondly, the observer displayed safety consciousness as, although he was not personally involved in the job, he took the time to ensure that it was within the level of risk tolerance demanded by the company. This action shows that this individual was living the company's safety culture, which stipulates an incident-free workplace. In addition, as he and the supervisor eventually agreed that the job could have been done more safely, although this was the day after the incident, this demonstrates shared safety values. They both understood that the observation was valuable and the supervisor was willing to acknowledge that he was

wrong. This is obviously not an easy thing to do, and again it helped me to frame this working community even more strongly within the egalitarian way of life. A worker can go to his supervisor and point out a better way of doing something and the good of the group comes before the good of any individual.

Now, I want to briefly shift focus to the reflective activity, which was an implicit part of the reflection-in-action of this project. In fact, reflecting in action on this critical incident helped me to understand that the safety value is quite strong in the working community under study.

.

Figure 20: An Egalitarian Way of Life

5.2.6.2 Risk Perception

Together the cultural biases and shared values present in this working community reveal an egalitarian way of life.

I reported in Chapter 2 that every way of life has a different risk perception, based on shared values and cultural bias. From a Risk Perception point of view, the egalitarian way of life is sensitive to low-probability high-consequence risks. See, for example, studies of risk perceptions in health related risks in (Langford *et al.* (2000), on industrial safety (Gross & Rayner, (1985), and at collective and individual levels (Dake 1991). These investigations support the view of a risk perception based on low probability associated to high consequences by a community classified as 'egalitarian'.
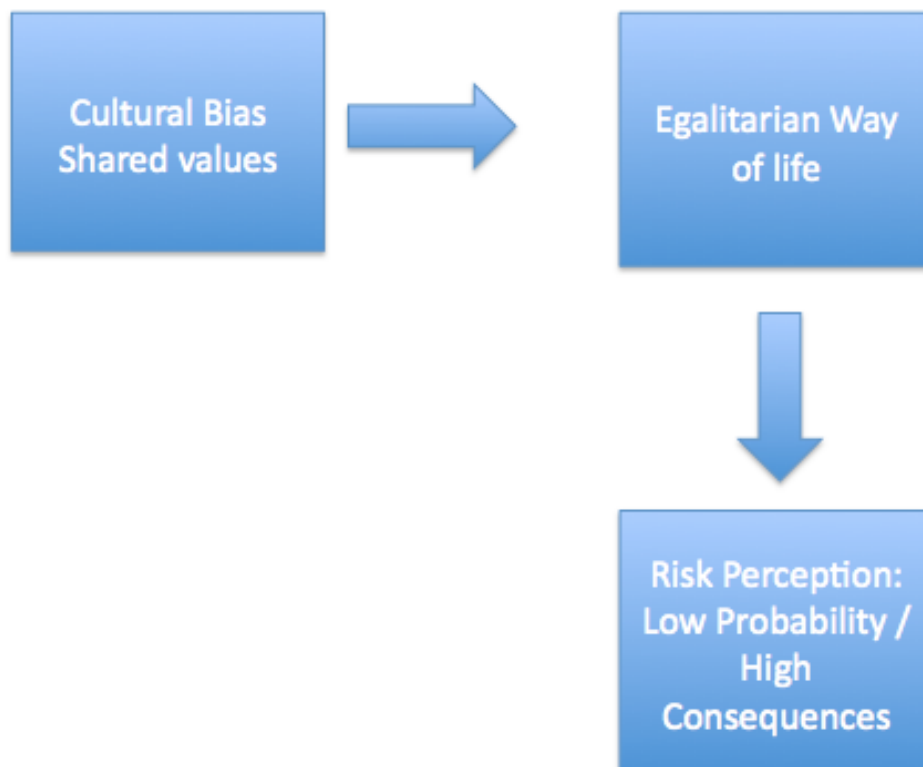
Figure 21: An egalitarian's risk perception

Figure 21 illustrates the risk perception that emerges from an egalitarian community, that is, sensitive to low-probability and high-consequence risks.

Examples of the types of risks that egalitarians are sensitive to, in our context, include explosions, blow outs, and sinking. On the other hand, egalitarians tend not to be

sensitive to high-probability low-consequence risks, such as might occur on so-called "routine jobs".

5.2.7 Classification of the Risk Behaviour Types

The lack of understanding of the concepts of hazard and risk, as detailed earlier, might have an impact on risk behaviour type. In order to classify the risk behaviour type of this working community, I used a structured observation table (see Appendix A) as described in Chapter 4. I used the table as a "prompt" card during the fieldwork activity to record the measurable risk behaviour types qualitatively through participant observations. I used five codes (1B to 5B) to indicate the units of meaning for risk behaviour, as shown in Figure 22.

I assigned a "yes" or "no" value to each applicable unit of meaning during the observations. To clarify with a practical example, during one observation I observed two individuals handling lubricant oil without wearing safety glasses. In this instance, I classified this behaviour as risk producing, using the code "1B yes".

On another occasion, I observed an individual working on a valve for maintenance purposes without isolating the electric pump connected to the valve. Somebody unaware of the work in progress could have started the pump, which could have pumped fluid through the valve directly onto the individual working on it, possibly causing injury. Here, the hazard had not been identified and the risks associated with it had not been assessed. There are company procedures that specify isolating machinery prior to any maintenance and the need to obtain a permit to work before commencing any maintenance job. I therefore classified this action with a "no" value for the "procedural" unit of meaning, assigning the code "3B no". In this particular example, the company policies had not been followed, the hazard of having the pump started not identified and the risk associated to this activity not assessed.

Risk Behavioural Types

Code	Unit of Meaning	Description
1B	Risk Producing	Behaviour which produces Risk such as an improper lift.
2B	Mitigating	Mitigating controls which lessen the consequences of potential incident or accident, such as barrier tapes, Personal Protective Equipments.
3B	Procedural	Follows company policies and procedures, elaborate plans, identify hazards and assess Risks.
4B	Supportive	Supports the safety management system, for example reporting incidents.
5B	Safety Leadership	Demonstrating a clear leadership in Safety, for example acknowledging safe behaviours.

Figure 22: The risk behavioural types (source: Cooper 2002)

Analysing the data, I observed that the determinant of behaviour 1B, Risk Producing, was a "yes" in almost 50% of the observations. This is a very important indication as far as risk behaviour, because it means that in about half of the operations observed during the fieldwork activity, a risk producing behaviour was present. This is a quite a worrying indication, as this types of behaviours may easily lead to an incident. As mentioned previously, the interviews and focus groups indicates a lack of understanding of the concepts of hazard and risk as detailed in the previous paragraphs, and this shortfall in appreciate these concepts may one of the reasons behind such behaviours, which in turn produce risks.

The table below shows the number of recorded values of "yes" and "no" for each unit of meaning (1B to 5B). Note that not all of these units of meaning were applicable for each of the 77 observations carried out, but for some of the observations more than one unit of meaning was applicable. The final column of the table shows the total number of observations for which the given unit of meaning was applicable.

Code 1B, for instance, which represents risk producing behaviour, was recorded as a "yes" for 14 observations and "no" for 15, giving a total of 29 applicable observations.

Code	Value "Yes"	Value "No"	Total N
1B	14	15	29
2B	14	11	25
3B	12	13	25
4B	1		1
5B	6	4	10

Table 5.3 Number of recorded "Yes" and "No" values

Unit of meaning 2B, which represents mitigating controls, received a higher number of "yes" (14) than "no" (11) values. In other words, out of the observations where this was applicable, most of the time mitigating controls were in place to lessen the consequences of a potential incident.

Interesting data can be seen for 3B, which represents procedural behaviours. There are more "no" values, indicating that company policies and procedures are not followed, than "yes" values. This indicates that there may be a lack of knowledge and understanding of company policies and procedures. This view is also supported by the data gathered through the interviews.

Supportive behaviours, coded as 4B, were inapplicable for the majority of the observations. The one recorded "yes" value gives only a small indication of behaviour.

Almost 50% of the observations for which 5B, safety leadership, was applicable, received "no" values, which indicates that there was no clear safety leadership observed during the operations. The lack of clear leadership is a typical trait of an egalitarian lifestyle.
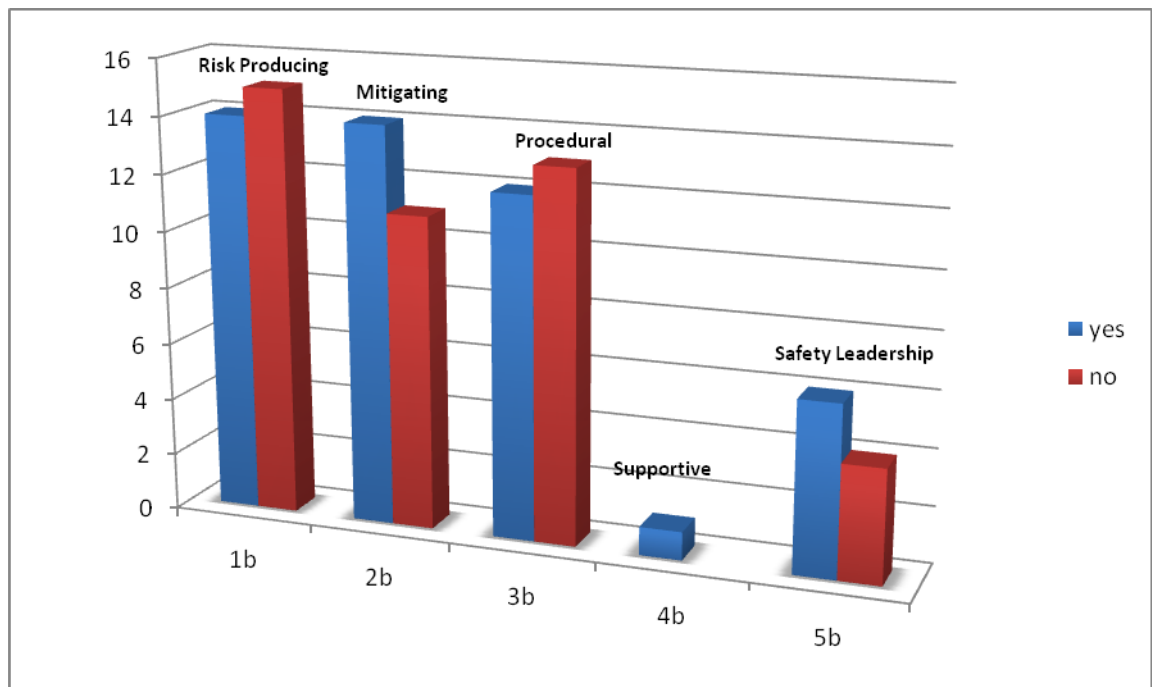
Fig. 23 Graphical representation of risk behavioural types

5.2.8 Interpretation of Safety Culture by the Company

In the interviews and focus groups, few participants were able to name a policy from the safety management system. This is an important point, as in order for the crew to interpret the company safety culture it must first know and understand the safety policies and procedures. Moreover, around 50% of the observations, demonstrated that company policy and procedures were not followed.

An interesting fact that came out of the data analysis is that the maintenance and operation crews have different perceptions of work pressure. The data shows that the maintenance crew do not feel under pressure while performing tasks and do not tend to take shortcuts in their daily activities, but the operations crew do.
Participant D, who belongs to the operation team, stated:

> ” I feel a lot of pressure when in production. It is easy to do everything correctly when there is time, but when we start drilling then it is all a ‘run, run, run!’ ”.

Another member of the operations team, participant I, said:

> “sometimes we take shortcuts to finish our work as we feel under pressure by our supervisor”.

On the other hand, the maintenance personnel said that they were not under pressure when working, as this participant reported in one of the in-depth interviews:

> “I don’t feel pressured at all when doing my job. I am taking my time and my supervisor doesn’t push me”.

The different perceptions of work pressure held by the maintenance and operation crews may be the result of the induced commercial stress on the operation team as a result of being urged to avoid non-productive time which would have a financial impact on the contracted day rate. In fact, if the drilling operations stop for any unforeseen reason a percentage of the stipulated compensation is deducted from the day rate by the client. The biggest pressure is therefore on the operational crews and their line supervisors, and this commercial stress may very easily induce the crews into non-compliance with the safety regime, which in turn could result in incidents and accidents. The maintenance

crew, on the other hand, are less likely to feel the same pressure because, most of the time, they follow a planned maintenance programme, under which pieces of equipment are taken out of service regularly, without any operational impact, to be maintained or repaired.

Most of the participants expressed their belief that management is genuinely interested in improving the safety culture, although there were a few sceptics. Participant G said:

> *"I believe it is only because of money. The company save money being safe. That is the main reason".*

On the same topic, participant H reported that he doesn't think that management is genuinely interested; he stated the following:

> *"I don't think management is genuinely interested in safety, but instead they push this to cover their positions. If an accident happens, they can say well, there are policies and procedures and we told you to work safe!"*

The tables below summarise the findings:

Who	What	Objective	How
Company	Company policies and procedures	To create safe working conditions	Controlling the Risk: ALARP Method
Working community	Workforce *perception*	To create safe working conditions	ZERO Risk Philosophy

Definition	Findings
Way of life	Egalitarian
Hazard identification	Lacking
Perception of a "Safe Job"	With Zero Risk
Risk perception	High-consequence / Low-probability Risks
Maintenance crew	Feels no pressure when carrying out work tasks
Operation Crew	Feels pressure when carrying out work tasks

5.2.9 The concept of "cross-cultural safety consciousness"

The key themes that have emerged from this ethnographic investigation highlight the focus on high-consequence/low-probability risks among this working community. In this context, the cultural relativity of the hazard perception is an instrument for the maintenance of group solidarity. The group that has emerged over the course of this work-based research is culturally biased according to a way of life that characterises and predisposes it to adopt a particular view of the society at work. More precisely, the data analysed shows, through the bi-dimensional framework of cultural theory, that an egalitarian way of life is present in the community.

In other words, the data collected and analysed in this ethnographic investigation establishes that cultural bias and shared values have established a specific way of life among the working community, and this way of life has influenced how the safety is lived and most importantly seen and perceived by the workforce community.

In the light of these findings, I therefore propose the concept of "***cross-cultural safety consciousness"***, which I define as follows:

"an approach to safety which values a perception of risk that is based on cultural biases and shared values"

I also propose a conceptual model of a practical approach to safety, based on the findings of this research, with the aim of reducing the number of incidents in the offshore oil industry.

In the model, I define four distinct stages. In the first, I highlight the necessity to understand the cultural biases and shared values of the community of practice under study.

In the second, I crystallise the need to classify the working community based on the cultural theory framework (Douglas 1990).

The third stage is directly linked to the second. In it, the risk perception of the working community is predicted based on the cultural theory classification made in stage two.

In the fourth stage of the conceptual model I found necessary to put controls in place, based on the risk perception predicted in stage three, as a barrier to incidents.

Cross-cultural Safety Consciousness Model
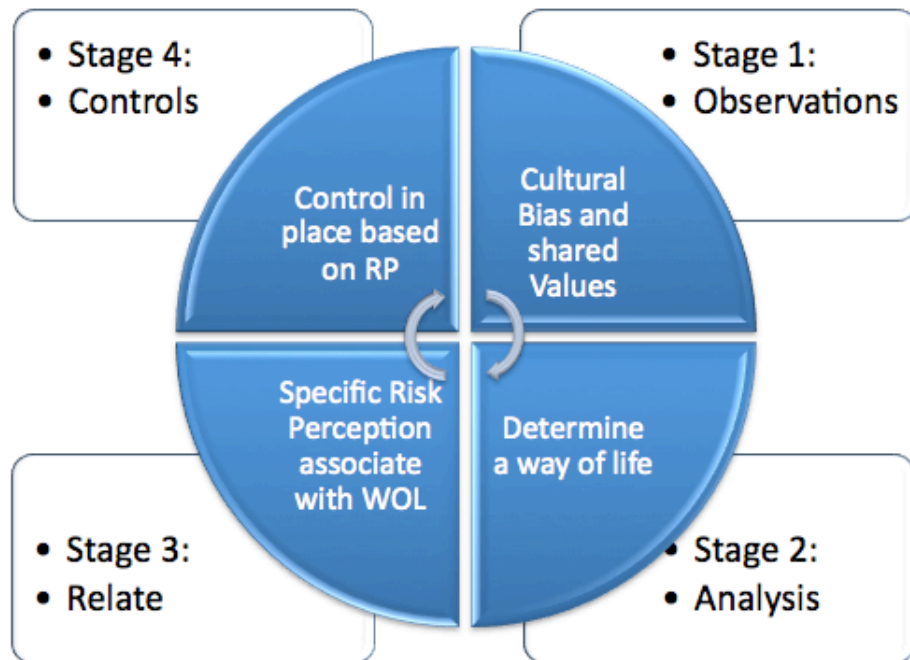
Figure 24: Cross-cultural safety consciousness model

Applying the model proposed in Figure 24 to the current project, the first stage is to determine the cultural bias and shared values of the working community on the drillship, which the researcher was able to do by analysing the data provided by the ethnographic investigation. Stage two, classifying the working community according to cultural theory based on the aforementioned shared values and cultural bias, led to the conclusion that the way of life on the drillship is egalitarian. In stage three, it was deduced that the specific risk perception implied by this way of life is a focus on risks with high consequences and low probabilities. Finally, stage four of the proposed model will be to put controls in place for those risks that are perceived as having low consequences but high probabilities, which are the ones that are not apparent to this working community and thus likely to cause incidents. In other words the research findings suggest that it is necessary to put controls and barriers in place *where risk is not perceived.*

With the implementation of this model a significant reduction in work-related incidents is expected, due to fact that barriers will be put in place against risks that are not currently being perceived and which therefore pose the biggest threat of causing incidents. Risks with low consequences but high probabilities can certainly escalate into serious injuries or

worse if not perceived correctly by the working community. Barriers need to be put in place to prevent these incidents from happening.

5.3 Conclusion

In summary, this ethnographic investigation has revealed that the egalitarian way of life, described in Douglas's (1990) cultural theory, is present in the community of practice under study. This way of life is associated with a focus on high-consequence low-probability risks. The research also highlighted that, among the multicultural workforce, there is a general lack of hazard identification and a "zero risk" philosophy as opposed to the pragmatic risk management method sought by the company.

The implications for the professional practice are therefore to move towards a different safety management system in the offshore oil business, one which applies the analyses and findings of cultural theory to this very complex and multicultural environment in which the interaction between the human element and policies and procedures is not straightforward but governed by many different elements, as emerged from this work-based research.

Further research would be appropriate in the practice to look into applying cultural theory and the model proposed here, in order to test it and to reduce, and ideally eliminate, the incident rate in the industry.

C H A P T E R   6

CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

This project investigated a multicultural workforce on an offshore installation engaged in drilling operations in the offshore oil industry, using an ethnographic approach where I acted as the participant observer.

Specifically, the project has explored how the globalised, multicultural offshore working community understand their activities and their involvement in the safety management systems in place on board drillships. I attempted to accomplish this by placing a strong emphasis on fieldwork that was carried out aboard an offshore installation. Analytical and theoretical insights gained from cultural theories of organisational behaviour (Douglas 1978, 1992, 2005, Douglas & Wildavsky 1982, Thompson *et al.* 1990) were used to unveil the cultural biases and shared beliefs, which could affect the safety and hence the performance levels of the personnel involved in offshore operations.

This chapter links directly to the previous one, in which the findings of the project were presented. First of all I briefly outline the aim and objective of this work-based project, and then summarise the conclusions and recommendations of the research with reference to the research questions delineated in Chapter 2. Finally, major implications for the industry and suggestions for future research in the field will be considered.

6.1 A General Evaluation of the Project

6.1.1 Aim and objective

My aim in this work-based project was to investigate methods of minimising occupational casualties in the offshore industry, with a focus on the social science paradigms of human action, taking into account the complexities involved in managing multiculturally diverse crews. The project addressed the variability in perceptions of risk between and among different groups and how this can affect the safety of offshore workers. Specifically, the objective of the research was to investigate the interaction between the multicultural crew of an offshore installation and its safety management systems, and whether this interaction influences occupational health and safety in this section of the industry.

6.1.2 Research questions

In order to achieve the above, the project was guided by the following research questions, about which I now draw conclusions based on the findings presented in the previous chapter.

1. How does the interaction between the human element, represented by a multicultural crew, and the safety management systems that are put in place, influence health and safety in the offshore oil industry?

The occupational health and safety of the workforce on this drillship has been influenced by their perception of risks that is associated with a specific way of life. This way of life is defined by cultural bias and shared values, and this bias has affected the way the safety is lived and practised aboard the offshore installation. The way of life that has emerged from this research is labelled egalitarian. People in this group tend to be very sensitive to high-consequence/low-probability risks and this perception has influenced how the safety management systems are lived by the crew.

2. How have individuals interpreted and put into practice the safety culture adopted by the company?

The individuals making up the workforce on this installation have an interpretation of safety culture which differs from the company's. Given the workforce's egalitarian stance, it tends to see a job as "safe" only when there are no risks associated with it. This particular way of life tends therefore towards the "zero risk approach" when performing a task. The company, however, stipulates in its risk management approach that risks should be reduced based on ALARP (as low as reasonably practicable).

3. What do the crew expect in terms of safety performance?

The crew's expectation in terms of safety performance is quite homogeneous; the goal is mainly not getting hurt. At the end of a period of working aboard the offshore installation, the multicultural workforce expects to go back home to their families in the same physical condition as they were in when they arrived. To achieve this objective, the workforce aims to eliminate hazards and reduce the risk to zero.

4. How does the multicultural crew perceive the risks?

The crew is very sensitive to high consequence/low probability risks. This has a practical implication: stage four of the model proposed in Chapter 5 suggests putting controls in place that are related to risks perceived as having low consequences but high probabilities. These are the risks that are not currently apparent to the working community and likely to cause incidents. In other words, the research findings suggest that it is necessary to put in place controls and barriers *where the risk is not perceived.*

5. Is "zero incidents" a plausible goal?

"Zero incidents' is an ambitious goal and is yet to be achieved. The findings of this project show that risk producing behaviours that can easily lead to incidents. The interviews and focus groups indicated a lack of understanding of the concepts of hazard and risk and this may contribute to the prevalence of risk-producing behaviour.

6.2 Some Analytical Generalisations

I would like to draw some analytical generalisations regarding the findings of this research. This project enabled me to explore the important issue of how multicultural crews interact with safety management systems in the peculiar working conditions of an offshore installation. I applied cultural theories based upon the theoretical framework laid down by Douglas (1978, 1992, 2005) in order to understand the effects of this interaction. The chosen ethnographic approach with myself as participant observer enabled me to answer the research questions and hence to propose some conclusions and recommendations.

- Cultural diversity is an important issue in safety management and needs to be understood and addressed by management and the supervisors delegated to manage human resources. This project has shown that "cross-cultural safety consciousness" is a key element in achieving a safe working environment. I propose therefore a practical application of the model presented in the previous chapter. Using a structured observation table with measurable grid and group indices (Appendix H), an observer can give a numerical value from one to five to each observable category. These structured observations empirically measure where the working community can be placed on the bi-dimensional cultural theory framework. This is stage one of the proposed cross-cultural safety consciousness (CCSC) model.
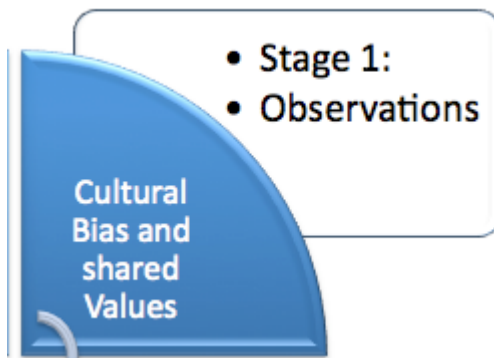
Figure 25: First stage of the CCSC Model

Once the index scores have been collected, they are analysed to determine the way of life of the working community. This is the second stage of the CCSC model.
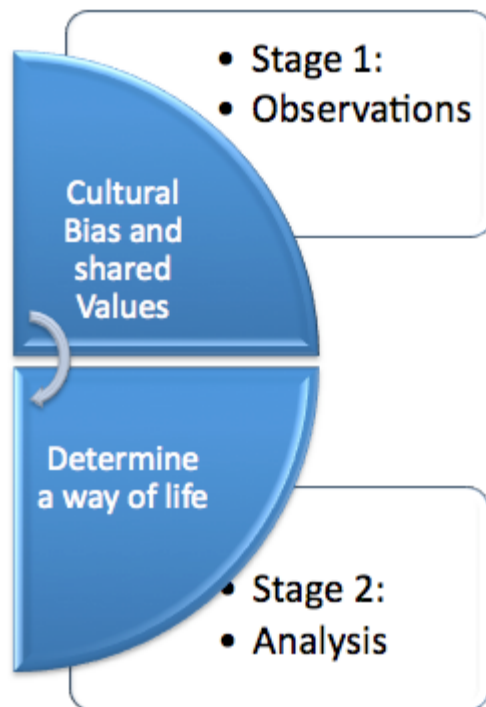
Figure 26: Second stage of the CCSC Model

Next, in stage three, the way of life, emerged from the analysis in stage two, is related to a specific risk perception.
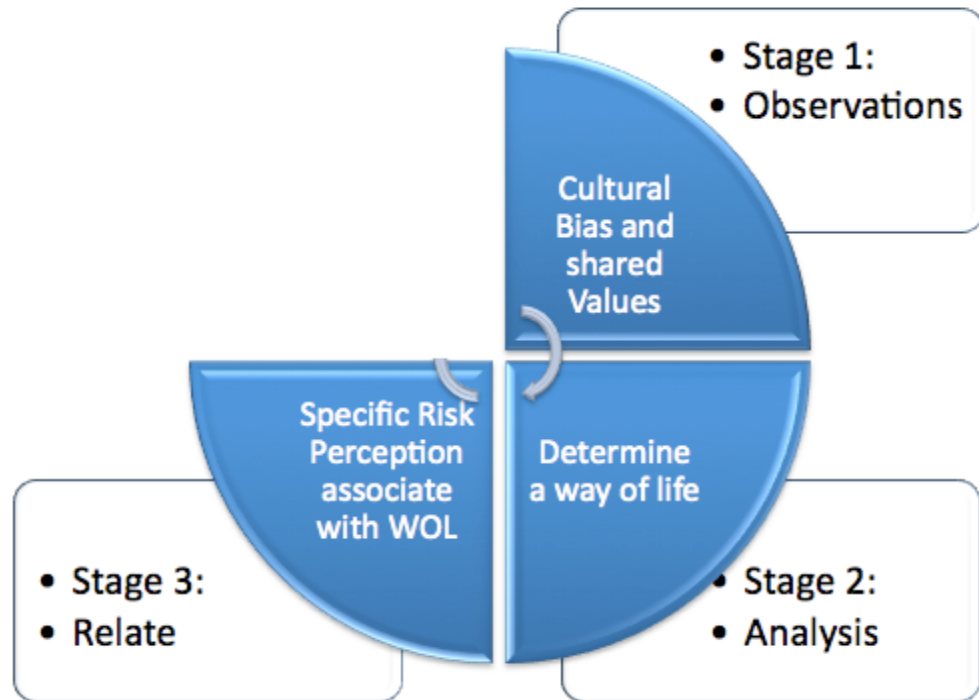
Figure 27: Third stage of the CCSC Model

Given the way of life of the working community and the risk perception associated with it, I then propose putting controls in place to deal with those risks that are not currently perceived and thus where the likelihood of having an incident is higher. In this research, the working community follows an egalitarian pattern and is sensitive to high-consequence/low-probability risks, so extra controls need to be put in place for low-consequence/high-probability risks.

A practical example could be cleaning drilling pipe threads. From a risk assessment point of view, the risk in this job can be classified as having low consequences but potentially a high probability of occurring. For instance, the solvent used for cleaning the threads could damage the skin or particles coming off the pipe could fly into the eye. The model gives us the advantage of understanding the lack of perception of these types of risks by this working community, and therefore raises awareness, which can be transformed into "safety barriers". For instance, in this task, the "safety barriers" could be improved

personal protection equipment such as using a full face shield over the safety glasses and gloves for chemical use, and isolation of the surrounding area. This is the final stage of my proposed solution, the CCSC model.

Cross-cultural Safety Consciousness Model
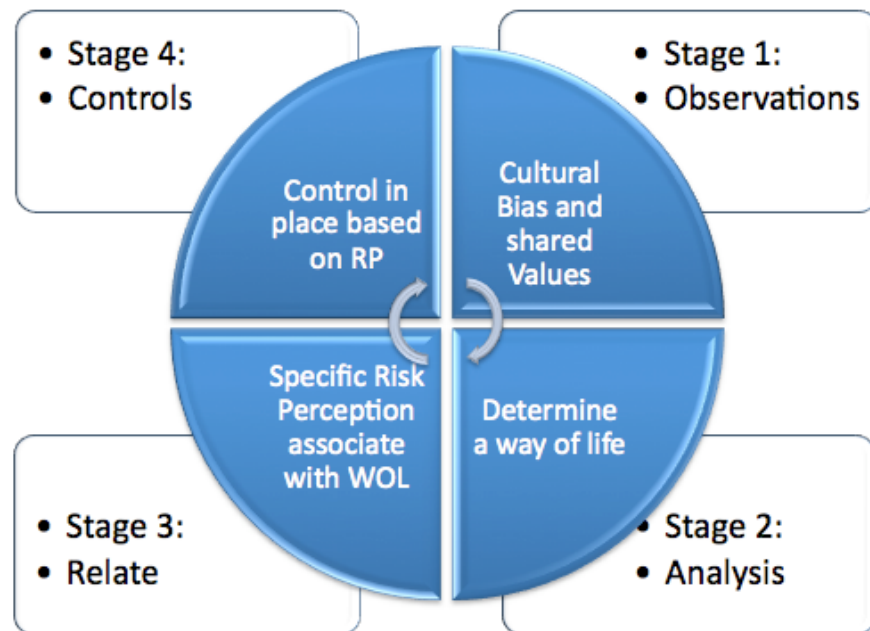
Figure 28: Fourth stage of the CCSC Model

- Effective training in basic safety management is needed as some of the basic concepts are not understood by the workforce, namely, the importance of hazard identification and risk assessment. The training I envision would be composed of both a practical and a theoretical part. Firstly, I would propose carrying out some basic, practical exercises in the classroom involving hazard identification and risk assessment. At the end of the exercise, I would go over the exercise, pointing out the eventual lack of hazard identification followed by the risk analysis, assessing the hazard's significance based on the consequences of its outcome and the

117

probability of its occurrence. At this point I would suggest possible safety barriers, which could be either preventive or mitigating.

- Technical jargon should be avoided (De Rossi, 2010) by using a terminology easily understood by a workforce whose first language may not be English. The concepts of hazard and risk should be explained in simple terms, with practical examples of hazard identification and risk assessment highlighting the importance of the two processes; first the identification of the hazard, then the assessment of the risk.

- This project has proven that assessing the "way of life" of a given community is instrumental in understanding its risk perceptions. This in turn allows us to put barriers in place where risks are not perceived and where an incident is more likely to occur.

6.3 Major Implications

Through my work-based research I aimed to investigate ways of improving the safety of offshore workers by looking at the influence that multicultural crews have on safety management systems. The new paradigm of *cross-cultural safety* is, in my opinion, becoming an important element in its own right in today's global labour market, in which cultural influences cannot be left unaddressed in the quest for optimal safety. My effort to use cultural theories in this project has provided a possible answer to this important issue. The major implications of this project for practice and further research are outlined below.

Implications for practice

- My project highlighted the implications of cross-cultural safety on an offshore installation, and proposes the application of the CCSC Model to improve safety. A practical guide to implementing this model on an offshore installation is provided in Appendix O. As a practitioner, I welcome the practical application of such a model

118

aimed at improving the health and safety of offshore workers while focusing on the multiculturalism of this population.

- This project will help the community of practice to gain awareness of cross-cultural effects on safety management systems. I have presented my research at two international conferences and published articles in professional magazines, with the aim of disseminating the proposed model and my findings. In my opinion, this is an important issue that deserved investigation.

- Moreover, the research highlighted the fact that risk can be perceived in different ways by diverse groups, as defined here by the "way of life", and that this perception is formed through shared values and cultural bias.

- Finally, the project highlighted the importance of basic safety training using clear language that is free of technical jargon, and can be understood easily by a multicultural workforce whose first language is unlikely to be English and whose education level could be relatively low. The training I suggest would aim to explain to the audience the concepts of multicultural diversity and the four different "ways of life" with their associated risk perceptions.

The specific aim would be to highlight the different perceptions of risk based on shared values and cultural biases and raise awareness of the types of risk that are not being perceived, in order to improve safety. For practical and training purposes, a Cultural Diversity Indicator (CDI) questionnaire should be developed to determine the individuals' "way of life". As a 'spin off' of this project, I aim to create such a questionnaire, which will be part of some consultancy activity I plan to carry out based upon the findings of this research.

The CDI will tell individuals what their cultural bias and shared values are, expressed as one of the four ways of life, egalitarian, individualist, hierarchical and fatalist. The individual will then be made aware of his cultural positioning in terms of the bi-dimensional cultural theory, and in turn the risk perception associated with

it. Being aware of their own risk perceptions will help individuals during the risk assessment process. For example, an egalitarian should pay extra attention to identifying high-probability/low-consequence risks, as he is less likely to identify them automatically.

6.3.1 Implications for practice, transferability to other industries.

My project has highlighted the implications of cross-cultural safety in a working community and my conclusions are transferrable to other industries. The work of Mearns & Yulea (2009) addresses the issue of occupational safety and how the process of globalisation can potentially influence the attitudes, beliefs, and risk-taking behaviour of the workforce of a multi-national engineering organisation operating in six countries.

Welch *et al.* (1988) report that the hospitality industry in the US has become culturally pluralistic and that there is a need for management to understand the cultural basis of value systems, social and interpersonal interactions, the work ethic, motivation, and communication systems. They also show that a multicultural awareness in the hospitality industry will provide individuals with a cross-cultural perspective on management styles and skills.

Europe is facing the same challenges. For instance, Prendergast (2009) says that Irish workplaces have gradually had to confront the complex issues faced by other multicultural organisations, and proposes an investigation into the levels of transfer of learning on completion of Health and Safety training programmes by non-Irish workers in Ireland. The research also proposes an extension of the current Health and Safety Authority Research to all industry sectors, to investigate perceptions of risk and language knowledge among non-Irish nationals. Safety statistics still show a high number of fatal incidents. The UK alone reports that 152 workers were fatally injured during the years 2009/2010 as of June 2010 (HSE 2010).

Internationally, construction sites are nowadays a multicultural working environment. This important element has been analysed and studied by various researchers. See for example the work of Enshassia & Burgessb (1990) who highlight the importance of cross-cultural training for construction site managers working with multicultural workforces in the Middle East. Further to this, the work of Santoso (2009) raises the issue that construction projects have become progressively multicultural, especially in countries with a limited labour force, where there is need to depend on migrant workers. Santoso's (2009) study

suggests that communication, wage segmentation, task assignment, trust, scapegoatism, belief and religion are the most important aspects which need to be taken into account in order to produce an effective working and living environment on a multicultural construction site.

Ochienga & Priceb (2010) report that the increasingly global nature of construction projects has highlighted the importance of multiculturalism and the new challenges it brings to project execution. Busta *et al.* (2008) write that the challenge to convert health and safety systems to accommodate multinational/multicultural workforces is being addressed through initiatives such as the translation of safety materials, the use of interpreters and the use of visual methods of communication. However, they also report that there is little scientific evidence to support the effectiveness of these initiatives and propose that investigations into these methods and the effects of the migrant workforce on health and safety are carried out.

Hovdena *et al.* (2010) discuss occupational accident modelling challenges associated with a changing working life, and ask whether ideas from models developed for high-risk, complex socio-technical systems can be transformed and adapted for use in occupational accident prevention.

The complexity of the social science paradigms of human action and cultural diversity explored in my work-based project suggest that my conclusions could be transferred to any multicultural environment, as defined by Cultural Theory (Douglas 1982), in which safety management systems interact with a working community. The CCSC Model proposed here could be an alternative method for minimising occupational casualties in the emerging global labour market, where multiculturalism may have a significant impact on occupational health and safety regimes in different industries.

Disseminating and testing the emerging propositions, and engaging in debate with the professional community

In order to disseminate my research, I presented it to international conferences and published articles in professional magazines.

I first had the opportunity to publish in ReportIsm, a regular electronic newsletter providing news and opinion from around the world on International Safety Management System related issues. Please see Appendix K for a copy of the article.

In the newsletter, I presented my research aim and objective and argued that the risk perceptions among different cultural groups are dissimilar, based on the assumption that such perceptions are socially constructed.

I then wrote an article entitled "Has the 'global village' influenced the Safety of our ships?" for the International Human Element Bulletin, an online journal sponsored by Lloyd's Register Educational Trust (Appendix P).

As the research began to develop, I presented a paper to the International Conference on Services Management at Oxford Brookes University, which demonstrated my work in progress for a cross-cultural track. (see Appendices H and I).

In September 2010 I presented a paper in Rome entitled "Cultural Theories in Offshore Oil Health and Safety", at the 8th International Scientific Conference for Health, Work and Social Responsibility. This provided another opportunity to disseminate my research in the scientific and professional community.

> ➢ Articles in professional magazines

While carrying out my research, I began to collaborate with the Nautical Institute, writing for the its international magazine "Seaways" as author of the Captain's Column. The Nautical Institute is a thriving international professional body for qualified mariners, with over forty branches worldwide and more than 7,000 members in 110 countries. Writing for the magazine gave me the chance to touch on some of the topics that have emerged from my project (see Appendices M,N,L).

I plan to write an article for "Seaways" in which I will present my research findings to the international professional community.

I also plan to present my findings to the Maritime Training & Human Element Section of the International Maritime Organisation (IMO), a United Nations agency, as the head of the section has welcomed my research (Appendix D).

The editor of Nautilus International Telegraph, an award-winning monthly newspaper for maritime professionals with an international circulation of around 34,000 copies, has shown a keen interest in publishing the findings of this research. The newspaper is the official voice of Nautilus International, the union for maritime professionals at sea and ashore (see Appendix D).

An article entitled "How to build a better industry" was published in the August 2010 issue of the Nautilus, presenting the findings of my research. (Appendix Q).

Implications for further research

This work-based project has clearly highlighted the need for further research into applying cultural theories to safety management systems in a cross-cultural context. Specifically, in the light of my findings, the following research would be welcome:

- The CCSC Model should be applied in a working environment to determine the dominant way of life and the associated risk perception and, based on this knowledge, to implement a safety programme of barriers against those risks that are being ignored. These barriers would consist of methods of preventing accidents happening in cases where the risk is less apparent. Such barriers would be preventive measures, such as hardware modifications, personal protective equipment, working methodologies, or training.
- Comparative case studies would be welcome to compare safety management systems with and without the use of the CCSC Model.

6.4 Recommendations

This work-based project has provided an opportunity for an investigation of the way safety management systems are implemented on board an offshore installation and its impact on multi-cultural crews. The findings of this project should be used in a careful consideration of the implications of cross-cultural biases on the health and safety of the offshore working community.

The following recommendations have arisen from my review of the findings.

1. The Safety Management Manual should be revised in the light of my findings to reflect the impact of multiculturalism on health and safety. A chapter about cross-cultural consciousness should be developed, in order to raise awareness among the workforce. The chapter should explain the effect of cultural biases and shared values on perceptions of risk. The grid and group concepts should be explained as well as how different combinations of these values produce the four ways of life. Finally, the particular type of risk perception associated with each "way of life" should be explained, with an emphasis on the fact that accidents are more likely to happen when workers are unaware of the risks.

2. A pilot study of the CCSC Model should be implemented on an offshore installation to determine the way of life on board.

3. Once the way of life has been established, and hence the associated risk perception, safety barriers should be set in place for those risks which are not currently being identified. These would involve preventive measures which would reduce the likelihood of an incident happening. Such measures could involve hardware, such as structural modifications or procedural actions. The safety barriers should be discussed during the job planning stage. Once in place, the leader of the team performing the job should monitor the barriers, but the accountability would lie with the workers.

4. Safety management policies and procedures should be revised in order to remove technical jargon, which is not appropriate for the offshore workforce.

5. Training for supervisors and managers about cross-cultural safety consciousness should be implemented in order to achieve a safer working environment. The training should provide information about cultural differences, with an emphasis on the effect of shared values and cultural biases on risk perceptions. The CCSC Method should be proposed in the training, with an explanation of the risk perceptions associated with each way of life. The training should also explain that an accident is more likely to happen if the risk is not seen. Practical examples drawn from offshore operations should be presented to the audience, showing the implications of a lack of awareness of certain risks and the need to bring such risks to the attention of the workforce. The course should be run before and after the implementation of the CCSC Model, with feedback sought from the attendees.

6. Feedback from the course attendees should be taken into consideration for further development of the training syllabus.

7. Effective training in basic safety management is necessary for those in non-supervisory roles because fundamental concepts are currently not fully understood by the workforce.

6.5 Conclusion

This work-based project has given me the opportunity to investigate the important issue of health and safety in a multicultural environment. In today's globalised labour market it is impossible to ignore cross-cultural implications and certainly the impact on health and safety is worth investigating. Cultural biases and shared beliefs have an impact on the perception of risks, and the knowledge of this correlation would give practitioners an insight into where they need to put 'safety barriers' to reduce the likelihood of an incident occurring. I believe that with this research I have unveiled some important issues and I hope that my findings will lead to further research into social science paradigms of human

action, taking into account the complexities involved in crews with multicultural diversity. I believe that my research will have international implications and importance, I claim 'copyright' for the model proposed and suggest that new strategies and policies can be developed based on its basis, and diffused at a company level, IMO and international level.

C H A P T E R   7

CRITICAL REFLECTIONS

7.0 Introduction

This chapter provides a reflexive account of my personal learning and professional journey, firstly regarding this work-based research and then the DProf programme as a whole.

7.1 Reflections on the Work-Based Research Project Process

This research has given me the opportunity to investigate an important aspect of my profession, the safety of our operations. Health and safety is strongly linked to the success of our activities, as there can be no successful operation if it is not also incident-free. My objective was to research the interaction between multicultural crews and safety management systems and the influence of this interaction on health and safety in the offshore oil industry. The project started in South Africa, continued in South Korea and Malaysia and finally ended in India. The research therefore became multicultural not only with regards the research topic but also as far as work locations. This international dimension added further value to the project because I was able to explore cultural differences using an ethnographic approach in many different geographical locations.

I enjoyed the entire research process, especially the 120 days spent on fieldwork activities, which I found both stimulating and challenging. My dual role as ship's captain and researcher required a strong ethical commitment and I must add that, although I enjoyed the project, wearing two hats at the same time was not easy. I appreciated the careful planning made beforehand during the research proposal stage. This helped me to deal with ethical and practical issues that had been thought through beforehand, in Module 4561.

I must also add that my commitment to the doctoral programme added more strain to my already busy life, as I am a full-time professional working aboard offshore drilling units worldwide, with a family at home waiting to spend time with me when I am off the ship, and requiring my full attention during these periods. I was, however, aware of the challenge, having achieved a Master's degree in Work Based Learning a few years ago,

again while working full-time. I was therefore conscious that I needed to balance my work activities, my life and my studies very carefully. The distance learning approach surely requires a strong commitment from the candidate; this for a very pragmatic reason, as there is nobody telling you what to do and when to do it. The Work Based Learning and the Professional Studies courses do have, however, a distinct advantage compared to more traditional study patterns: the advantage is, in my opinion, that the DProf in general and the research project specifically are firmly grounded into the candidate's profession. This was certainly the case in my research. In my professional life, safety plays a key role, since, as mentioned above, any successful operation must be safe and incident free. Thus, investigating possible ways to improve safety in our operations is closely linked to my professional activities.

My main reason for investigating multicultural crews, safety management systems and health and safety in the offshore oil industry was my keen interest in the subject. I truly believe that every effort should be made in order to make our working environment safer. It is in fact unbearable in today's society to face the ethical dilemma of seeing human lives lost in the working arena merely in the pursuit of financial gain. I feel passionate about this and, moreover, as a practitioner at the sharp end of the industry, I felt that I was privileged to be able to carry out such important research.

The work-based approach was beneficial as I was not a 'professional researcher' on board the offshore unit, trying to understand behavioural patterns and the way of life. On the contrary, I was a 'researcher-professional', at ease in its own practice. This is one of the benefits of a work-based project, and it must be added that the research was underpinned by a rigorous doctoral programme of study. I also believe that my chosen approach of ethnography was appropriate for the investigation I decided to pursue, given that I was immersed in the working community virtually 24 hours a day, 7 days a week. I had the advantage that I had shared half of my life with my crews and did not need to go 'native' because I was already 'out there' as a participant-observer of the community I was investigating. I saw this characteristic as a distinct advantage. Moreover, the chosen research method was certainly appropriate for the nature of this qualitative research.

I must add that I was obviously connected to the objective of the research. I have acknowledged the reflexivity and subjectivity of my studies and clearly outlined the ethical considerations I took into account earlier in this project. This is, however, the very nature of Work Based Learning, the so-called worker-researcher duality. It is undoubtedly true that in social science we investigate something 'outside' ourselves, but this paradigm has

an exception in the WBL investigations, in that the researcher is always, in some way, connected to the objective of the research.

The 'full immersion' into the subject under study meant that I was constantly reflecting in action about my project while I was aboard the drillship. This is an important point, I believe. During the whole DProf programme, I reflected upon my professional practice, by reflection I mean thinking deeply about my role as a researcher-practitioner trying, through the work-based learning structure, to make an impact on my profession.

This project was carried out under the umbrella of the work-based learning paradigm (Armsby 2000), and I am sure that learning through reflections has been a big part of the process, where in fact work-based learning put its emphasis as opposed to more traditional academic qualifications.

I would also like to add that I have generated a 'Mode 2' (Gibbons *et al.* 1994) type of knowledge among professionals and organisations, which differs from the discipline-based 'Mode 1' of the academic community, which is investigator-initiated and likely to be produced within academia. Sharing and disseminating the knowledge gained through this work-based project is another important part of the DProf programme. It is essential to share research findings with one's professional community in order to test propositions and engage in debates with fellow professionals as well as with the academic community. Below, I outline how I have begun to disseminate my emerging propositions.

7.1.1. **Sharing and Disseminating**

When I started working on the research project, I was keen to disseminate and share my findings and I welcomed the chance to present my project at international conferences and publish articles in professional magazines.

In April 2009, I had the opportunity to publish to ReportIsm, a regular electronic newsletter providing news and opinion from around the world on International Safety Management System related issues. Please see Appendix K.

In the article, I presented my research aim and objective and argued that the risk perceptions among different cultural groups are dissimilar, based on the assumption that this perception is socially constructed. I stated that my professional experience suggested that there was a lack of cross-cultural awareness among multicultural crews. Many studies on health and safety have been carried out during the years, focusing on psychology,

rather than on multicultural diversity, which I was investigating. Although it was a short piece, the newsletter was distributed worldwide to the professional maritime community.

As the research developed, I looked for an opportunity to share my thoughts and progress with the academic and professional community. I submitted a paper to the International Conference on Services Management at Oxford Brookes University, in May 2009, with the aim of presenting my work in progress at a cross-cultural track. I was pleased to have my paper, entitled "*The interaction of multicultural crew with safety management systems in Offshore Oil Industry",* accepted with useful feedback from the peer reviewer. At the conference, I present my research topic to an academic audience which gave me the opportunity to test my emerging propositions about cross-cultural impacts on safety management systems. I had the chance to exchange thoughts on cross-cultural studies with fellow doctoral candidates and academics with a research interest in the topic (see Appendices H and I).

➢ **Articles in professional magazines**

While carrying out my research, I began to collaborate with the Nautical Institute, writing for its international magazine "Seaways" as the author of the Captain's Column. This gave me the chance to touch on some of the topics that emerged from my project, such as risk perception concepts and the safety jargon widely used by experts, which I see as a barrier to the understanding of critical concepts. I found this a productive way to share my thoughts and experiences with the professional community. I received emails from colleagues about some of the topics and this was stimulating for me, as I was able to discuss safety topics with fellow practitioners. I wrote the following articles:

o De Rossi, V. (2010) Captain's Column: *Clear away the jargon*. Seaways, 1, p. 3 (Appendix M).

o De Rossi, V. (2009e) Captain's Column: *Risk Perception*. Seaways, 10, p. 3 (Appendix N).

o De Rossi, V. (2009d) Captain's Column: *A Maiden Voyage*. Seaways, 8, p. 3 (Appendix L).

I also wrote an article for the International Human Element Bulletin, an online journal sponsored by Lloyd's Register Educational Trust, with the aim of improving awareness of the human element in the maritime industry (see Appendix P).

An abstract of my research, entitled "Cultural Theories in the Offshore Oil Health and Safety" was accepted by a peer review for the forthcoming 8th International Scientific

Conference for Health, Work and Social Responsibility, which I presented in September 2010. This was another opportunity to disseminate my research to the scientific and professional community.

Finally, I wrote an article entitled "How to build a better industry" in which I presented the findings of my research to the professional community. This was published in the August 2010 issue of the Nautilus Telegraph, an award-winning monthly newspaper with an international circulation of around 34,000 copies (Appendix Q).

7.2 **Whole Picture: Professional Knowledge**

In this section, I look at the whole picture now that I am at the end of the programme. I reiterate that I am not new to work based learning, having achieved a MSc degree in Work Based Learning Studies (Marine Operations and Safety Management) from Middlesex University in 2004. My work-based project for that degree was recognised as an example of good work (see Appendix J). My final project was a case study aimed at improving safety in offshore operations. A paper based on it was published in the *Seaway* magazine (De Rossi 2004). During that experience, I became fascinated by the processes involved in work-based learning, and when I finished my Masters I contemplated pursuing another degree in higher education. I decided to spend a few more years on my professional practice first, and then I applied to the Doctorate in Professional Studies programme (DProf) at Middlesex University. An extremely important aspect of the Middlesex University DProf is, in my opinion, that the learner is situated outside the academic sphere (Costley & Stephenson 2005), as a practitioner based in a work environment. I found this aspect of the programme crucial because I wanted to expand my existing area of expertise, and carry out research that would have an impact on my profession and make a contribution to my field.

Credibility, capability and continuous development (Stephenson *et al.* 2004) played a role in my choice of programme. My expectations from the DProf are to be recognised for the highest level of professional achievement, through a commitment to continuous learning and developing intellectual skills; in other words, I aim for a 'legitimisation of alternative forms of knowledge within the academy' (Bourner *et al.* 2001).

Moreover, I heartily concur with Lester's (2004) assertion that today's professional world demands an increasing commitment to and focus on field-based practice, rather than the more traditional (and, inherently, isolative) research model currently used for advanced degrees in many other disciplines. Furthermore, as a practitioner, I was not aiming only for a self-serving (and ultimately disjunctive) research model that made "a valid contribution

to existing practice" in any given field, but rather, to achieve a doctorate in professional development.

The pinnacle of my DProf studies was for me, certainly the project. My work-based investigation, as already mentioned, was embedded into my professional practice. This is the peculiarity of work-based research, which is an investigation with a practical aim to benefit the professional community. In this endeavour, I have used my knowledge, experience and skills to manage the project, especially when facing unforeseen events. Dealing with such unplanned events has greatly enhanced my project management skills.

Reflecting on the work I did over the course of my project, I realise that it has been on my mind constantly. I think that abandoning a piece of work for a long period of time can cause problems. Nevertheless, in order to maintain this constant involvement, I had to learn how to balance my professional activity, my personal life and my studies, so I learned to allocate my time, and manage my busy days in order to dedicate enough hours to my project. Often, during my time on the ship, the project and my professional activities were closely linked. For example, during safety meetings I was able to discuss safety topics that were useful for my project as well.

Managing this project has been a great learning opportunity. I not only had to design the research process but, most importantly, put it into practice. I found it challenging, for example, to carry out the interviews and focus groups in the work place. It was not easy to find the time between our busy work days, and moreover, as the Captain of the ship, I had to make it very clear that I was wearing my researcher hat in that context. This was definitely a task that took me outside of my 'comfort zone' but I have since realised that it helped me to build confidence in dealing with unfamiliar problems. It is often too easy to get used to simply dealing with the daily routine. This experience has widened my professional boundaries, enabling me to 'look over the fence' of my own practice. In fact, I found this fascinating. I discovered new ways of learning, for instance while networking with fellow DProf candidates.

With one particular candidate, I shared information about the programme structure, the RAL requirements and the oral presentation for the Programme Approval Panel (PAP). We initially started to communicate via email and asynchronously through the University's VLE (virtual learning environment). We then started to communicate synchronously through Skype, a free VoIP (Voice over Internet Protocol) software, which also permits videoconferencing. This tool enabled us to communicate in an effective way and, most importantly, in real time. I used this tool for a dummy presentation of my project proposal.

It was an effective way to test my presentation using a web-based videoconference very similar to the one I would use for the University PAP. We critically discussed the content as well as the structure of the presentation and this built my confidence.

I believe that, in collaboration or peer support, learners have two distinctive and alternate roles: 'peer supporter' and 'peer supported'. The roles are interchangeable and each peer acts as both supporter and supported during the relationship. To sum up, I explored this pedagogical paradigm with a fellow candidate. We reflected on the learning processes and on the peculiar approach to knowledge of the DProf programme, and this collaboration enhanced my critical thinking and research management skills.

To conclude, I feel confident that I will be able to tackle future projects under the Work Based Learning paradigm. The true value of this approach is that real problems are dealt with in the work place, underpinned by the solid academic background provided by this programme, and most importantly there is a practical outcome that is valued by organisations.

• Bibliography and References

ALERT (2008) *The International Maritime Human Element Bulletin*, The Nautical Institute
< http://www.he-alert.org/ >(Accessed June 2008)

Armsby, P. (2000). *Methodologies of Work Based Learning*. In Portwood, D. and Costley,
C. Work Based Learning and the University: New Perspectives and Practices. SEDA
Paper 109, p35-42

Armsby P. & Costley C. (2003) *Research Approaches Selected By Practioners-Researchers On A Professional Doctorate* VACE Conference Proceedings: Work Based
Learning Opportunities for Lifelong Learning, Cyprus 2003

Ball, D.J.(2000) "*Ships in the night and the quest of safety*", Injury Control and Safety
Promotion 2000 7 (2) pp.83 –96

Bailey, N., Ellis, N., Sampson, H. (2007) *Perceptions of Risk in the Maritime Industry:
Personal Injuries.* Lloyd's Register Educational Trust Research Unit Seafarers
International Research Centre (SIRC). Cardiff, Cardiff University < http://www.he-alert.org/documents/published/he00690.pdf> (Accessed July 2008)

Bell, J. (1999) *Doing Your Research,* (3rd Ed) Buckingham: Open University Press

Beck, U. (1992) *Risk Society: Towards a New Modernity*, London: Sage

Bem, D. J. (1972). *Self-perception theory*. In L. Berkowitz (Ed.), Advances in Experimental
Social psychology, Vol. 6, 1-62. New York: Academic Press

Blaxter L, *et al* (2001) *How to Research,* (2nd Ed) Buckingham: Open University Press

Blum, L. (1998). *Recognition, Value, and Equality: A Critique of Charles Taylor's and
Nancy Fraser's Accounts of Multiculturalism.* Constellations 5 (1):51-68.

Bourner, T., Bowden, R. and Laing, S. (2001) *Professional Doctorates in England.*,
Studies in Higher Education, 26 (1): 65–83.

Burns, D. 2007. *Systemic Action Research: A strategy for whole system change*. Bristol:
Policy Press.

Caulkins D.D., (1999) *Is Mary Douglas's Grid/Group Analysis Useful for Cross-Cultural
Research?* 1999; 33; 108 Cross-Cultural Research

Checkland P. (1999) *Soft Systems Methodology in Action* Chichester: John Wiley & Sons
inc.

Chynoweth, P. (2005) "*Professional doctorates in the built environment: how higher education responding to the changing needs of industry and the professions*" School of Construction & Property Management, University of Salford UK

Cohen L.,Manion L., Morrison K. (2000) *Research Methods in Educations,* New York: RoutledgeFalmer

Cooper, D.C. (1999) *Behavioural Safety: A Proven Weapon in the War on Workplace Accidents.* <http://www.sheilapantry.com/oshworld/focus/1999/199910.html>(Accessed June 2008)

Cooper, D.C.(2002) *Human Factors in Accidents*. Institute of Quarrying, North Of England- CoalPro Seminar, Ramside Hall, Durham, UK <http://www.b-safe.net/articles/bsms11.pdf>(Accessed June 2008)

Cooper, D.C. (2006) *The Impact of Management's Commitment on Employee Behaviour: A Field Study.* American Society of Safety Engineers, 7th Professional Development Conference & Exhibition, Bahrain, March 2006 <http://bsms-inc.com/Documents/Impact%20of%20Management%20Committment-Cooper-013.pdf> (Accessed June 2008)

Costley, C. & Armsby, P. (2007). *Work-based learning assessed as a field or mode of learning.* Assessment & Evaluation in Higher Education 32 (1), 21-33.

Costley, C., Stephenson, J. (2005) ,: "*The Impact of workplace Doctorates - a review of 10 case studies at Middlesex University suggests they promote candidates' personal credibility, capability and continuing development as well as their specialist expertise*" - Paper for AERA 2005

Cullen, the Hon. Lord (1990) *Report of the Public Inquiry into the Piper Alpha Disaster.* London: HMSO

Busta,P. Gibba, A., Pinkb, S. (2008) *Managing construction health and safety: Migrant workers and communicating safety messages.*, Safety Science, Volume 46, Issue 4, April 2008, Pages 585-602

Davies, C. A. (2008) *Reflexive Ethnography.* (2nd Ed.) London: Routledge

De Rossi, V. (2010) Captain's Column: *Clear away the jargon*. Seaways, 1, pp. 3

De Rossi, V. (2009c) *Has the 'global village' influenced the safety of our ships?* The International Maritime Human Element Bulletin [Online] June. 2009, Available from: http://www.he-alert.org/documents/published/he00810.pdf [Accessed 22nd June 2009]

De Rossi, V. (2009b) *The interaction of multicultural crew with safety management systems in Offshore Oil Industry.* in proceeding of the 4th International Conference on Services Management, Oxford Brooks University. May 2009 - ISBN: 978-0-9562609-0-1

De Rossi, V. (2009a) *Safety Management and Culture.* Reportism, The ISM Code Magazine, April 2009

De Rossi, V. (2004*) The quest for optimum safety.* Seaways, 6, pp. 15-16/21

De Rossi V. (2003) Unpublished M.Sc. Thesis: *Risk Assessment and Accident Hazard Study in the Drilling Industry.* London : Middlesex University

Doncaster, K.(1999) *The Middlesex University Professional Doctorate, a case study*. National Centre for Work Based Learning Partnerships School of Lifelong Learning and Education Middlesex University, 1999

Douglas, M. (2005) *Grid and Group, New Developments*, Workshop on Complexity and Cultural Theory in Honour of Michael Thompson, held at LSE on 27th June 2005

Douglas, M. (1992*) Risk And Blame : Essays in Cultural Theory* . London: Routledge

Douglas, M., Wildavsky, A., (1982) *Risk and Culture: An Essay on Selection of Technological and Environmental Dangers.* Berkeley: University of California Press

Douglas, M. (1978). Cultural Bias. Occasional Paper no. 35, Royal Anthropological Institute of Great Britain and Ireland.

Ellis, N., Sampson, H.(2003) *The Global Labour Market for Seafarers Working Aboard Merchant Cargo Ships* ,Cardiff: Seafarers International Research Centre (SIRC), Cardiff University < http://www.sirc.cf.ac.uk/pdf/GLM%20for%20Seafarers.pdf > (Accessed August 2008)

Enshassia,A. Burgessb,R. (1990) *Training for construction site managers involved with multicultural work teams*. International Journal of Project Management Volume 8, Issue 2, May 1990, Pages 95-101

Fetterman, D.M.(1988) *Ethnography, Step by Step.* (2nd ed.) London: Sage

Festinger, L. (1962) *Cognitive Dissonance*. Scientific American. October

Friedman, T. L. (2005). *The World Is Flat*. New York: Farrar, Straus and Giroux

Fraenkel, J. R., & Wallen, N. E. (2000). *How to design and evaluate research in education*. New York: McGraw-Hill

Giddens, A. (1986). *Constitution of society: Outline of the theory of structuration.* Los Angeles, University of California Press; (Reprint edition)

Glaser, B. (1992). *Basics of grounded theory analysis.* Mill Valley, CA: Sociology Press.

Glaser, B.; Strauss, A. (1967) *The Discovery of Grounded Theory. Strategies for Qualitative Research.* Hawthorne: Aldine De Gruyter

Glendon, A.I., Stanton N.A., (2000) *Perspectives on Safety Culture.* Safety Science - Volume 34, Issues 1-3, February 2000, Pages 193-214

Gross, J. L., &Rayner S.(1985). *Measuring culture: A paradigm for the analysis of social organization.* New York: Columbia University Press

Hendry, J. (1999a) *Cultural Theory and Contemporary Management Organization* .Human Relations, May 1999; vol. 52: pp. 557 - 577.

Hendry, J. (1999b) *An Introduction to Social Anthropology.* Houndmills: Palgrave

Hofstede, G. & Hofstede G.J. (2005) *Cultures and Organizations.(*2nd Ed) New York: Mc Graw-Hill

Horck, J. (2005) *Getting the Best from Multicultural Manning.* Malmo: World Maritime University

Hovdena, J. ,Albrechtsena, E., Herrerac, I.(2010) *Is there a need for new theories, models and approaches to occupational accident prevention?* Safety Science, Volume 48, Issue 8, October 2010, Pages 950-956

The Health and Safety Executive Statistics, 2009/2010 <ww.hse.gov.uk/statistics/overall/hssh0910.pdf> (Accessed February 2011)

IADC (2009) *Summary of Occupational Incidents.* International Association of Drilling Contractors < http://www.iadc.org/asp/2008%20Annual%20Report/2008%20ASP%20Annual%20Report%20for%20Industry%20Totals.pdf>(Accessed March 2010)

IADC (2008) *Summary of Occupational Incidents.* International Association of Drilling Contractors < http://www.iadc.org/asp/2007%20Annual%20Report/2007%20ASP%20Annual%20Report%20for%20Industry%20Totals.pdf >(Accessed October 2008)

IMO (2004) *International Convention for the Safety Of Life At Sea (SOLAS).* International Maritime Organization Publication

IMO (1994*) International Safety Management Code (ISM Code)* International Maritime Organization Publication

IMO Resolution A.880(21) (2002) *Implementation of the International Safety Management Code (ISM)* by 1st July 2002

IMO Resolution A.947(23) (2003) *Human element vision, principles and goals for the Organization* . Adopted by the 23rd Assembly in November-December 2003.

IMO Resolution A.891(21)(1999) *Recommendations on Training of Personnel on Mobile Offshore Units (MOUs).* Adopted 25 November 1999.

Kanter, R. M. (1993) *Men and Women of the Corporation*. New York: Basic

Kahveci, E., Lane, T., Sampson, H. (2002) *'Transnational Seafarer Communities',* Cardiff: SIRC Cardiff University

Kirk, J & Miller, M.L.(1986) *Reliability and Validity in Qualitative Research.* London: Sage

Knapp, S. (2006) *The Econometrics of Maritime Safety :Recommendations to enhance safety at sea.* PhD Thesis. Rotterdam, Erasmus Research Institute of Management (ERIM) http://publishing.eur.nl/ir/repub/asset/7913/EPS200796ORG9058921271KNAPPb.pdf (Accessed August 2008)

Krippendorff, K. (2004) *Content Analysis: An Introduction to Its Methodology.* 2nd edition, Thousand Oaks, CA: Sage

Kuo, C. (2007) *Safety Management and its Maritime Application.* London: The Nautical institute

Langford, I.H., Georgiou, S., Baterman I.J., Day R.J., Turner R.K., (1990) *Public Perceptions of Health Risks from Polluted Coastal Bathing Waters: A Mixed Methodological Analysis Using Cultural Theory.* Risk Analysis Volume 20 Issue 5, Pages 691 – 704

Lester, S. (2004). "*Conceptualising the practitioner doctorate*". Studies in Higher Education 29 (6), pp 750-777

Lester, S. (1999) *An introduction to phenomenological research.* <http://www.sld.demon.co.uk/resmethy.pdf> (accessed June 2008)

Lützhöft, M. (2004) "*The technology is great when it works": Maritime Technology and Human Integration on the Ship's Bridge*. Linköping, University of Linköping, Graduate School for Human-Machine Interaction <http://www.he-alert.org/documents/published/he00655.pdf > (Accessed July 2008)

Mars, G. (2008) *Corporate cultures and the use of space: an approach from Cultural Theory* .The European Journal of Social Sciences, Volume 21, Number 3, September 2008 , pp. 185-204(20)

McNiff, J. (2002) *Action Research Principles and Practice (*2nd Ed) New York: Routledge

Mead, M. (1949*) Coming of Age in Samoa.* New York: Mentor.

Mearns, K., Yulea, S. (2009) *Occupational Accidents and Safety: The Challenge of Globalization / Resolving multiple criteria in decision-making involving risk of accidental loss,* Safety Science*,* Volume 47, Issue 6, July 2009, Pages 777-785

Monaghan J. & Just P. (2000) *Social & Cultural Anthropology: A very Short Introduction.* Oxford: Oxford University Press

Morgan, D. L., & Krueger, R. A. (1998). *The focus group kit (vols. 1-6).* Thousand Oaks, CA: Sage.

Moon, J.A. (2004) *.A handbook of reflective and experiential learning: Theory and Practice*., RoutledgeFalmer

Ochienga, E., Priceb, A. (2010) *Managing cross-cultural communication in multicultural construction project teams: The case of Kenya and UK.* International Journal of Project Management Volume 28, Issue 5, July 2010, Pages 449-460

O' Reilly, K. (2005) *Ethnographic Methods. L*ondon: Routledge

Patton, M. Q. (2002). *Qualitative evaluation and research methods* (Third ed.). London: Sage Publications.

Pomeroy, V. (2006) *Perception and Management of risk-depence On People and System.* World Maritime Technology Conference

Prendergast, M.(2008) *Newcomers to Ireland: an evaluation of the challenges facing Irish organisations in the management of their multicultural workforces in terms of training and development.* PhD thesis, University of Leicester, Leicester, United Kingdom

Rex, J. and Drury, B., (1994). *Ethnic Mobilisation in a Multicultural Europe*. Aldershot: Avebury.

Rousseau, D.M. (1988) *The construction of climate in organizational research.* In C.L. Cooper and I.T. Robertson (eds), International Review of Industrial and Organizational Psychology. Chichester: Wiley

Santoso, D. (2009) *The construction site as a multicultural workplace: a perspective of minority migrant workers in Brunei* . Construction Management and Economics, Volume 27, Issue 6 June 2009 , pages 529 - 537

Song, S. (2010) *Multiculturalism*. The Stanford Encyclopedia of Philosophy (Winter 2010 Edition), Edward N. Zalta (ed.)

Schein, E.H. (2004) *Organizational Culture and Leadership* (3rd Ed.) San Francisco: Jossey-Bass.

Schön, D. (1983) *The reflective practitioner*. New York: Basic Books

Seel, R.(2000) *Culture and Complexity: New Insights on Organisational Change* Organisations & People Vol. 7 No 2; May 2000 pp 2-9

Skinner, B.F. (1974) *About Behaviorism.* New York: Random House Inc.

Sparks, R. (2001) *Degrees of Estrangement:: The Cultural Theory of Risk and Comparative Penology* .Theoretical Criminology, May 2001; vol. 5: pp. 159 - 176.

Stephenson J, Malloch M, Cairns L, Costley C, (2004):" *Towards a third generation of professional doctorates managed by the learners themselves?"* - Paper for Deakin University International Conference on professional doctorates

Suter, E. A. (2000, May*). Focus groups in ethnography of communication: Expanding topics of inquiry beyond participant observation*. [40 paragraphs]. *The Qualitative Report* [On-line serial], *5*(1/2). Available: http://www.nova.edu/ssss/QR/QR5-1/suter.html (accessed August 2009)

Sutherland, V., Makin, P., Cox, C. (2000) *The Management of Safety.* London: Sage Publications Ltd.

Steg, L., Buunk A.P., Rothengatter T., (2008*) Applied Social Psychology*. Cambridge : Cambridge University Press

Stranks, J. (2007), *Human Factors and Behavioural Safety.* Oxford : Elsevier Ltd

Taylor, C.(1994). *Multiculturalism: Examining the Politics of Recognition*. Princeton: Princeton University Press

Tiryakian, A. E. (2003) *Assessing Multiculturalism Theoretically: E Pluribus Unum, Sic et Non*. IJMS: International Journal on Multicultural Societies. 2003, vol. 5, no.1, pp. 20-39. UNESCO.

Thompson, M., Ellis, R., Wildavsky A., (1990) *Cultural Theory*, Cambridge: Westview Press

Thompson, R.J. (2008) *What Constitutes a Human Factor?* <http://www.he-alert.org/documents/published/he00715.pdf> (accessed July 2008)

Viscusi, W.K. (1996). *Rational Risk Policy*, New York: New York University press

Walzer, M.(1995) *Education, Democratic Citizenship and Multiculturalism* Journal of Philosophy of Education Volume 29, Issue 2, pages 181–189, July 1995

Wildavsky, A. & Wildavsky, A. (2008) .*Risk and Safety*. "The Concise Encyclopaedia of Economics. David R. Henderson, ed. Liberty Fund, Inc. 2008. Library of Economics and Liberty. <http://www.econlib.org/library/Enc/RiskandSafety.html> (accessed 1 February 2010)

Wildavsky, A. & Dake, K. (1990). *Theories of risk perception: Who fears what and why?* Daedalus, 119, 41-60.

Willett, C. (1998) *Theorizing Multiculturalism*. Oxford: Blackwell Press

Weber, M., (1968) *Economy and Society*, New York: Bedminster Press

Welch, T, Tanke, M., Glover, G.. (1988) *Multicultural Human Resource Management* Journal of Hospitality & Tourism Research February 1988 vol. 12 no. 2 337-345

Wenger E.,McDermott R.,Snyder W. (2002) *Cultivating communities of practice. A guide to managing knowledge.* Harvard: Harvard Business School Press

APPENDIX A

<u>Structured observation.</u>

This project aim to understand the interaction of multicultural crew with safety management system and if this influences the health and safety in the Oil Offshore Industry; the research is based on a Mobile Drilling Unit where the nationalities involved will be in the region of eighteen/nineteen and possible even more (Fig.2 on proposal).

The structured observation schedule adopted as qualitative data collection technique aim to concentrate on the "workplace culture"; the anthropologist Mary Douglas (1992) does not view this concept as "static" but on the contrary she affirms that it is a way of life created constantly by everyone involved in the organization, in other words it is the result of the daily activity, conversations and negotiation between members of the organization. I will definitely benefit of my insider researcher role as participant observer to understand the workplace culture from an "inside" perspective.

To comprehensively assess a "workplace culture", I believe that it is important to measure it, qualitatively in my research context, based upon an adequate model of culture. I propose the use of the Cultural Theory or Grid/Group theory (Appendix D) for this purpose.

I trust that often organizations do not recognize the variability in perceptions of risk between and among different groups; in addition Douglas (1992) affirmed that the Risk Perception is socially constructed.

Cultural Theory has been applied to studies related to risk perception, both in health related risks (Langford *et al,* 2000) and industrial safety (Gross & Rayner, 1985) with qualitative and mixed methodological approaches to identify factors that influence the way the risk is perceived.

The group/grid methodology is qualitatively measurable through the use of structured observations indices (adapted from Thompson *et al,* 1990; Douglas 1992; Langford *et al,* 2000) which can capture the two dimensions of the theory. With this strategy I aim to understand where in the two proportions of grid and group the observed multicultural workforce can be collocated. The theory expresses, based on the position of grid and group, four categories: individualist, egalitarian, hierarchist and fatalist. (Douglas, 1992: Thompson *et al,* 1990*)*

The measurable Group indices are as follow:

- ➢ Proportion of time spent in the group by a worker compared with other crewmembers.

- ➢ Frequency of meeting and/or "Think" plan (discussion and planning of operations)

- ➢ Closeness of connecting character links.

- ➢ The proportion of shared to unshared interest, job knowledge.

- ➢ Strength of the boundary of the group.

Measurable Grid indices are as follows:

- ➢ Is the style "egalitarian" or is there a clear leader?

- ➢ Are there underdogs and top dogs types in the observed group of workers?

- ➢ What are the theories of social justice that supports this distinction?

- ➢ Grid is high whenever roles are distributed on basis of social classifications such as:
- - age-grading
- - nationalities
- - sex

In the observation schedule, I have decided to structure the grid and group indices (table 1a) in order to qualitatively measure the position of the crewmembers in the two dimensions of the Cultural theory.

The workplace culture includes the Safety Culture of the multicultural crew, which is defined as follows:

"A belief, philosophy or faith held by groups or individuals on safety matters which is demonstrated in practice through the attitudes, actions and behaviour adopted by the people an organisation or a nation." (Kuo 2007)

The Safety Culture is observable by a researcher with an insider knowledge of he community of practice, he or she in fact will be able to qualitatively appraise specific characteristics such as shared attitudes, values, beliefs and practice of the people at work.

A positive example of workplace culture is when competent people put in practice their sound safety values, while an example of bad or weak workplace culture is when a group of persons or an organization adopt an indifferent approach to safety management.

I am interested in measuring qualitatively the risk behaviour types and for this purpose I will use the table adapted from Cooper (2002). For example, an action of a crewmember

attempting to lift a heavy weight using the crane, which is an operation very common in the daily activities of an offshore unit, with a lifting wire inadequate for the weight that is being lifted, is applicable as a risk producing behaviour. Again, if the employee or group of employees is wearing the proper personal protective equipment (PPE), this behaviour will definitely falls under a mitigating category.

Table 1a Structured Observation

Observation # _____

Data	
Time	
Location	

BEHAVIOUR TYPE: **Example**

Risk Producing	**Y / N**	Improper Lifting
Mitigating	**Y / N**	Wearing all PPE
Procedural	**Y / N**	Following procedures, plan, Risk Assessment
Supportive	**Y / N**	Reporting accidents
Safety Leadership	**Y / N**	Acknowledging safe behaviour

Measurable Groups indices:

Proportion of time spent in the group by crewmember(s) (High/Low group)	
Frequency of meeting and/or "Think" plan (discussion and planning of operations) (High/Low Group)	
Closeness of connecting character links High/Low group)	
Proportion of shared tasks and job knowledge.(High /Low Group)	
Strength of the boundary of the group (High/Low Group)	

Measurable Grids indices:

Leadership style, i.e. no clear leader "egalitarian" style (low Grid)	
A clear leader is identified (High Grid)	
"underdogs" in the group (High Grid)	
Individualist type, work alone type (Low Grid)	
The roles distributed on basis of social classifications such as age nationalities, sex (High Grid)	

APPENDIX B

Semi-structured interview.

This project aim to understand, by the mean of an ethnographic methodology, the interaction of multicultural crew with safety management systems and if this process influences the health and safety in the Oil Offshore Industry; the research is based on a drillship engaged in oil and gas exploration world wide.

One of the qualitative data collection techniques planned to be used in this research is the semi-structured interview (Cohen *et al,* 2000:270). I aim to set a framework of themes to be explored in a two-way communication; this allows the respondent the time and the scope to talk about a specific subject, with the objective to collect research's data. In addition, this technique is a way of getting data about feelings and emotions that can't be easily recorded during observations. Cohen *et al* (2000) suggest that this type of interview is useful to frame questions that will contribute to provide the knowledge sought. In addition this qualitative data collection technique allows the respondent to talk in depth and in detail about the given topics. Here complex subject can be clarified, picking up issues that may not surface during observations; it is also easy to record these interviews with a tape recorder for future analysis. Unstructured interviews (Bell 1999:138) may produce a wealth of valuable data but they require a great deal of expertise to control and a great deal of time to analyse, therefore I trust that the choice of the semi-structured interviews is the more appropriate in the research context.

In light of the research's questions and in order to contextualise and frame the topics I elected to explore, I have divided the interview in five categories, based on the arguments explained in detail here below.

Section 1

In this first section, my aim is to qualitatively measure the understanding of "safety" as a concept, I am interested in comprehend participants' opinion, how do they define this notion, do they see this as a value, as a priority or else? In addition, in this first section I am interested in exploring the reaction, if any, at the company safety Vision, which is "*Operations conducted in an incident-free environment, all the time, everywhere".* I trust that it is an important step in the research's context, whether the multicultural crew is aware of the safety vision. This is the goal set by management with regards to safety, can it be achieved if it is not known or worst understood?

Section 2

In this section I aim to measure the understanding of the hazard identification, which is defined as the potential to lead to harm. I am interested in exploring this concept because I believe that if it is not understood, the whole safety management system is in jeopardy. Hazard identification is the very first step in an offshore oil environment, the lacking of this appreciation will make virtually impossible to assess a risk involved in the operations. If the participant is not able to understand this concept most likely he or she will not be able to identify hazards involved in the operation.

Section 3

This part links with the previous one; in specific here I aim to gauge the understanding of the Risk, which is defined as the probability of harm being realised. The orthodox approach would be first to identify the hazard, then to assess the risk. Often the two terms are confused; I want to explore these concepts to understand if there is a biased perception which could have an impact on safety management. Therefore section 2 and section 3 are conceptually linked and cover important issues that deserve to be explored in the research context.

Section 4

Here I aim to understand if the respondent has an understanding of the health and safety management system, and whether he or she is committed to it. I am also interested to understand the view of the multicultural participants about the management commitment to the safety system, as the literature suggests that this commitment impact employees safety behaviour by anywhere between 35 to 51 percent (Cooper 2006). In addition, in this section I am trying to understand if a "cognitive dissonance" (Festinger 1962) is experienced. (See proposal p.3)

Section 5

With this final section, I intend to understand if the workforce feels accountable for the health and safety, in other words I want to appreciate if they are aware of their role played in the safety system. The company expectation is a pro-active approach to the safety system; this is done by empowering the employees with the authority to stop any unsafe act. Is this reality? The last question of this section regards, if applicable, the impact of incidents in the participant's life.

Semi-structured interview.

- Introductions, ice break session, explain the purpose of the research.
- Guarantee of confidentiality.
- Explain that there are no right or wrong answers.
- Ask for permission to take notes, offer to show the notes at the end of the interview.
- Ask permission to use a tape recorder.

- Section 1 Understanding of "Safety" as a concept.

- A1 What do you understand by the word "Safety"?
- A2 Do you know the Safety Vision of the Company?
- A3 Do you believe that it is achievable? If not, why?
- A4 Can you give me an example of good safety in you work, and explain why and how it is good?
- A5 Can you give me an example of bad safety in your work, and explain why and how is it bad?

- Section 2 Understanding of "Hazard Identification".

- B1 What do you understand by the word "Hazard"?
- B2 Can you give me an example of an Hazard?
- B3 Do you identify hazards prior to start a job?

- Section 3 Understanding of "Risk Assessment".

- C1 What do you understand by the word "Risk"?
- C2 Can you give me an example of a Risk?
- C3 Do you assess a Risk prior to start a job? If yes, how?
- C4 What type of Risk is acceptable for you, and why?

- Section 4 Management of Health and Safety

- D1 Does the company have policies and procedures for Safety?
- D2 Can you mention a policy?
- D3 Do you believe your Senior Management Team are genuinely interested in improving your Safety Culture? Can you give me an example?
- D4 Do you believe your direct Supervisor genuinely attempt to improve your Safety Culture?
- D5 Do you have a monitoring process in the Company?
- D6 Do you feel you are pressured to take short cuts in your daily activity? If so, why?

- Section 5 Responsibility of Health and Safety

- E1 Do you have any obligation in regards with Health and Safety?
- E2 What would you do if you see an unsafe act?
- E3 Did you experience any incidents in your working life?

Cultural Theory of risk

One of my aims in this research, is to classify qualitatively the risk perceptions of the multicultural workforce, it is my intention to do it through the use of the Cultural Theory of risk (Douglas & Wildavsky 1982). Risk perception is the subjective judgment that people make about the characteristics and severity of a risk, which is defined as the probability of harm being realised. Several theories have been proposed to explain why different people make different estimates of the probability of risks, and two major families of theory have been developed by social scientists: the Psychometric Paradigm and Cultural Theory. Cultural theory refers to theories of risk perception that focus on culture, rather than individual psychology as an explanation for differences in risk judgments, thus I consider this theory appropriated for my project.

Cultural Theory arose from the work of Mary Douglas, she argued that social structures differ along two principal axes: "grid" and "group." *Grid* refers to the degree to which individuals' choices are circumscribed by their position in society. *Group* refers to the degree of solidarity among members of the society. These dimensions were based on the work of the classic sociologist Emile Durkheim.

Douglas and Wildavsky (1982) introduced the concept of grid/group to the risk analysis community and this typology has been very influential in the field of risk perception research. It proposes four major biases:

•**Individualist**

Low grid and low group. That is, their choices are unconstrained by society and they lack close ties to other people. They value individual initiative in the marketplace, and fear threats like war that would hamper free exchange. The individualist view of nature is described as cornucopian or resilient. Like a ball resting at the bottom of a cup, nature will return to its original stable position after any disturbance. Thus, individualists embrace trial-and-error, as they have confidence that the system will fix itself in the end.

•**Egalitarian**

Low grid and high group. They live in voluntary associations where everyone is equal and the good of the group comes before the good of any individual. In order to maintain their solidarity, egalitarians are sensitive to low probability-high consequence risks (such as nuclear power), and use them to paint a picture of impending apocalypse. Risk and Culture was, in part, a polemic against the environmental movement, which Douglas and

Wildavsky saw as sharing the worldview and social organization of religious cults. Egalitarians see nature as fragile, like a ball balanced precariously on an overturned cup. Any small disturbance will send it crashing down. Thus egalitarians advocate the precautionary principle and cling to traditional ways of life that have proven to be sustainable, rather than risking disaster by trying new technologies.

• **Hierarchist**

High grid and high group. A hierarchist society has a well-defined role for each member, like the caste system in India. Hierarchists believe in the need for a well-defined system of rules, and fear social deviance (such as crime) that disrupts those rules. Hierarchists see nature as "perverse/tolerant": it can be exploited within certain limits, but if those limits are exceeded the system will collapse. They thus rely heavily on experts, who can identify those limits and establish rules to keep society within proper bounds.

•**Fatalist**

High grid and low group. They feel isolated in the face of an external world imposing arbitrary constraints on them. They view nature as a ball on a flat surface, rolling randomly in any direction. Thus, they feel that there is little they can do to control their situation, and resign themselves to riding out whatever fate throws at them. Because of their passive stance, fatalists are often excluded from Cultural Theory analyses

There is also a fifth asocial *Autonomous* perspective.

The hermit who withdraws from social interaction is described as having an autonomous way of life. Because so few people fit this description, and it is by definition not a viable basis for a society, it is often ignored in Cultural Theory analyses.

Graphical representation of the Cultural Theory
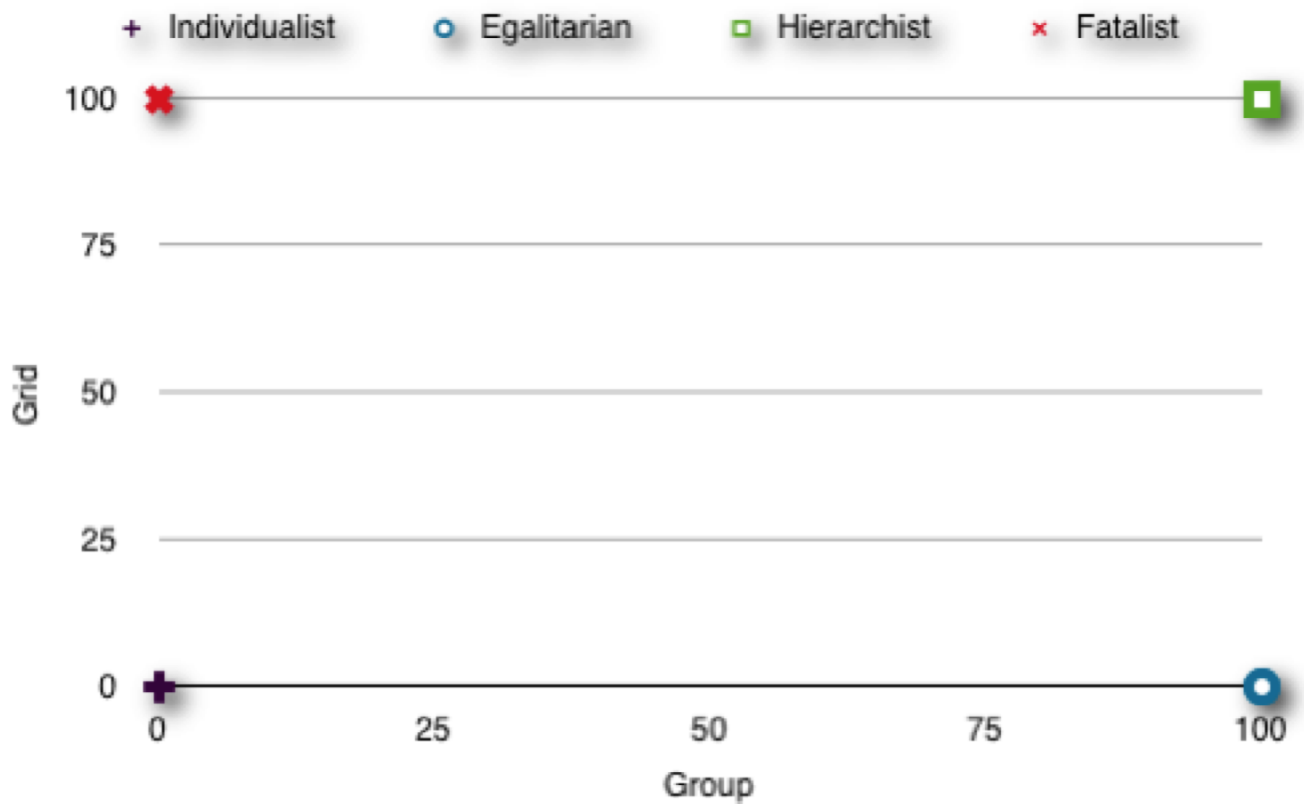
A P P E N D I X   D

Evidences of the interest shown by professional organisations to my proposed project.

1. Extract from the correspondences with Commodore David Squire, editor of the
    Alert, the International Maritime Human Element Bulletin, a Nautical Institute
    project, sponsored by Lloyd's Register Educational Trust, to improve the
    awareness of the human element in the maritime industry.

From: David Squire <editor@he-alert.org>
Date: Tue, 23 Sep 2008 08:11:42 +0100
To: Valerio De Rossi <v.derossi@dpoperator.com>
Subject: Re: Research in the Offshore Oil Industry

Dear Captain De Rossi,

Many thanks for letting me know. I will look forward to seeing the
results of your research.

Kind regards

David

Commodore David Squire CBE, FNI
Editor
Alert!
The International Maritime Human Element Bulletin
The Nautical Institute
202 Lambeth Road
London
SE1 7LQ

Tel/Fax: +44 (0) 1282 814998
MoB: +44 (0) 7866 313491

editor@he-alert.org

www.he-alert.org

----- Original Message -----
From: Valerio De Rossi <mailto:v.derossi@dpoperator.com>
To: editor@he-alert.org
Sent: Sunday, September 21, 2008 3:04 PM

Subject: Research in the Offshore Oil Industry

Dear Commodore Squire,

I would like to inform that I am pursuing a Professional Doctorate at
the Middlesex University in London, researching the interaction of the
Human Element, composed by the multi-cultural crew working on mobile
offshore drilling units (MODU's), with the Safety management system.

Multicultural crews in this industry are an irreversible trend and I
believe that studying and analysing the interactions between people's
behaviours and the working environment will improve the health and
safety at sea.

Please find attached an abstract of my research proposal; I do hope that
I can disseminate my findings also through Alert!, the International
Maritime Human Element bulletin.

Kind regards, Valerio De Rossi

Capt. Valerio De Rossi MSc, MNI
          Master Mariner

E-mail: v.derossi@dpoperator.com

---

2. Message from Mr. Andrew Linington, editor of the Nautilus Telegraph, the
   union for maritime professionals.

_____

From: Telegraph <telegraph@nautilusuk.org>
Date: Fri, 17 Oct 2008 11:04:56 +0100
To: Valerio De Rossi <v.derossi@dpoperator.com>
Subject: RE: Research in Health and Safety

Dear Capt Rossi

Very many thanks for taking the time and trouble to contact the
Telegraph.

I am sorry for the delay in replying, but I have been out of the
office for a few days and had only limited email access.
Your research sounds absolutely fascinating, and I think it will
be of immense relevance to our readers, as well as having much
significance within the Nautilus campaigning on health, safety and
human factor issues.

So, we would very much welcome access to your findings and I would
be delighted to disseminate them to the wider world via the
Telegraph.

With best wishes
Andrew

Andrew Linington
Editor, Nautilus Telegraph

alinington@nautilusuk.org
direct: +44 (0)20 8530 1681
tel: +44 (0)20 8989 6677
fax: +44 (0)20 8530 1015

Nautilus UK
Oceanair House
750-760 High Road
Leytonstone
London E11 3BB
www.nautilusUK.org

---

3. Message from Mr. Mahapatra, Head of Maritime Training & Human Element
Section at the International Maritime Organization (IMO).

From: Ashok Mahapatra <AMAHAPAT@imo.org>
Date: Mon, 24 Nov 2008 09:48:40 +0000
To: Valerio De Rossi <v.derossi@dpoperator.com>
Subject: Re: Research in Health and Safety in the Offshore Industry

Dear Capt de Rossi,

Thank you for your email. I am sure that we would welcome any research into health and safety in
the maritime sector. However, I would like to inform you that IMO does not have any funds to
support any research projects. Funding for research projects are done through Member
Governments.

With best regards

Ashok Mahapatra
Head
Maritime Training & Human Element Section
Telephone:+44 207 587 3212
Fax: +44 207 5873210

"Important Notice: Although we endeavour to ensure that the information provided is up to date

and accurate, you are advised to contact your national administration which is the appropriate channel for dissemination of IMO information. Addresses are available from our website at http://www.imo.org in the "National Contacts" area."

>>> Maritime Knowledge Centre 24/11/2008 08:55 >>>
Dear Captain de Rossi,

Thank you for your e-mail. I am forwarding it to Mr Mr Ashok Mahapatra who heads the Maritime Training and Human Section at IMO.

With best wishes from IMO.

Yours sincerely,

Marianne Harvey (Mrs)
Head,

Maritime Knowledge Centre, 4 Albert Embankment, London SE1 7SR, U.K.
Tel: 44 (0) 207 587 3164 Fax: 44 0 207 587 3236
IMO Website: http://www.imo.org <http://www.imo.org/>
The Library database is searchable at: http://www.imo.org/library .

>>> Valerio De Rossi < v.derossi@dpoperator.com > 23/11/2008 18:14 >>>
Dear IMO,

My name is Valerio De Rossi and I am presently engaged in a doctoral research with the Institute of Work Based Learning at the Middlesex University in London.

The aim of the project is to investigate the interaction of the human element, composed by the multi-cultural crew working on mobile offshore drilling units (MODU's) with the safety management system. Multicultural crews in this industry are an irreversible trend, the literature reports that approximately 65 percent of the world merchant fleet have adopted multinational crewing strategy and I believe that studying and analysing the interactions between people's behaviours and the working environment will improve the health and safety at sea. The fact that human factors are cause of accidents at sea in the region of fifty to ninety percent highlight the importance of such project, which may have international resonance in the drilling and maritime industry.

The literature suggests that the human factor plays an important role in the safety system, this is quite obvious, but the assumption that if only employees would do as they are told no accidents would occur is, in my opinion, very reductive. The Human Behaviour has a direct influence on safety, and although it is a wide area of study, I will concentrate with the behaviour of people at work. In 2007, the offshore oil industry has suffered five fatalities, 445 medical treatment cases and 277 restricted work incidents. (IADC 2008)

In the community I intend to study the human resources are formed by

heterogeneous and multi-cultural employees dealing with the Safety Management system, and I believe that it is important to understand why incidents occur and try to explain the accident involvement and the safety performance in terms of attitude, behaviour, safety climate and organizational culture.

 Main Research Question(s)

My research will try to answer at the following main questions:

1. How the interaction's process among the Human Element composed by multicultural crew and the Safety Management Systems influences the Health and Safety in the Offshore Oil industry?

2. How individuals have interpreted and put in practice the Safety Culture adopted by the Company?

3. What the crew really expect in term of safety performance?

4. How the multicultural crew perceive the risks?

5. Is "zero incidents" a plausible goal?

My interests in specific are:
- find out qualitatively how the multicultural workforce understand the safety system'
- classify qualitatively the Risk Behaviour Types and the Risk perceptions of the multicultural workforce
- match the empirical findings concerning a multicultural workforce's understanding of Safety system' and the Safety Vision's understanding of these.

I hope, with this project, to contribute to the "good practice" on maritime Safety Management as my research will improve the understanding of the multicultural Human Element interacting with safety systems and I will be more than happy to share my findings with the IMO in order to disseminate them in the Industry.
Could you please inform if such research could be of interest for the IMO.

Yours truly,
Captain Valerio De Rossi MSc, MNI
Master Mariner
E-mail: v.derossi@dpoperator.com
Cell.: + 39 335 53 80 403

A P P E N D I X E

Participant Information Sheet

Research Project Title: "Health and Safety in the Offshore Oil Industry"

Introduction:

The purpose of this research project is to analyse the interaction of the multicultural crew with safety management systems in the offshore oil industry, with the aim to improve the health and safety of the community of practice.

Information about Participants' Involvement in the Research

Participants accepting the invitation to take part in the research will be involved in the process of in-depth interview and observations with their permission as data collection methods. Analysis of interviews and observations is based on the ethical agreement between the researcher and the participants. The researcher will keep a research diary with the aim to gain insights on research process and to record reflection in action; the data will be treated strictly confidential.

Benefits

The research would benefit the whole community of practice and hence the participants as well. The greater benefit is to improve the safety in the offshore operations with the aim to achieve an incident-free work place.

Risks

No risks to participants are anticipated. As mentioned above, all steps of collecting data will be taken to guarantee confidentially and privacy. Participants may voluntarily withdraw from the study if they choose to do so.

Confidentiality

Data gathered in the research study will be kept confidential. All the data will be stored in the researcher's residence. No participant shall be mentioned by name in any written or oral presentation of the findings. Pseudonyms will be used. If there is information that participant prefer to keep in confidence or information that might jeopardize confidentially, that information will be deleted from the data analysis.

Contact Information

If you have questions at any time about the study or the procedures, you may contact the researcher, Valerio De Rossi at: VD152@mdx.ac.uk

Participant Consent Form

Research Project Title: "Health and Safety Management in the Offshore Oil Industry

Researcher's Name: Valerio De Rossi

- I have read the Participant Information Sheet and the nature and purpose of the research project has been explained to me. I understand and agree to take part in research.

- I understand the purpose of the research project and my involvement in it.

- I understand that I may withdraw from the research project at any stage and that this will not affect my status now or in the future.

- I understand that while information gained during the study may be published, I will not be identified and my personal results will remain confidential.

- I understand that data will be stored at the researcher's residence

- I understand that I may contact the researcher if I require further information about the research, if I wish to make a complaint relating to my involvement in the research.

Signed …………………………………………..(Research Participant)

Print name …………………………………….. **Date** ……………………

A P P E N D I X F

Extract of the correspondence with my colleague Capt. Marco Saba, a practicing Master Mariner in command of Mobile Offshore Drilling Units (MODU) in the Offshore Oil Industry. I have discussed with him my research proposal, as I trust that his vast experience in multicultural context makes his advice valuable. He assessed my schedule ratings and in addition Capt. Saba was willing to discuss the future steps of my research, as it will develops. This strategy was beneficial for my research's reliability, as I was able to discuss my data analysis and findings with a colleague within my practice who gave me an independent evaluation of my work.

------------ ----------- ------------- ------------

Subject: Re: Research Proposal
Date: Friday, January 2, 2009 7:16 PM
From: Marco Saba <saba.marco@gmail.com>
To: Valerio De Rossi <v.derossi@dpoperator.com>
Conversation: Research Proposal

```
Dear Captain Valerio,

first of all congratulation for your research which I found extremely
interesting. It is the first time that Safety is investigated and
focused according the interaction of multi-cultural elements. It is
true : today onboard not only MODU units but also on merchant ships,
it is easy to find large numbers of different nationalities which
means different cultures and different points to approach life. In
this contest every human factor plays an important role in the safety
system. Risk perception ( as you mention on your research ) is an
important safety factor which is tightly linked to the personal
culture and environment of each individual.

I will be pleased to continue to receive your future steps on your research.

Your faithfully,
Capt. Marco Saba


2008/12/22 Valerio De Rossi <v.derossi@dpoperator.com>:
> To: Captain Marco Saba , Master "Pride South Atlantic"
>
> Dear Marco,
>
> As discussed, I am presently pursuing a Professional Doctorate (DProf) at
> the Middlesex University Institute of Work Based Learning, my research
> interest lies in studying the interaction of the Human Element, composed by
> multicultural crews working on a mobile offshore drilling units (MODU's)
> with the safety management systems. Multicultural crews are an irreversible
> trend and I aim to understand how their interaction with safety management
> systems influences the health and safety in the Offshore Oil Industry.
```

>
> The research will be a qualitative study with an ethnographic approach, the
> target group is the multicultural offshore oil community and I will use
> observations and interviews as data collection techniques. In light of your
> experience in the oil offshore industry in multicultural contexts, I would
> kindly ask you to assess my schedule ratings, as this will strength the
> reliability of my project.
>
> In addition, I would like to continue our collaboration during my data
> collection and analysis phase, so to have the possibility to share my
> analysis with a colleague within my practice.
>
> Please find attached my project proposal.
>
> Thank you in advance and best regards, Valerio
>
>
> Captain Valerio De Rossi
> Master "Dhirubhai Deepwater KG1"
> (Cell   +82-(0)10-6731-6280
>) Office +82-(0)55-630-2850
> *   v.derossi@dpoperator.com
>
>
>
>

A P P E N D I X   G

Coding Frame

Risk Behavioural Types

Code	Unit of Meaning	Description
1B	Risk Producing	Behaviour which produces Risk such as an improper lift.
2B	Mitigating	Mitigating controls which lessen the consequences of potential incident or accident, such as barrier tapes, Personal Protective Equipments.
3B	Procedural	Follows company policies and procedures, elaborate plans, identify hazards and assess Risks.
4B	Supportive	Supports the safety management system, for example reporting incidents.
5B	Safety Leadership	Demonstrating a clear leadership in Safety, for example acknowledging safe behaviours.

Group

Code	Measurable Groups Indices	Description
1G	Proportion of time spent in the group by crewmember(s)	An extended period of time spent in the group by crewmember(s) indicates High Group
2G	Frequency of meeting and/or "Think" plan (discussion and planning of operations)	The frequency of meetings and/or discussion, planning indicates High Group
3G	Closeness of connecting character links High/Low group)	Closeness between members indicates High Group
4G	Proportion of shared tasks and job knowledge.	Shared tasks and/or job knowledge indicates High Group
5G	Strength of the boundary of the group	The strength of the boundary of the group indicates whether there are High or Low Group.

Grids

Code	Measurable Grid Indices	Description
1I	Leadership style, i.e. no clear leader "egalitarian" style (low Grid)	The leadership style indicates whether there is a High or Low Grid. No clear leader indicates an "egalitarian" style with Low Gird.
2I	A clear leader is identified (High Grid)	A Clear Leader indicates a High Grid indices
3I	"underdogs" in the group (High Grid)	"Underdogs" present in the group indicates High Grid.
4I	Individualist type, work alone type (Low Grid)	An individualist type of person indicates Low Grid
5I	The roles distributed on basis of social classifications such as age nationalities, sex (High Grid)	If roles are distributed on basis of social classification, High Grid indicators

A P P E N D I X H

"The interaction of multicultural crew with safety management systems in Offshore Oil Industry"

Valerio De Rossi, Institute of Work Based Learning at Middlesex University

Vd152@live.mdx.ac.uk

1.0 Introduction

The globalisation had an impact in the Health and Safety aspect of many industries. Safety is a hot topic in today's world market, it is evident that every industry is putting a lot of effort in making the work places safer, and this for many different reasons. Surely big corporations face the ethical dilemma of standing on a social ground where it is not acceptable by today's society to see employees, and hence member of the society, suffer from incidents while working. I would add that the endeavour of avoiding incidents is also dictated by marketing reasons and more pragmatically for the cost involved in dealing with unfortunate events. Again, a safe company is surely more "marketable" than competitors with poor safety records. Policy makers are constantly developing new rules and regulations trying to set a framework within the workers should be able to practice their trades in an incident-free environment. The globalisation has surely added another ingredient to the already complex issue; we are moving from the local village to a global, borderless market and this has been crucial in creating a multicultural environment.

1.1 Project background

The Offshore Oil Industry, as many other industries, is constantly putting efforts in making its operations safer. Big interests are involved and safe records are now carefully scrutinised in order to remain successful in the fiercely competitive energy market. A big corporation cannot afford incidents and accidents for the reasons earlier mentioned as its performance is measured in safety terms, there is no successful operation if it is not also safe and incident-free. This work-based project focused in exploring the health and safety of the offshore oil industry in a multi-cultural environment, more precisely in the field of upstream oil sector or exploration and production (E&P). This is the very sector where the energy operators develop oil and gas drilling exploration campaigns worldwide. Here technology is paramount, the exploration is moving on deeper and deeper water depths, what was a wild dream a decade ago is now the norm and equipments and crews are working at the cutting edge of the know-how. Mobile offshore Drilling Units (MODU's) are exploring oceans hundreds of miles off the continental shelf; the world fleet is expanding year after year in the search of energy supply for the world needs. The globalisation has affected very much this industry, the very nature of the worldwide explorations has helped the flexibility of the global human resources market, and this has created during the years a multicultural community bounded by the expertise in the oil and gas industry.

2.0 Project's Aim and Rationale

The rationale of this work-based project is to improve the health and safety in the industry, tackling the problem from a cultural point of view. First of all the question should be, is there a problem in the industry? What are we going to investigate? Well, despite the set of rules and regulations laid down to regulate the health and safety in the Industry, my

interest in exploring this topic is based on the number of incidents and accidents that are still taking place; In 2007 the drilling offshore industry has suffered five fatalities, 445 medical treatment cases and 277 restricted work incidents. (IADC 2008) The thought of lives lost during the exercise of a profession is unbearable in today's society, in my opinion this problem deserve a thorough effort and I for one want to contribute in achieving a safer working place. The high numbers of incidents and accidents suggest that something must be done in reducing drastically these figures, perhaps the lack of cultural awareness may play a role, and tackling the problem from a different prospective may shed some light in this very articulate matter. The different prospective suggested is to stance at the issue from a cultural point of view; in fact many studies on health and safety have been carried out during the years focusing on psychology, (see for example the work of Stranks 2007, Sutherland *et al* 2000, Cooper 1999 and 2002) rather than on multicultural diversity, where instead I want to put the emphasis.

Another paradigm worth to mention is the work-based concept of this research, the Institute for Work Based Learning has developed an innovative approach to personalised learning for full-time professionals who are also, in the research context, practitioner researchers. In fact, a formal learning agreement is signed by the stakeholders defined as the University, the doctoral candidate and a representative of the professional practice. In this particular instance the researcher is a Master Mariner serving in the community of practice under study.

This project aim to understand the interaction of multicultural crew with safety management system and if this interface influences the health and safety in the Oil Offshore Industry; the research is based on a ultra-deepwater Mobile Offshore Drilling Unit (MODU) engaged in oil and gas exploration worldwide where the nationalities involved are in the region of twenty in a crew of 172 persons.

3.0 Multicultural Reality

Multicultural crew in the maritime world is an irreversible trend, Kahveci *et al* (2002) reports that approximately 65 percent of the world merchant fleet have adopted multicultural strategy. The recent study of Bailey *et al* (2007) proposes that nationality is the most significant factor in determining perceptions of risk at sea: this study underpin, if needed, the concept that multi-cultural crews have a heterogeneous perceptions of risks thus a possible impact on health and safety. In addition the fact that human factors are cause of accidents at sea in the region of fifty to ninety percent (Kuo 2007, Horck 2005, Thompson 2008, Sutherland *et al* 2000) highlights the importance of this project, it is worth to mention that every study reports an involvement of the human element at some point in the causal chain.

In order to comprehensively assess a "workplace culture", I heavily draw from the work of the Anthropologist Mary Douglas (1921-2007); my argument is based on the concept that I need to measure, qualitatively in my research context, the multicultural environment based upon an adequate model of culture. What I propose therefore is the use of the Cultural Theory or Grid/Group theory (Douglas 1982; Thompson *et al* 1992), which is a two-dimensional framework of cultural comparisons that comprehend four distinctive ideologies or values. The work of Douglas had a wider influence outside the discipline of social anthropology; she is widely cited in diverse disciplines such as political science, policy studies, organizational theory and risk management. Her Cultural theory has been applied to predict perceptions of risk (Thompson *et al.* 1990), both in health related risks (Langford *et al*, 2000) and industrial safety (Gross & Rayner, 1985) with qualitative and mixed methodological approaches to identify factors that influence the way the risk is perceived.

This project addresses the variability in perceptions of risk between and among different groups, Douglas (1982) affirmed that the Risk Perception is socially constructed; this is often unrecognised in modern organisation with multi-cultural employees. Although working in a multi-cultural environment maybe be a big effort, it can also be seen as a way of cultural enrichment, as one early definition of culture by Edward Tylor (1871 Quoted Monagham & Just 2000) is the *"accumulation of human accomplishment"*. The German-American anthropologist Franz Boas (1858-1942) defined as the father of American Anthropology, described this value as a set of cultural glasses lens that provide us with a means for perceiving the world around us, I believe that the latter definition is indeed applicable in the offshore community. Personal experiences suggested that often the set of cultural glasses are quite different as well as the perception of the world for different communities.

Culture is a concept that has been studied for long time and it has been defined in different ways and often used with different meaning, even as a *"way of life".* For instance when we refer to the "American Culture" or the "Japanese Culture", these terms implicitly suggest a particular perception of the world and hence a way of life. In the Cultural Theory, Thompson *et al* (1990) define the "way of life" as a combination of cultural bias and social relations: the former referred to shared values and believes, and the latter definition is a pattern of interpersonal relations.

4.0 Significance of the Work Based Project

I trust that investigating the interaction of the human element, composed by the multi-cultural crew working on mobile offshore drilling units (MODU's), with the safety management system and its influences on the health and safety in the Oil Offshore Industry is definitely beneficial for the Industry. This project is not only providing a different prospective in dealing with safety concept, it is also developing the literature on and for a specific professional "Community of Practice" (Wenger *et al* 2002), formed by multicultural human resources engaged in a process of collective learning in a shared domain of human endeavour. Cultural awareness in this globalised world is not only recommended but it should also be mandatory and hopefully the International Maritime Organization (IMO) and offshore regulatory bodies will acknowledge this need and set the framework to develop training courses for practicing seafarers and oil offshore workers.

5.0 Research Approach and Data Collection Techniques

The study is a qualitative research with an ethnographic methodology carried out as an insider work-based researcher, in order to collect and analyse data on how the globalised, multicultural offshore workers understand their activities and their involvement in the safety management system, with strong emphasis on the fieldwork that I will carry out as a participant observer. (Fetterman 1998, Kirk & Miller, 1986, O'Reilly 2005).

Because of the aims and the qualitative nature of the research, I have chosen three main data collection techniques; structured observations, semi-structured interviews and a research diary. With these techniques, my objectives are to classify qualitatively the risk perceptions of the multicultural workforce through the use of the Cultural Theory of risk (Douglas & Wildavsky 1982), to determine the risk behaviour types (Cooper 2002) and the understanding of the safety systems.

5.1 Project Report

I will develop a manual for safety management system in an offshore multicultural environment, which will focus on culture; I will also build up a safety management training scheme for professionals. In addition there will be dissemination in form of papers and articles through the company, national and international Professional Bodies and the

Union for maritime professionals (Nautilus), who has founded my project of great relevance to improve the industry's health and safety culture.

References:

Bailey, N., Ellis, N., Sampson, H. (2007) Perceptions of Risk in the Maritime Industry: Personal Injuries. Seafarers International Research Centre (SIRC). Cardiff, Cardiff University

Cooper, D.C. (1999) Behavioural Safety: A Proven Weapon in the War on Workplace Accidents. <http://www.sheilapantry.com/oshworld/focus/1999/199910.html>(Accessed June 2008)

Cooper, D.C.(2002) Human Factors in Accidents. Institute of Quarrying, North Of England- CoalPro Seminar, Durham

Douglas, M., Wildavsky, A., (1982) Risk and Culture: An Essay on Selection of Technological and Environmental Dangers. Berkeley: University of California Press

Fetterman, D.M.(1988) Ethnography, Step by Step. (2nd ed.) London: Sage

Giddens, A. (1984) The constitution of Society. Cambridge : Polity Press

Gross, J. L., &Rayner S.(1985). Measuring culture: A paradigm for the analysis of social organization. New York: Columbia University Press

Horck, J. (2005) Getting the Best from Multi-Cultural Manning. Malmo: World Maritime University

IADC (2008) Summary of Occupational Incidents. International Association of Drilling Contractors

Kahveci, E., Lane, T., Sampson, H. (2002) 'Transnational Seafarer Communities', Seafarers International Research Centre (SIRC). Cardiff, Cardiff University

Kirk, J & Miller, M.L.(1986) Reliability and Validity in Qualitative Research. London: Sage

Kuo, C. (2007) Safety Management and its Maritime Application. London: The Nautical institute

Langford, I.H., Georgiou, S., Baterman I.J., Day R.J., Turner R.K., (1990) "Public Perceptions of Health Risks from Polluted Coastal Bathing Waters: A Mixed Methodological Analysis Using Cultural Theory". Risk Analysis Volume 20 Issue 5, Pages 691 – 704

Monaghan J. & Just P. (2000) Social & Cultural Anthropology: A very Short Introduction. Oxford: Oxford University Press

O' Reilly, K. (2005) Ethnographic Methods. London: Routledge

Stranks, J. (2007), Human Factors and Behavioural Safety. Oxford: Elsevier Ltd

Sutherland, V., Makin, P., Cox, C. (2000) The Management of Safety. London: Sage Publications Ltd.

Thompson, M., Ellis, R., Wildavsky A., (1990) Cultural Theory , Cambridge: Westview Press

Thompson, R.J. (2008) What Constitutes a Human Factor? The International Maritime Human Element Bulletin <http://www.he-alert.org/ documents/published/he00715.pdf> (accessed July 2008)

Wenger E.,McDermott R.,Snyder W. (2002) Cultivating communities of practice. A guide to managing knowledge. Harvard: Harvard Business School Press

A P P E N D I X   I

OXFORD
BROOKES
UNIVERSITY

PENNSTATE
1 8 5 5

IIMT
OXFORD
BROOKES
UNIVERSITY
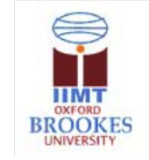
This is to certify that

Valerio De Rossi

Attended and Presented at the:

The 4th International Conference on Services Management

Managing Services Across Continents

on: 8-9th May 2009

Dr Levent Altinay
Reader in Strategic Management in the Service Industry
Oxford Brookes University Business School

A P P E N D I X   J

Professional Development Foundation

Sharing our passion for learning

Professional Development Foundation Enterprises (Ltd)
39 Harvey Lane Norwich NR7 OBZ

Telephone: (0)1257 400197
Email: enquiries@pdf.net
Website: www.pdf.net

Middlesex University

1 October 2009

Dear Cpt. Valerio De Rossi

We contacted you yesterday to request permission from you to use an extract from your Master's Project Report, as an example of good work to be used by Head of Research at Middlesex for a research book they are producing.

You have very kindly agreed to this request and we now require you to officially sign this letter, stating that, and return it to Dr Annette Fillery-Travis, at the above address in the top left hand corner. (In your case, Cpt. Valerio, you told me that as you were at sea you would sign the letter digitally and return it electronically and additionally send the postal copy when possible.)

May I take this opportunity, on behalf of Middlesex University, to thank you for being part of this research.

Kind regards

Carole Ferro
Carole Ferro
Client Manager
Professional Development Foundation
+44 (0)1257 400197
carole.ferro@pdf.net
www.pdf.net

I hereby give permission for extracts from my Master's Project Report to be used anonymously by the Head of Research at Middlesex University in compiling their research book.

Name (printed): VALERIO DE ROSSI   Signed: _____

Date: 2 October 2009

A P P E N D I X K

'Safety Management and Culture'. Reportism, The ISM Code Magazine, April 2009

Dr Anderson is supervising a DP drillship Master, Captain Valerio De Rossi as he undertakes a work-based Doctoral study into the possible effects of culture on safety management. Here Captain De Rossi summarises his project.

Safety Management and Culture

As a Master Mariner in command of dynamic positioned drillships engaged in oil and gas exploration worldwide, I am very interested in the safety aspect of our operations: this is one of the reasons why I am involved in a work-based research carried out in partial fulfilment of the requirements for the Doctorate of Professional Studies at the Middlesex University in London, Institute of Work Based Learning.

The research is an investigation of the interaction of multicultural crews with safety management system and its influence on the health and safety in the Oil Offshore Industry. I believe that globalisation has had an impact on the Health and Safety aspect of many industries, we are moving from the local village to a global, borderless market and this has been crucial in creating a multicultural environment.

This is not new in the shipping industry, the study of Kahveci et al (2002) reports that approximately 65 percent of the world merchant fleet have adopted multicultural strategy, which is an irreversible trend in the maritime world. The very nature of the worldwide explorations has helped the flexibility of the global human resources market, and this has created during the years a multicultural community bounded by the expertise in the oil and gas industry.

The recent study of Bailey et al (2007) proposes that nationality is the most significant factor in determining perceptions of risk at sea: this study underpins, if it were needed, the concept that multi-cultural crews have a heterogeneous perception of risk, thus a possible impact on health and safety. It is unfortunately well known that human factors account for between 50 to 90 % of accidents at sea and every study of safety management reports an involvement of the human element at some point in the causal chain.

I argue that the risk perceptions among different cultural groups are dissimilar, based on the assumption that this perception is socially constructed. My professional experience suggests that there is a lack of cultural awareness and inaccurate stereotyping among the multicultural crews. Many studies on health and safety have been carried out during the years focusing on psychology, rather than the area I am investigating, "multicultural diversity".

Again, the literature highlights that despite the substantial attention devoted by management and scholars to the organisational culture, there are still few attempts of bringing cultural theories of social anthropology into the management arena.

Although there are sets of rules and regulations laid down to regulate the health and safety in the Offshore Industry, incidents and accidents are still taking place; In 2007 the drilling offshore industry suffered five fatalities, 445 medical treatment cases and 277 restricted work incidents. (IADC 2008) The thought of lives being lost during the exercise of a profession is unbearable in today's society, in my opinion this problem deserves a thorough effort and I for one want to contribute in achieving a safer working place.

In brief, my aim with this project is about minimizing occupational causalities in the offshore industry by exploring the determinants of work practices of multi-ethnic and multi-cultural crews in the peculiar working condition of the offshore oil industry. While also investigating the social science paradigms of human action and cultural diversity, relying heavily on ethnographic methodologies and qualitative data collection techniques.

The research is based on a study of the crew of an ultra deep-water Mobile Drilling Unit (MODU) engaged in oil and gas exploration worldwide where the nationalities involved are in the region of twenty with a total crew of 172 persons.

Captain Valerio De Rossi MSc, MNI
Vd152@live.mdx.ac.uk

References:
Bailey, N., Ellis, N., Sampson, H. (2007) Perceptions of Risk in the Maritime Industry: Personal Injuries. Cardiff, SIRC Cardiff University
IADC (2008) Summary of Occupational Incidents. International Association of Drilling Contractors
Kahveci, E., Lane, T., Sampson, H. (2002) 'Transnational Seafarer Communities', Cardiff: SIRC Cardiff University

CAPTAIN'S COLUMN

A maiden voyage

Captain Valerio De Rossi MSc, MNI

I have recently had the privilege of assuming command of a latest generation dynamically-positioned (DP) drillship, 96,000 tonnes at loadline, equipped to work in water depths of up to 12,000 feet (3,657 m), outfitted to construct wells up to 35,000 feet (10,688 m).

The ship was built at the Samsung Heavy Industries Shipyard in Geoje Island, South Korea. I was assigned to the construction project months before she was ready. I was involved in the last part of the building and then in the commissioning phase on behalf of the owner: it has been a stimulating experience. The commissioning stage was undoubtedly beneficial for the owner, not only to ensure quality control but also to guarantee that the ship was ready to operate after delivery by performing comprehensive system integration tests on the sophisticated drilling, power management and dynamic positioning systems.

As a mariner, I often feel that I could have made some useful contribution to a ship's design. Although it is virtually impossible to change anything once the contract has been signed between the owner and the shipyard, here I had the satisfaction of giving my input on a few things. There was, for example, a talk-back system on the bridge far from the DP control, making it practically impossible to use. I persuaded the construction team to move it to a more suitable position. I also asked for brackets for the portable thrusters' control station on the bridge wings to be manufactured and I got involved in the office layout – all small stuff but it made me feel that I have done my part, that the ship has a little bit of my contribution.

The ship's length of 228 metres makes her impressive: I appreciate her size and the latest technology, both for the drilling package and the DP system. She has also a dual drilling capability: her derrick can be equipped with two travelling blocks, which allow multiple operations such as drilling and preparing off-line pipes or casings for the next section saving time and money.

Below deck, her three separate engine rooms, each equipped with two main diesel generators of 7,000 Kw, give her a total power of 42,000 Kw and triple redundancy. Each feeds two 5,500 Kw variable speed Rolls Royce thrusters, making her a really powerful DP vessel. This is a safe design – each engine room is independent and a black-out would stop only two generators and two thrusters, leaving the other four running. There would be minimum impact on the ship's station-keeping.

Maiden voyage

I joined the vessel in Busan, South Korea, for her maiden voyage to Johor Bahru, Malaysia, where we would load materials prior to commencing exploring off the coast of India. The voyage plan stipulated a SSW course, passing between Korea and Japan and proceeding south, sailing through the China Sea, then passing west of Taiwan, China towards the Singapore Strait.

It is a nice feeling walking on a brand-new ship, even if the amount of new equipment on board requires an extensive training period. The crew attended numerous courses months before the ship was ready, but a 'hands-on' experience is surely required before the crew is fully conversant with this type of technology.

The crew was 172-strong. We still had warranty engineers, client representatives and technical support on board and every bunk was occupied. After the port clearance and the necessary paperwork, we finally left Busan anchorage. We carried out a stowaway search and an ISPS drill to ensure we were fully compliant with US Coast Guard MARSEC Security level 1, while a muster drill was conducted to ensure that the crew was familiar with their muster station, as everybody was new on the vessel. Mustering 172 people is quite a challenge but I had a total head count in a decent time, so I was pleased – but surely more training is required. Weekly fire and abandon drills are scheduled, with additional exercises for the emergency teams.

I set four main engines at about 75 per cent of their maximum power, generating approximately 21,000 Kw and six thrusters at 85 per cent of their maximum speed. This configuration gave us an average speed of over 9,5 knots and a consumption of about 100 cubic m of heavy fuel oil: quite a lot but what we were expecting.

The weather forecast wasn't very good: low pressure was building along our course; but as we approached Taiwan, China the weather improved and thanks to the regular speed, my ETA resulted to be correct. This was crucial for our shore-based support in organising the resources needed on arrival. We were quite busy on the bridge: the traffic was increasing as we approached Singapore and we were enjoying the passage, when suddenly numerous Navtex messages brought me back to the reality of an additional threat to us mariners – pirate attacks in the Strait.

It is often said that history is cyclical and probably two centuries ago our ancestors would have had the same fears, but one would hope that by now, these threats would be over. Unfortunately, for complex social and economic reasons, pirates have come out of the history books and are now a real concern to us. However a sharp look out was reinforced both on deck and on the bridge (with such a big crew this wasn't a problem) and we got through without incident.

Once in the Strait we reduced speed to manoeuvre in these busy waters; from the autopilot we transferred the thrusters control to the manual joystick, which enabled the OOW to direct the huge vessel with high precision. We arrived at the anchorage off Johor Bahru and we finally stopped in 29 m of water; I really did not want to go any shallower with a draught of 13 m.

A few days after our arrival we had internal ISM and ISPS audits, so my hands were really full; but in preparing the handover notes to my relief, I reflected on this very busy but also stimulating time. It was good to be back in the deep blue after the shipyard period and be the master of this powerful ship on her maiden voyage, surely a professional memory that will remain with me throughout my career.

CAPTAIN'S COLUMN

Clear away the jargon

Captain Valerio De Rossi MSc, MNI

'**B**uzz words' and technical jargon are widely used in many businesses and the maritime industry is no exception. In fact, I find that the jargon in maritime safety is now so consolidated that we don't even notice it anymore. Every company has a 'safety vision' (which in buzz-free words, is the goal set by management to achieve its safety objectives). Clearly every company is aiming for zero incidents, so slogans such as 'Nobody gets hurt', 'Safety first' and the alike are often painted on our ships.

When sailing the high seas with these shiny slogans displayed on our vessels we, as masters, are held accountable by the owners to ensure that the 'safety vision' is achieved. Among our many duties we are filling in spreadsheets using KPIs (or key performance indicators, to use more trendy jargon) trying to quantitatively measure the safety performance of our vessels – which are often unmeasurable in quantitative terms. One, two or three first aid cases recorded on a spreadsheet give only a sterile indication for the whole picture. This is because, in my opinion, the safety culture of a vessel is not easily expressed by numbers alone: qualitative methods are often more suitable to articulate these concepts in a wider and more effective way.

However, in order to consider our vessel 'safe', and therefore in line with the 'vision' set by our management, we need to take into consideration many variables that are involved in the equations. The factor that stands out in almost every incident investigation is the interface of the human element with safety management systems. I am referring here to the 'software' part of the equation, which is the most unreliable and at the same time the most fascinating: the human element. 'Human element' is, mind you, another safety jargon term. It is the expression we use to define the human beings, the persons, in short the crews, of our vessels who are the ones interfacing with the 'hardware' part of the safety management system, composed of policies and procedures.

I am very interested in the human element – or perhaps I should simply say that I am interested in our crews who are manning our vessels: this is because I consider them the most important asset for any company and therefore the most important asset of a ship. To explore this fascinating and challenging human element factor, I talk a lot to crew members when I am at sea. I am, however, aware of the particular nature of my crew of 170 strong, which represents a truly international and multicultural environment with more than 25 nationalities. This is not applicable to all vessels but I believe there is common ground in what I am writing and perhaps a lesson to be shared among colleagues.

I often wonder if the safety jargon is a barrier to safety performance. In my conversations with the crew of the DP drillship I have the privilege to command, I ask many questions, especially to junior crew members about our safety management system, seeking to uncover their knowledge of it. I specifically ask questions about hazard identifications and risk assessments.

It is important to reiterate the definition of those two terms, in order to contextualise the concepts. I define a hazard as a situation with the potential to lead to harm, and a risk as the probability of harm being realised. Professor Kuo, in his book published by the Institute, *Safety Management and its Maritime Applications*, (2007) defines hazard as 'something that can lead to undesired outcomes or harm in the process of meeting an objective' and, pragmatically, risk as 'a measure of a hazard's significance involving simultaneous examination of its consequence or severity of the outcome and the probability of occurrence'.

I also looked for some fresh definition of risk, trying to see it from a different angle, outside the traditional occupational safety framework. Risk assessments are used in many applications and in a variety of different environments, I would like to suggest here the definition of the anthropologist Mary Douglas who expressed the concept of risk as follows: 'A risk is not only the probability of an event but also the probable magnitude of its outcome'.

Obviously the hazard identification and the assessment of the risks involved are at the base of an effective safety management system – the question is, are these concepts understood by our crews?

The definitions given here are very powerful and eloquently expressed and in many maritime safety management systems the same concepts are very well articulated through policies and procedures. I always wonder, though, if these concepts are grasped by people whose first language is not English, or with a limited level of education. Do we use expressions such as 'management of change', 'energy source' and 'mechanical lifting', to mention just a few often present in our manuals in our everyday vocabulary? I honestly doubt it.

In conversations with crew members, I sometimes doubt that these concepts are truly and thoroughly understood. For example, when I recently asked for a definition of 'hazard', I have had many responses such as 'The hazard is the "unknown" and can be everywhere', or 'Hazard and risk are the same thing'.

Puzzled by these answers, I asked a particular young crew member if 'management of change', another jargon phrase, was applied in his daily tasks in order to control and reduce the risk to ALARP (as low as reasonably practicable), as per company policy. After a blank look, he shook his head. Then I asked again: what would you do if you are painting and another person came along to help you out? Well, he said, I will explain to him what the task is, where the paint is stored, what type of personal protective equipment we are using and what my supervisor told me to do. Great, I told the young man, you have just explained to me very well what 'management of change' is in your daily activity. The change was a new member coming into the task and this change was managed very well.

So the bottom line is, should we revise our manuals in order to clear the jargon and make them seafarer friendly?

CAPTAIN'S COLUMN

Risk perception

Captain Valerio De Rossi MSc, MNI

I strongly believe that the duty of any master is to strive to make ships safer and seas cleaner while practising the profession in a profitable way for the company he or she is working for. I am very interested in the safety aspects of marine operations, so I felt quite disappointed when I looked at the safety statistics that pertain to my business sector, the offshore oil industry. I noted that, sadly, in the last two years, from 2007 to 2008, the fatalities increased significantly, from five to nine, which means that the number of people killed almost doubled.

This is a very loud warning bell. Safety statistics in general report that the human element accounts for between 50 to 90 per cent of accidents at sea, and virtually every incident investigation reports an involvement of the human element at some point of the causal chain.

Studying the data, it is evident that the theoretically perfect safety management systems required by the ISM Code to ensure safe ship operations have, somehow and somewhere, failed. It is also evident that all the barriers metaphorically placed to prevent incidents and mitigate consequences have also failed with the contribution of the most unreliable machine, the human element.

A recent study by Margareta Lützhöft – *Seaways*, June 2005; also, type in 'The technology is great when it works' into the search box www.diva-portal.org – demonstrated that trying to fix human error by incremental improvements in technology have turned out to be largely ineffective, due to the adaptive compensation by the user.

These considerations suggest that perhaps a different approach to safety could assist in improving the aforementioned dramatic statistics.

As a master of dynamic positioned (DP) drillships, I find myself at the sharp edge of the practice: hear this warning bell loudly. The question that I pose is, shall we pay attention to this warning and perhaps think out of the box in order to find a fresh approach to safety?

I would like to describe an operation that I observed on board my drillship, which could be an emblematic example of the interaction of the human element with safety management systems. This DP drillship was engaged in drilling an exploration well about 70 nautical miles off the west coast of India. An offshore support vessel (OSV) arrived on location. It was decided to perform a ship-to-ship operation, to offload cargo from the OSV by the means of our starboard crane. The OSV established communication with the drillship before entering the safety zone, 500 metres from us; comprehensive checklists were ticked off and applicable procedures followed to the letter.

The support vessel manoeuvred to approach our starboard side: both vessels were controlled by the means of DP systems. Differential Global Positioning Systems (DGPS) and ultra-deepwater hydro-acoustic reference systems were used by the drillship's DP system. Sophisticated DGPSs and a laser positioning fan-beam reference system were used by the OSV's dynamic positioning to determine the exact vessel's position. This state of the art technology allowed the OSV's officer of the watch to maintain his vessel a few metres from our starboard side.

Once the OSV was sitting steadily alongside the drillship, communications were established between the drillship's crane operator and the OSV OOW. The crane operator manoeuvred the knuckle boom crane over a container, which was hooked up by the OSV deck crew. Then the crane operator started to lift the 10 foot container up to the drillship.

A crew member on board our vessel, who was not involved in the operation, saw the lifting; he felt it was unsafe as the load was swinging, due to the ship's motion. He then called a 'time out for safety', a safety tool used in my company to prevent unsafe acts but the crane operator did not stop the action. The crew member tried to stop the operation a few more times, there finally the crane operator landed the container on the main deck. The crew member was very angry because he had been told on several occasions that he had the right to stop every unsafe job, and he really felt that was the case here. Apparently the crane operator ignored him or at least this was his perception. They were of different nationalities.

The matter was brought to my attention and I decided to call the crane operator and the crew member who stopped the operation for a discussion together. I asked the crane operator for his version of the story. He said that what the colleague articulated was correct; however he was committed to lowering the container on deck and could not stop, as the load would swing even more due to its inertia. To clarify the matter I then asked both of them if we could use the metaphor of an aircraft taking off: once the pilot is committed to lift off, he cannot stop the aircraft as there is the so-called 'point of no return'. Both of them agreed on the example and the issue was finally resolved there, as they understood each other's position and perception of the event.

My question now is, was the perception of risk equal for both participants? I would answer, definitely not. The crane operator lifted the container because this operation was within his risk tolerance, while the crew member who stopped it had a different perception. The point I want to make with this example, is that risk perception may be heterogeneous, that is, a system with a number of structural variations, and socially constructed. Cultural and anthropological theories explain that people choose what to fear and how to fear, based on their cultural diversities and differences. The issue now is, should we bring these theories into maritime safety management?

Scholars affirm that it is possible to predict and explain what kind of people will perceive which potential hazards to be dangerous. In other words, it would be possible to determine how risk is perceived by different groups of people. I suggest that further investigation should be devoted to these concepts in an effort to make our ships safer and to stimulate an international debate on policies and professional practices.

A P P E N D I X O

Cross-Cultural Safety Consciousness Method - Graphical representation

Introduction:

In this quick guide it is proposed the practical implementation of the Cross-Cultural Safety Consciousness (CCSC) Method, by the use of a structured observation table.

Instructions:

Each observation is recorded with a numerical value from 1 to 5, where 1 indicates the minimum and 5 the maximum.

The observer will fill in the structured observation table with the observations' data for both the grid and group determinants.

Only the green cells needs to be filled in, it is important to enter the number of observations, the programme will calculates the graphs automatically.

The programme calculates automatically whether the determinants are High or Low, which are shown on a table under the graphs.

Structured observation table:

The structured observation table provides the observer in the field with measurable group and grid indices, each item is coded from 1G to 5G for the Group, and from 1I to 5I for the Grid determinants.

The descriptions help the observer to give a numerical value from 1 to 5, where 1 indicates the lowest value and 5 the highest value.

Measurable Groups/Grid indices:

Code	Measurable Groups Indices	Description
1G	Proportion of time spent in the group by crewmember(s)	An extended period of time spent in the group by crewmember(s) indicates High Group
2G	Frequency of meeting and/or "Think" plan (discussion and planning of operations)	The frequency of meetings and/or discussion, planning indicates High Group
3G	Closeness of connecting character links High/Low group)	Closeness between members indicates High Group
4G	Proportion of shared tasks and job knowledge.	Shared tasks and/or job knowledge indicates High Group
5G	Strength of the boundary of the group	The strength of the boundary of the group indicates whether there are High or Low Group.

Code	Measurable Grid Indices	Description
1I	Leadership style, i.e. no clear leader "egalitarian" style (low Grid)	The leadership style indicates whether there is a High or Low Grid. No clear leader indicates an "egalitarian" style with Low Gird.
2I	A clear leader is identified (High Grid)	A Clear Leader indicates a High Grid indices
3I	"underdogs" in the group (High Grid)	"Underdogs" present in the group indicates High Grid.
4I	Individualist type, work alone type (Low Grid)	An individualist type of person indicates Low Grid
5I	The roles distributed on basis of social classifications such as age nationalities, sex (High Grid)	If roles are distributed on basis of social classification, High Grid indicators

Cross-Cultural Safety Consciousness Method - Graphical representation

Number of Observations: 150

Code	Total Value	Measurable Groups Indices
1G	100	Proportion of time spent in the group by crewmember(s)
2G	102	Frequency of meeting and plan (discussion and planning of operations)
3G	89	Closeness of connecting character links(High/Low group)
4G	78	Proportion of shared tasks and job knowledge.
5G	95	Strength of the boundary of the group

High determinant when > 75

Low determinant when < 75

| Code	Total Value	Measurable Grid Indices
1I	20	Leadership style, i.e. no clear leader "egalitarian" style (low Grid)
2I	41	A clear leader is identified (High Grid)
3I	23	underdogs in the group (High Grid)
4I	18	Individualist type, work alone type (Low Grid)
5I	35	The roles distributed on basis of social classifications such as age nationalities, sex (High Grid)

Grid Indices
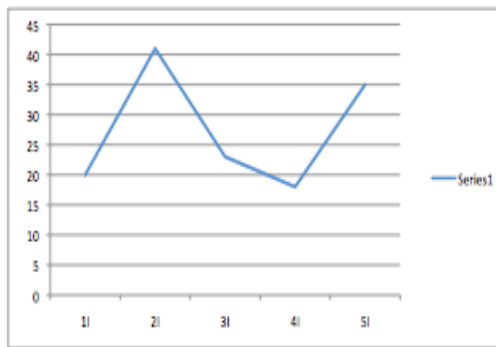
High

Low

Group Indices
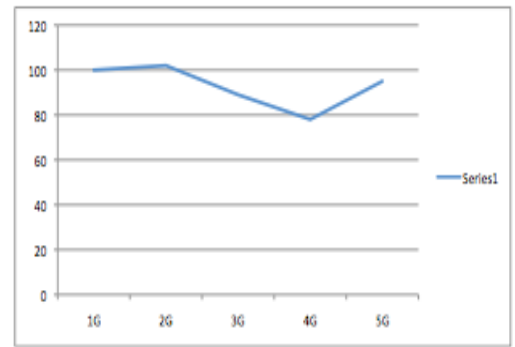
High

Low

Calculated Determinants

1G	High
2G	High
3G	High
4G	High
5G	High

Way of Life:

High/Low	Fatalist
High/High	Hierarchist
Low/High	Egalitarian
Low/Low	Individualist

Calculated Determinants

1I	Low
2I	Low
3I	Low
4I	Low
5I	Low

A P P E N D I X P

Has the 'global village' influenced the Safety of our ships?

Captain Valerio De Rossi MSc, MNI

Vd152@live.mdx.ac.uk

The Human Element is mentioned periodically in every safety statistics as it accounts for between 50 to 90 % of accidents at sea, in addition every incident's investigation reports an involvement of the human element at some point in the causal chain.

Many studies have been carried out to investigate this issue in the shipping industry in different terms, such as the impact of new technology, lack of training, psychological factors just to mention few of them.

I trust that the globalisation has had an impact on the Health and Safety aspect of many industries, we are moving from the local village to a global, borderless market and this has been crucial in creating a multicultural environment. This is not new in the shipping industry, a recent study reports that approximately 65 percent of the world merchant fleet have adopted multicultural strategy, which is an irreversible trend in the maritime world. The very nature of the worldwide trades has helped the flexibility of the global human resources market, and this has created during the years a multicultural community bounded by the expertise in the maritime practice.

A survey carried out in 2007 by the Seafarers International Research Centre at Cardiff University proposes that nationality is the most significant factor in determining perceptions of risk at sea: this underpin my proposition that multi-cultural crews have heterogeneous perceptions of risks and thus a possible impacts on health and safety behaviours.

I trust that there is variability in perceptions of risk between and among different cultural groups, cultural studies highlight that the risk perception is socially constructed; this is often unrecognised in modern organisation with multi-cultural employees.

My professional experience suggests that there is a lack of cultural awareness and still wrong stereotyping among the multicultural crews; in my opinion the multicultural diversity

and its influence on the health and safety in the maritime industry has not been investigated thoroughly. Interesting enough, despite the substantial attention devoted by management and scholars to the 'organizational culture', there are still few attempts of bringing cultural theories of social anthropology into the management arena.

In brief, I do believe that the culture, defined in many ways such as the 'accumulation of human accomplishment' and as a set of cultural glasses lens that provide us with a means for perceiving the world around us, plays a big role in the safety management. I trust that the cultural concept is a very powerful tool, which I founded very useful in understanding modern organization. In fact in order to make sense of situations biased by our own assumptions, it is necessary to take a cultural perspective, learning to see the world through *"cultural lens"*.

The word "culture" in most Western languages means civilization or "refinement of the mind" and that the result of such refinement of the mind includes education, art and literature, however it is argued that the cultural stability, especially in the Western world, is short lived, as homogeneity is achieved with difficulty and is always about to dissolve.

Managers often speak of developing "the right kind of culture", this suggests that the word "culture" is used in a superficial and perhaps incorrect way with the assumption being that there is are "good" and "bad" cultures. In realty, the culture of a group is what personality or character is for an individual, the way we see people is mainly through their personality traits and behaviour. The former can be broadly defined as what a person *is*, the latter as what a person *does.* This concept is also true for a culture, in fact we can observe the behaviours of the group in a particular culture, but very often we cannot see what really constrain it, which is what really matter the most.

In a complex society, individuals belong to many different organizations and therefore a given cultural unit is in reality a complex set of overlapping subcultures. Just to mention one model that we always bring to any new group situation is our own model of family, which is the group were we spend most of our early life.

The concept of organizational culture has been extensively studied in the last two decade, and it is widely acknowledged that this concept is critical to determine an organization's success or failure.

In the organizational culture framework it is possible to appreciate how the values, attitude and beliefs about safety are expressed and how these influences the organisation directions. In the Offshore Oil Industry the disaster of the Piper Alpha in 1988 rapidly and

dramatically highlight the importance of these values and the term of 'safety culture' arose by its own right in this industry as well as in the general opinion, in this case after the disaster of the nuclear power station in Chernobyl in 1986.

Cultural Theories have a wider influence outside the discipline of social anthropology, they have been applied in diverse fields such as political science, policy studies, organizational theory, risk prediction and management, industrial safety, theoretical criminology and even in information systems risk management strategies.

I trust that it is now time to bring these theories into the maritime industry, Health and Safety is a key concern in today's world of work, every industry is putting a lot of effort in making the work place safer, for a variety of reasons. Big corporations face the ethical dilemma of standing on a social ground where it is not acceptable by today's society to see employees, and hence member of the society, suffer from incidents while working. I would add that the endeavour of avoiding incidents is also dictate by marketing reasons and more pragmatically for the cost involved in dealing with unfortunate events. Again, a safe company is surely more "marketable" than competitors with poor safety records. Policy makers are constantly developing new rules and regulations trying to set a framework within the workers should be able to practice their trades in an incident-free environment. Globalisation has surely added another ingredient to the already complex issue; I trust that an effort should be made to investigate its impact on the health and safety aboard our ships.

A P P E N D I X   Q

Paper published to The Telegraph August. 2010, Vol.43, N.8, p.32-33

SAFETY AT SEA

Captain Valerio De Rossi, left, believes he has devised a new system to improve safety in the offshore oil industry.

In this **special report** he explains how it could help cut accidents and injuries in the sector...

How to build a better industry

Gas from the damaged Deepwater Horizon wellhead is burned by the drillship Discoverer Enterprise Picture: US Coast Guard

I am a practising master mariner in command of dynamic positioned drillships engaged in oil and gas exploration worldwide and I have recently carried out work-based research in partial fulfilment of the requirements for the Doctorate of Professional Studies at Middlesex University's Institute of Work-Based Learning.

My research interest lies in the interaction of multicultural crews with safety management systems and its influences on health and safety in the offshore oil industry. The research is based on an ethnographic study of the crew of an ultra deep-water mobile drilling unit (MODU) engaged in oil and gas exploration worldwide, where the nationalities involved are in the region of 20 within a total crew of 172.

Health and safety is a key concern in today's world of work. Every industry is putting a lot of effort in making the workplace safer, for a variety of reasons. Big corporations face the ethical dilemma of standing on a social ground where it is not acceptable in today's society to see employees suffer from incidents while working. Considerable national and international legislation has been passed since the second world war in the maritime world, setting health and safety norms — but I would add that the endeavour of avoiding incidents is also dictated by marketing reasons and, more pragmatically, for the cost involved in dealing with unfortunate events. A safe company is surely more 'marketable' than competitors with poor safety records.

Globalisation has added another ingredient to the already complex issue; we are moving from the local village to a global, borderless market and this has been crucial in creating a multicultural environment.

Multicultural crews in the maritime industry in general, and in the offshore oil sector in particular, are an irreversible trend. Recent studies show that approximately 65% of the world merchant fleet has adopted a multinational crewing strategy. Moreover, human factors account for between 50% to 90% of accidents at sea, and virtually every study reports an involvement of the human element at some point in the causal chain.

I was therefore interested to understand how this interaction influences health and safety aboard our ships. A recent investigation suggested that nationality is the most significant factor in determining perceptions of risk at sea, and my study investigated the proposition that multicultural crews have heterogeneous perceptions of risks and that this has possible impacts on health and safety behaviours.

In the upstream oil sector, technology is paramount and exploration and production are moving into greater and greater water depths. What was a wild dream a decade ago is now the norm, and equipments and crews are working at the cutting edge of know-how, with DP MODUs now exploring hundreds of miles off the continental shelf.

Globalisation has radically affected this industry. The very nature of worldwide exploration has helped the flexibility of the global human resources market, and this has created over the years a multicultural community bounded by the expertise in the sector.

In my research I addressed the variability in perceptions of risk between and among different groups, based on the theoretical framework laid down by the anthropologist Mary Douglas (1921-2007), who affirmed that the risk perception is socially constructed. This is often unrecognised in modern organisations with multicultural employees.

However, the question now is: **how is safety in the offshore oil industry?** I looked at the International Association of Drilling Contractors (IADC) statistics, which report that in 2007 the offshore oil industry suffered five fatalities, 445 medical treatment cases and 277 restricted work incidents. In 2008 the numbers of fatalities increased to nine, medical treatment cases to 459, and restricted work incidents to 279.

The 2009 statistics have yet to be published. However, 2010 has brought the tragic incident in the Gulf of Mexico, involving the explosion and subsequent sinking of the DP drilling rig Deepwater Horizon, which caused the death of 11 crew members and probably the greatest ever environmental pollution at sea.

The thought of loss of lives during the execution of a profession is unbearable in today's society, and I for one want to contribute in achieving a safer workplace. The high numbers of incidents and accidents suggest that something must be done to drastically reduce these figures. Perhaps the lack of cultural awareness and multicultural diversity may play a role, and tackling the problem from this perspective may shed some light on this issue.

Culture is a dynamic concept which can take different shapes and meaning, but in broad terms it has been defined as a 'way of life'. The concept of organisational culture has been extensively studied in the last two decades, and it is now widely acknowledged that this concept is critical in determining an organisation's success or failure. Scholars suggest that it is easy to observe what happens in an organisation — for example leadership failures, poor marketing and so on — but it should be understood why such things happen.

International Maritime Organisation secretary-general Efthimios Mitropoulos said that 'safety is not an absolute concept and the levels chosen are based on shared values'. Scholars also concur that there is no obvious answer to the question 'what is safety?' because there are no absolute items that can give a clear definition. This is because individuals have a different perception of what is considered 'safe' or 'unsafe' and I want to understand how culture influences this concept.

My research relied heavily on ethnographic methodologies carried out as an insider work-based researcher. I spent four months collecting data as a participant observer onboard a DP drillship in the fieldwork phase of this work-based research, working in three different countries — South Korea, Malaysia and India.

I carried out 14 semi-structured interviews, five focus groups and 74 observations. In total I interviewed participants of 10 different nationalities. The observations enabled me to record measurable 'group' and 'grid' determinants, which cap-
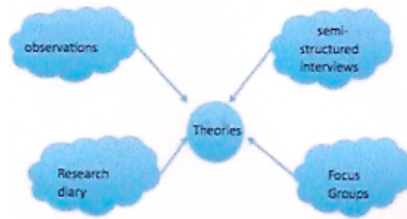
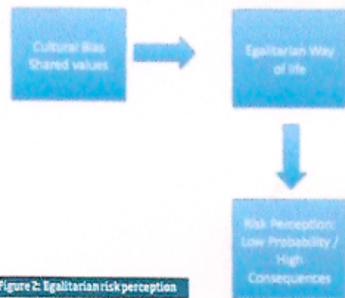Figure 1: Graphical representation of data collection techniques

Figure 2: Egalitarian risk perception

Captain Valerio de Rossi says he wants to help prevent offshore accidents such as the Deepwater Horizon explosion and sinking Picture: US Coast Guard

Cross-cultural Safety Consciousness Model

- Stage 4:
- Controls

- Stage 1:
- Observations

- Stage 3:
- Relate

- Stage 2:
- Analysis

Control in place based on RP

Cultural Bias and shared Values

Specific Risk Perception associate with WOL
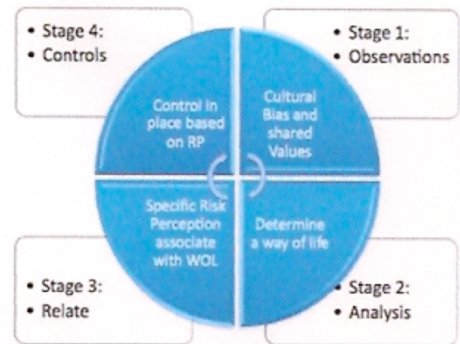
Determine a way of life

Figure 3: The cross-cultural safety consciousness model

tured the two dimensions of Douglas's cultural theory. 'Grid' refers to the degree to which individuals' choices are circumscribed by their position in society, while 'group' refers to the degree of solidarity among members of the society, a personal control exercised by members over each other. I then triangulated the data to increase the validity and reliability of the findings.

Figure 1. I analysed and interpreted the data with the aim of explaining the meaning of my findings through a systematic analysis of their content. I coded and broke down the transcripts of my interviews into manageable categories on a variety of levels, such as word, word sense, phrase, sentence and theme.

The key themes that emerged from this ethnographic investigation highlight the perception of 'high consequences/low probability' risk among the working community. In this context, the cultural relativity of the hazard perception is an instrument for the maintenance of group solidarity.

The research also showed that among the multicultural working community there is in general a lack of hazard identification and a 'zero risk' philosophy approach — as opposed to the pragmatic risk management method sought by companies.

The group that emerged in this work-based research is culturally biased according to a 'way of life' that characterises and predisposes it to adopt a particular view of society at work — with data analysis suggesting a specific way of life that corresponds with an 'egalitarian' style, as defined by Douglas.

Figure 2. In other words, the data I collected and analysed suggests that cultural bias and shared values have established a specific way of life among the working community, and this way of life has influenced how the safety is lived and — most impor-

tantly — is seen and perceived by the workforce community.

In light of these findings, I propose the concept of 'cross-cultural safety consciousness', which I define as 'an approach to safety which values the perception of risk based on cultural biases and shared values'.

I also propose a conceptual model, of which I claim copyright, for a practical approach to safety based on the findings of this research with the aim of reducing the number of incidents in the offshore oil industry.

I have, in this model, defined four distinctive stages. In the first, I highlighted the necessity to understand the cultural biases and the shared values of the community of practice under study. In the second stage, I crystallised the need to classify the working community based on the cultural theory framework (Douglas 1992).

The third stage is linked directly to the second; here the risk perception of the working community is predicted based on the cultural theory classification made in stage two. And in the fourth stage I found it necessary to put controls in place based on the risk perception predicted in stage three. These controls are used as a barrier for incidents.

Figure 3. Applying the proposed model to the research context shows that controls need to be put in place related to risks perceived as having low consequences but with high probability — which are the ones not apparent to the working community and where it is plausible to have incidents.

With the implementation of this model a significant reduction of work-related incidents is expected, with barriers in place where the risk is not perceived and therefore where the exposure to incidents is greater. Risks with low consequences but high probability can surely escalate to serious injuries or worse if not perceived correctly by the working community. The barriers nec-

essary to be put in place should prevent these incidents.

The implications for professional practice are therefore to move towards a different safety management system in the offshore oil business and in maritime safety in general — to apply the analyses and findings of cultural theory in a very complex and multicultural environment where the understanding of the human element interacting with policies and procedures is not straightforward but is rather ruled and governed by many different elements, as emerged from this work-based research.

A P P E N D I X   R

RAL claim at Level 5 for "Advanced developments in professional practice"
(100 credits)

Valerio De Rossi, student no. M00202051

AREA OF LEARNING: <u>MARINE OPERATIONS AND SAFETY MANAGEMENT</u>

<u>Evidences:</u>

Passage Plan 2006 Brazil to Egypt (Appendix A)
Passage Plan 2007 Egypt to Morocco (Appendix B)
Emails from management (Appendix C and D)
De Rossi, V. (2004) 'The quest for optimum safety', Seaways, 6, pp. 15-16/21 (Appendix E)
Incident Report (Appendix F)
Master Mariner Certificate of Competency (G)
Management of Major Emergency Certificate (H)
Search and Rescue Training Course Certificate (I)
PIC assessment's evaluation (L)

1. Introduction

I am claiming a Level 5 advanced developments in professional practice in Marine Operations and Safety Management. This assumption is based on the use of interdisciplinary professional knowledge with high level of autonomy and responsibility for complex and high level nature professional projects as detailed here below. This type of knowledge is clearly heterogeneous and not solely discipline-based such as the Mode 1(Gibbons *et al* 1994 p.19), which distinguishes what is fundamental and applied, with a theoretical insight translated into operational application. The knowledge I am putting forward in this claim is of different nature, as it is characterised by the shifting from fundamental principles, discipline-based primarily cognitive, towards contextualised results clearly trans-disciplinary, embracing science and technology, as well as social sciences and humanities.

The professional projects I am putting forward for this claim required for their planning and execution interdisciplinary skills and knowledge, such as Nautical Science, navigation, meteorology, ship's stability, marine engineering, regulatory compliances, safety and security management, ship's manoeuvers, human resources management, dynamic

positioning operations. I trust this was a quite high nature and complex challenge, the practical application of the trans-disciplinary knowledge that I would define as Mode 2 (Gibbons *et al* 1994) has enabled me to programme, prepare and also execute extensive ocean passages autonomously and with full responsibility of the crew, asset and environment, in a safe, efficient and commercially astute way. I will demonstrate that I have used my knowledge, skill and experience to make executive decisions that had financial and operational impacts; in addition I will also demonstrate that I was able to manage an emergency situation in an efficient and professional way, where I trust I used what Schön (1987) defines as "*artistry",* the competence a practitioner uses in indeterminate zone of practice, trying to fill the gap left by professional curriculum. The Ship is a state of the art Dynamic Positioned Drill Ship built in 1999, able to drill in a water depth up to 10,000 feet, with a length overall of 171 metres, a breadth of 28 metres and a load displacement of 26,537 MT with a crew of 130 persons. These professional projects were carried out without any supervision, submitted only for approval to my direct shore based Manager. I was leading, in the planning stage, the shipboard team composed by the Ship's Officers, directing supervising the Chief Mate, two Second Mates, two Third Mates, the Chief Engineer, the First and two Third Engineers. during the execution of the plan, I was in charge of the full crew of 130 persons.

Level 5 indicator(s):
C2: I have used effectively a wide ranging resources to plan the professional projects.
C4: I have autonomously operated within my professional practice with the highest level of responsibility and leadership to achieve the given goal.

2. Authority and responsibility.

To better understand my professional role I would like, first of all, explain the level of authority that I,as a ship's Master, have aboard my vessel, which is clearly specified by the International Maritime Organization (IMO) with resolutions and Codes. To be more specific, the IMO Resolution A.443 (XI) adopted on 15 November 1979 invited Governments to ensure that the shipmaster is not constrained by the shipowner, charterer or any other person from taking any decision which, in his or her professional judgment is necessary to operate in a manner consistent with safety of human life, equipment and protection of the marine environment. In addition, the shipmaster is protected from unjustifiable dismissal or other unjustifiable action by the shipowner, charterer or any other person, as a consequence of the proper exercise of his or her professional judgement.

This important resolution was also taken into the preamble of the International Safety

Management (ISM) Code, entered in force the 1st July 1988, amended by resolution MSC 99(73) accepted on 1st January 2002 and become effective the 1st July 2002, date on which the ISM Code became mandatory for a wider range of cargo ships and for mobile offshore drilling units (MODU).

The ISM Code Section 5.2 requires the Company to ensure that the Safety Management System (SMS) operating onboard the ship contains a clear statement emphasising the Master's Authority, and his or her overriding Authority and Responsibility to make decisions regarding safety and pollution prevention and to request the Company's assistance as may be required. This is particularly important in situations where quick decisive action has to be taken by the Master. The professional judgement of the Master is also recognised in Regulation 10.1 added to Chapter V of the International Convention for the Safety of Life at Sea (SOLAS), 'Master's Discretion for Safe Navigation', in November 1995. It states that "*The master shall not be constrained by the shipowner, charterer or any other person from taking any decision which, in the professional judgement of the master, is necessary for safe navigation, in particular in severe weather and in heavy seas*".

The Master therefore has the legal authority and responsibility with regards to his crew, owner's property and pollution prevention. To be able to cope with all the above, beside the professional experience gained in around twenty years at sea, I went though formal training and I hold an unlimited Master Mariner certificate of competency. (Appendix G)

In addition to all the above, the SOLAS regulation V/33 imposes on shipmasters a duty to respond to distress alerts. The paragraph 2 confers on shipmasters a right to requisition assistance from other ships, and imposes on masters of requisitioned ships a duty to comply with the requisition. I have attended a specific course to cope with this duty, this is the RADAR ,A.R.P.A., Bridge Team Work, Search and Rescue Training Course at management level in accordance to the International Maritime Organization (IMO) STCW/95 convention. (Appendix I)

Level 5 indicator(s):
C4: I have demonstrate that I am well aware of my legal and ultimate responsibility and authority while exercising my professional practice, and that I have used my leadership in an appropriate manner.

3. Description of Learning

3a. Planning stage (Appendix A, B)

The objective of the passage plans were to prepare the Drill Ship I was commanding to leave Brazil, where we finished a long term contract with the national Oil Company "Petrobras", to then start a new contract with Shell in Egypt to execute four exploration wells in deep water; then from here to the Atlantic coast of Morocco, in a safe and efficient manner. I had to plan in details the routes, where I have used my navigational and meteorological skills and knowledge; then I planned the bunker management, the stability requirements, the loading and offloading operations, the emergency response and security issues.

If we analyse the first passage plan in Appendix A, it can be noted that I have planned to start sailing with a Northerly route from Rio de Janeiro up to the city of Recife. I made that decision for several reasons; first of all bearing in mind that I had a crew of 130 persons, so should an emergency medical evacuation arose, a helicopter would have been able to fly from the Brazilian coast to the ship. In addition, I have also taken in consideration my ship's relatively slow speed and the action of the NE wind which was predicated in that time of the year. As I was sailing almost towards such wind, the choice to sail closer to the coast would, in my opinion, improved the ship's speed. The ship I am referring too is a drill ship with a peculiar shape, having a derrick in the middle of it and an opening on the hull that permits the pipes to go through it. This particular profile has quite a sail and drag effect and the meteorological condition have a drastic consequence on the ship's speed. I trust that here I have used my navigation and ship's stability knowledge in a synergic endeavor with my safety management skills.

In addition, I had divided the voyage in two legs, the first one across the ocean from Rio de Janeiro to Las Palmas, Canary Island, and the second one from there to the well location. This decision was taken again for several reasons; mainly loading of our client materials was necessary, but in addition we also took the opportunity for bunkering, load food, fresh water and performing a crew change. The choice of stopping in Las Palmas was my suggestion, then approved from my management and client representative. I was asked for the best port where we could stop to load our client's materials, before starting the drilling operations offshore Egypt. I then proposed Las Palmas. This choice was made for the following reasons; it is about a day sailing time to Mediterranean Sea and it is in a strategic position almost at the end of the ocean passage. It has good port facilities, shore

cranes able to lift heavy equipment, and sufficient water depth in the inner port.

This is a very important issue, the main draft of the ship is about 12 metres, which is quite a lot and it is not always feasible to enter a port if it does not have enough draught. As stated in the passage plan, there was the possibility to choose between Gran Canaria and Tenerife Islands, but Puerto de la Luz situated in Bahia de Las Palmas offered better repair than Santa Cruz de Tenerife harbor, which is more open to the Easter sector. In fact, the Admiralty Sailing direction (Africa Port Vol. 1) reports that in Tenerife the anchorages are open to winds between ENE and SSW, and swell generally sets in owing to the prevalence of Easterly winds. In winter time there are often SE gales, therefore in light of these elements, I have proposed to stop in the port of Las Palmas, Puerto de la Luz, where we could benefit of the shelter of the NW side of the Isla de Gran Canaria.

In the Passage Plan in Appendix B, leaving Egypt to Morocco, I have planned to use the Traffic Separation Scheme (TSS) North of Malta and North of Isle de la Galite, this decision was made with the aim to to minimize the counter effect of Easterly going ocean current coming from the Gibraltar Strait. After passing Gibraltar Strait, I planned a WSW course to the final well coordinates. I was expecting a Northerly wind of force 4 to 5 with a 20-25% probability in that period of the year. Unfortunately the weather encountered during the passage was force gale, which corresponds at force 8 as detailed in the next section, and this has lead to a management of change where I took a decision that had a financial impact on the project.

Level 5 indicator(s):
B3: I have autonomously managed my own learning using professionally my team in support of my decisions.
C1: I have definitely used interdisciplinary approaches and understanding in these projects, in a very specialised work context.

3b. Financial aspect, execution and decision making impact

The Ship was contracted on a day rate of USD 240,000 (1) for the drilling campaign in the Mediterranean Sea, the passage plan from Brazil was about 36 days, for a total revenue of USD 8,640,000. This revenue figure is without taking in consideration the days of stop over in Las Palmas, for an additional USD 1,200,000 ; the total income of the ocean passage from Brazil to Egypt was about USD 10 million for my company. This cost does not take in consideration consumables, such as fuel oil and lubricants for the voyage, again provided by our client. If we take in consideration an average maritime fuel oil price

of about 450 USD/MT, and a fuel consumption of about 50 TPD (Ton per day) we have a total consumption of about 1,980 MT, with an expense of USD 891,000. In light of this financial aspect the choice of an appropriate route and the stop over was quite important and had an impact on my organization.

The next contract was for a day rate of USD 320,000 (1) and I had to plan the voyage from offshore Egypt to the Atlantic coast of Morocco. The voyage was planned for 12 days (see Appendix B) for a total revenue of USD 3,840,000. This passage was executed in winter time and I requested a weather forecast through out the route. When I approached the Gibraltar Strait the weather was forecasted to force gale, with wave heights of 13 metres in the Atlantic Ocean. I then decided to stop the ship and wait inside the Mediterranean Sea for a weather improvement. This decision was made based on my interdisciplinary knowledge, skill and experience; it had a financial impact as the ship was waiting on weather for about two days, with a cost of about USD 640,000 for our Client.

 This decision, as earlier mentioned, was based on my interdisciplinary knowledge, and it was mainly dictated by safety reasons and operational considerations. Going out in the Atlantic ocean with that kind of weather would have meant to jeopardize the safety of the ship and crew under my responsibility. Secondly, I considered that I was about 24 hours from my final destination, the well location in Morocco, so even if I managed to sail through the Gale force, I would have been unable to start the exploration well as the weather would have been above the ship's operational criteria. I therefore decided to monitor constantly the weather forecast in order to pick up the right moment to leave our sheltered water. I was constantly in touch with my shore based Manager and client, who understood my reasons and respected my decision. One of my actions was to ask for a second weather forecast from a different source,(i.e. a different forecast provider) I then called personally the forecasters in order to discuss the weather situation, requesting a detailed route forecast. At the end, my decision was found to be the most appropriated, we arrived in location with a perfect timing to start our operation, and this was acknowledged by my Management.(See Appendix C and D)

Level 5 indicator(s):

A1: I trust that the above description evidenced my knowledge in a complex professional area underpinned by sound theoretical understanding.
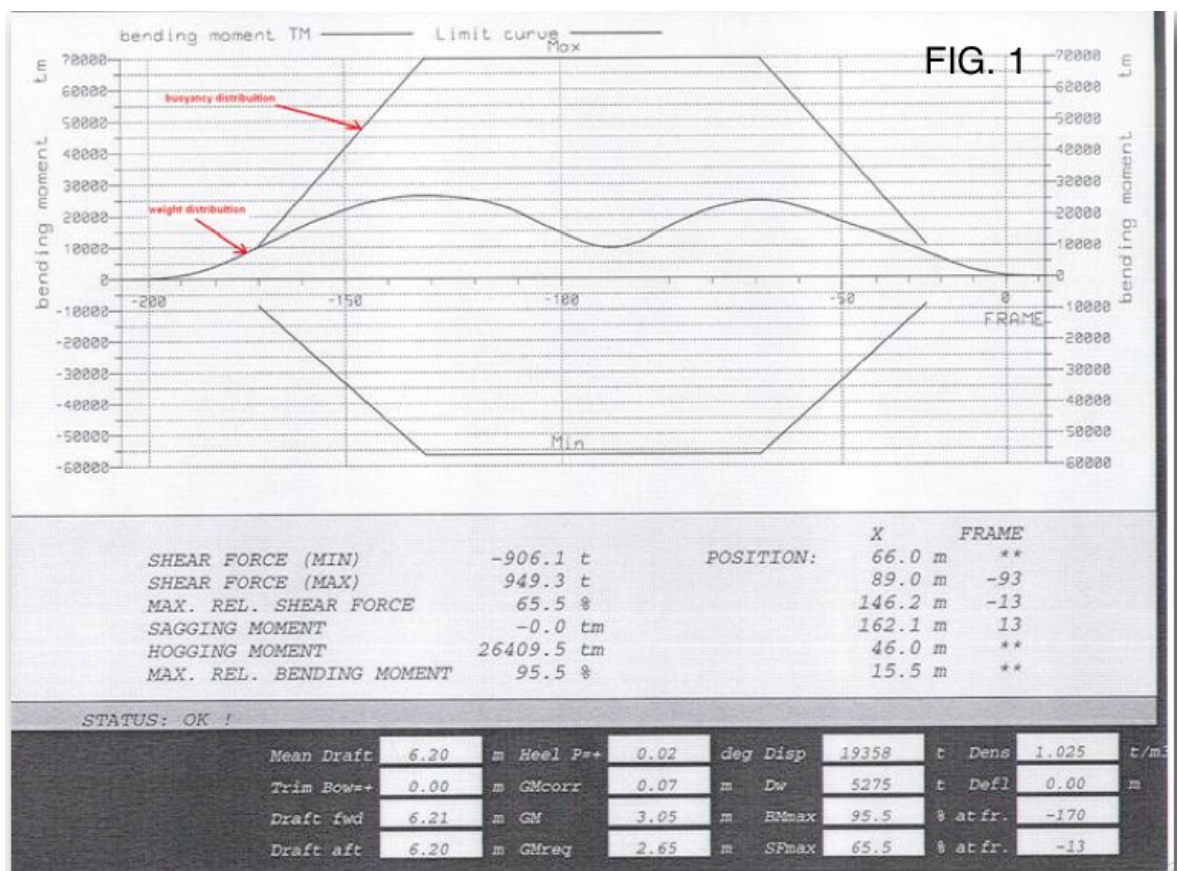
A3: I have dialogued with peers, client and superiors, well aware of a possible dilemma and conflicting values which could arise in the aforementioned situation. I founded a solution that have pleased all parties and most important it was found to be the best choice in that particular context.

B3: I have planned and managed the situation, drawing from my own learning and

experience, to then using professionally others in support of my decisions.

3c. Stability Knowledge and management.

I am quite conversant with ship's stability, and during the voyage the stability calculations were carried on a daily basis, ensuring that the vessel remained within the stability margin and to minimize the Bending Moment and the Shear Force. The term stability refers to the tendency of a body or ship to return to its original state after it has suffered a small disturbance. As Master I am responsible to ensure that my ship floating upright, will return in this position after it has been hit for example by wind or wave. If a ship is very stable it will return quickly to the upright position and may produce motion sickness; but if it is just stable, any interference which is not small may cause it to capsize. The stability therefore must be carefully calculated in order to have it in the range of conditions which allow the ship to return to the upright position during its operations. If the ship, subject to a small disturbance from a position of equilibrium, tends to return to that state it is said to possess *positive* stability. If, following the disturbance, the body remains in its new position, then it is said to be in a state of neutral equilibrium or to possess *neutral* stability. If, following the disturbance, the excursion from the equilibrium position tends to increase, then the body is said to be in a state of unstable equilibrium or to possess *negative* stability.

FIG. 1

	X	FRAME
SHEAR FORCE (MIN)	-906.1 t	POSITION: 66.0 m **
SHEAR FORCE (MAX)	949.3 t	89.0 m -93
MAX. REL. SHEAR FORCE	65.5 %	146.2 m -13
SAGGING MOMENT	-0.0 tm	162.1 m 13
HOGGING MOMENT	26409.5 tm	46.0 m **
MAX. REL. BENDING MOMENT	95.5 %	15.5 m **

STATUS: OK !

Mean Draft	6.20	m	Heel P=+	0.02	deg	Disp	19358	t	Dens	1.025	t/m³
Trim Bow=+	0.00	m	GMcorr	0.07	m	Dw	5275	t	Defl	0.00	m
Draft fwd	6.21	m	GM	3.05	m	BMmax	95.5	% at fr.	-170
Draft aft	6.20	m	GMreq	2.65	m	SFmax	65.5	% at fr.	-13

185

The GM value expresses the stability of the ship; this value is the distance between the center of gravity G and the metacentric height M. The latter is the point of intersection of the buoyancy force's line of action with the z-axis, the metacentric height is said to be positive when M lies above G. Should M lie below G the body is unstable, If M and G coincide the equilibrium is neutral.
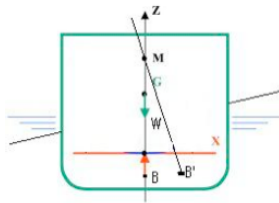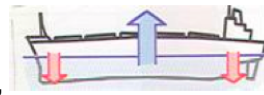

Fig. 2

W= Weight B=Buoyancy M= Metacentric height   G= Center of gravity

In the projects in Appendix A and B I have stated that the ship will have a GM of 2,10 metres, the aforementioned explanation highlight the importance of this value which expresses the stability of the ship. In addition, for the safety reasons I have to consider the stress on the hull caused by the the bending moment in a given stability condition. Figure 1 represents graphically the bending moment **TM** calculated from the distribution of the weights on the ship, and the limit curve which is the buoyancy distribution of the hull.
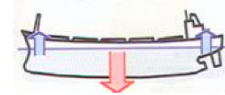
In the instance in Fig. 1 we have 0 tm of sagging moment , but we do have a quite high hogging moment, caused by excessive amidships buoyancy of 26.409 tm.

 This is caused largely by the "moon pool", which is the opening in the centre of the vessel that permits to lower tools and drill pipes into the sea. The total weight of a vessel must be supported by an equal and opposite upwards force of buoyancy, in a vertical line wit the centre of gravity. In my case, the distribution of the separate weight along the length of the hull, does not match exactly the buoyancy distribution because of the said moon pool.

I have to carefully calculate the ballast water needed aft and forward to remain even keel, and although I have ballast tanks next to the moon pool where I can add water and therefore weight, often I have still an excessive amidships buoyancy causing the hull to hog. In this context I have to use my inter-disciplinary knowledge which embrace the safety management to deal with this specific problem. In fact the Safety of the ship and its crew play a role here as I have identified an Hazard, which is a situation with the potential to lead to harm. In this particular instance the Hazard is the excessive stress to the hull

which has the potential to jeopardize the ship's watertight integrity with the consequence of water ingress which could undermine the ship's stability. Once I have identified the Hazard, I need to assess the Risk, which is the probability of the harm being realised. Although there are complex Risk Assessment tools, a basic process includes answering three questions;

1 What can go wrong?

2 How likely is it?

3 What are the impacts?

Answering qualitatively to these questions is often sufficient for making good decisions about the allocation of resources. Here I have to utilize my knowledge and experience to ensure the Risk is as low as reasonable practicable, as per Company policy, with preventive and mitigating controls. The former impede an incident by reducing its likelihood to occur, while the latter reduce the consequences of an incident should the preventive controls fail.

The preventive controls I have putted in place is the daily check of the ship's stability in order to establish firstly that the ship possess positive stability, and secondly that the Bending Moment does not exceed the limit curve. A mitigating control is to check constantly the tanks' level to capture any water ingress due to compromised watertight integrity, so to reduce the consequences of an incident.

Level 5 indicator(s):

C1: I am aware of the complex and specialised professional practice I operate in; I have used interdisciplinary approaches and understanding underpinned by theoretical knowledge, into workable frameworks. In specific, I have managed the ship's stability and the Risk assessment into a feasible model of practice.

B1: I was able to analyse and synthesise complex information in order to contextualize the knowledge and then develop the best approach for a successful project.

B4: I was able to evaluate professionally the given situation and then assess the correct approach.

4. Safety Management and risk assessment

I am well aware that Risk Assessment is a key issue in any offshore operations, (De Rossi, 2004, Appendix E) as well as an effective Safety Management System. This is an important aspect of my working practice, safety is directly linked with the operations, and there is no a winning enterprise without a perfect safety record. I have taken in the right consideration the safety management in both projects; as a matter of fact, one of the

actions I have planned was to carry out a complete fire and abandonment drill, 24 hours prior to sail, involving the total crew of 130 persons under my direct responsibility. This was done to verify our emergency procedures and to ensure that everybody was aware of his duty during a crisis. (Please see Appendix A and B)

In addition, when the vessel was outside of immediate medical assistance, I reviewed the planned daily activities to determine if any of these needed to be postponed due to limited emergency response resources. To avoid any navigation dangers, a full watch was maintained on the bridge at all times. I appointed the Chief Mate and Second Mates responsible for ensuring that all navigation aids were in good order at all time. I also delegated them the responsibility to inform the Electronic Technicians if there was any defective apparatus. These checks were carried out at the beginning of each watch and logged appropriately according to good seamanship, company's polices and safe behavior. I am glad that I have taken the necessary step to prevent, manage and control a possible emergency, because we did have a fire on board during the stay in the Canary Islands.

Brief Description of events and emergency management
The 21 December 2006 the ship was tied up along side a quay in the port of Las Palmas, Spain, where a fire was discovered in the warehouse at 5,15 am. I immediately proceeded to the bridge where I took control of the emergency. I had two fire teams on the scene coordinated by the Chief Mate, and two men with fire suit and breathing apparatus had entered the warehouse. In the mean time I communicated our emergency status to the port authority and our shore based manager and started to get all the crew accounted for at the Muster point. I instructed the Chief Mate to send a search party to check the adjacent compartments and the thrusters room underneath the store to ensure there were no hot spots nor casualties.
When the Chief Mate reported that the Fire was out, I instructed him to keep a fire watch, I was satisfied only when I had all personnel accounted for.

Learning and reflection on this emergency:
My main concern was to use the fire teams to fight the fire as soon as possible, to save lives and property. My other concern was to achieve quickly a full head count, to ensure I had no casualties in the warehouse. This for good reasons, as one method to extinguish the fire in a closed compartment is to use inert gas to flood the area in order to remove the oxygen. Releasing inert gas without the entire crew accounted for, could mean to have potentiality a casualty in the area and therefore put his or her life in danger. Once I had

the full crew accounted for and no casualties reported, I was really relieved; in addition the fire was putted out with portable fire extinguishers. The total asset loss due the fire was around 25,000 USD but the potential could have been enormous, such as the entire warehouse stock, for a value of over 4 millions USD, not to talk about the loss of the entire ship plus the loss of the revenue, should the ship has gone for major repair (Please see Appendix F).

I trust that effective emergency management requires specific skills. As the Person In Charge, I was concentrated to develop an overall strategy, delegate responsibilities, provide instructions and support, initiate the correct level of emergency response, and meet the overall team requirement and expectations. I trust that these are special skills that go in an uncharted territory beyond professional knowledge and practice competence, described by Schön (1987 p.13) as "artistry" or the *'competence by which practitioners actually handle indeterminate zones of practice',* in short something that elude conventional strategy of explanation and unexamined epistemology of practice. I have done formal Emergency Management Courses (See Appendix H, and L) where I was taught how to react at the different emergencies we ought have on board our vessels. My argument is that not all the emergencies are on the book; this was a classical example, we do have emergency procedures for fire on board, but in this situation we were in a port with extra day trippers involved in our operation, which makes a unique situation altogether. I trust that I have then filled the gap using my "*professional artistry*" , managing the 'out of the book' situation relying on my competence, knowledge and skills as a practicing Master Mariner.

This is the type of incident I aim to avoid, I believe that rather than working on the mitigating controls, we need to work on the preventive measures. What I would like to investigate with my Research is the human behaviours of the offshore community, with strong emphasis on the fieldwork that I will carry out as a participant observer. I believe that it is important to understand why incidents occur and try to explain the accident involvement, the safety performance in terms of attitude and climate into an organizational culture. The project would be valuable because it is my company's Safety Vision to avoid incident in the workplace. The Safety Management Systems are quite comprehensive, in my Case Study (De Rossi, 2004) I demonstrated that big hazards are identified and controls are in place to reduce the risks according to the company's expectation, but it is from the so-called routine job that we are experiencing incidents.

Level 5 indicator(s):

B2: I trust that this is a solid evidence that I am able, in my professional contest, to self appraise my practice and to reflect in action.

A1: I have demonstrated that I have a deep knowledge of this specific and complex aspect of my practice.

5. Influence On My Organization

With the projects in Appendix A and B I am confident that I have made an impact on my operations using a holistic approach to the management of the passage plans. When I assumed my present command, I founded that the previous passage plans where merely a route planning to move the ship from the point A to B, without taking in consideration the important issues addressed in my projects, such as safety and security management, bunker requirement, meteorological and stability issue, safe havens, medical protocol, salvage and damage control. The "passage plans" in Appendix A and B were approved by management and they had all the relevant information needed to execute the ship's re-location, including a graphical map showing the ship's route for those users not familiar with the nautical terminology. I trust that the projects have improved a possible communications' problem between technical, operation, quality, health and safety, client and marketing departments, as they address the re-location of the Drill ship from one operation's site to the next in a clear, professional and exhaustive manner. In addition I have set a standard for future planning which has to be met by peers, because my projects will be definitely used by management as reference for quality assurance.

Level 5 indicator(s):
B4: I was able to evaluate independently the projects and to then assess the best approaches for the different aspects of the profession, which formed the bases for improvement in practice.
C2: I have effectively used resources in a wide range, which has impacted the work of peers, subordinated and clients.
C3: I have clearly communicated in writing the professional projects to peers, superiors and clients.

6. Conclusion

I trust the Area of Learning here represented reflect my professional practice as a Master Mariner operating in the Drilling industry, where the Marine Operations are directly linked with Safety. My practice is very dynamic, and I systematically use my professional knowledge in order to achieve a clear objective, which is a safe and efficient operation which will generate a profit for my company. in terms of performance, the safety

management in place in the offshore oil industry in general and in my company in particular is becoming more concentrated on the behaviour of personnel involved in the operations in order to effectively plan, control and eventually improve the overall production. I firmly believe that the only way to achieve a winning operation is to eliminate or mitigate the risk, and this can be done only through hazard identification (De Rossi, 2004 Appendix E). In fact, it is evident that if you do not identify the hazard, the risk could not be eliminated, prevented or mitigated. In my field of practice I am well aware of the presence of risks, but must be bore in mind that analyzing and assessing a risk does not lead to a hazard-free environment. All it does is tell you what the risks are. It is then necessary to decide what to do, and whatever is done will leave some residual risk, reduced as per company policy to as low as reasonable possible. (ALARP) In the projects in Appendix A and B I have planned the safety of the vessel with a proactive approach, although when an emergency arose I had to respond *reactively.* In fact, I believe that being a Master of an Offshore Unit demands a level of command ability which is not a normal feature of management posts. As I stated in the incident description, specials skills needs to be used. I have to obtain and evaluate information quickly in an emergency, but I also have to make valid interpretations in order to make sound decisions. In addition, I have to review potential outcomes and identify possible contingencies. This reactive approach should be anyway the *"ultima ratio"* and not the norm; it is important to possess the skills, knowledge and experience to react in emergency, but the point is that the incident should be avoided in a first place. The Company Management supports the preventions of incidents, injuries and occupational illness and also seeks to reduce the risk of damage to the environment and property. I trust that this can be achieved with proactivity and individual commitment, and I believe that my proposed work based research, which is focused on the human behaviour, will help the company in achieving the Safety Vision of an incident free workplace, and in addition it will produce a unique opportunity for an insider research to explore the Human Factor in the offshore activities.

Level 5 indicator(s):

A2: I trust that I have demonstrated a critical selection of professional Research and Development skills in carrying out this professional projects.

Summary of Level 5 learning claims.
Passage Plan 2006 Brazil to Egypt (Appendix A)
Passage Plan 2007 Egypt to Morocco (Appendix B)
De Rossi, V. (2004) 'The quest for optimum safety', Seaways, 6, pp. 15-16/21 (Appendix E)

De Rossi, V. (2004) 'An Incident-free working environment: an achievable goal or an improbable dream? The human factor'. The International Maritime Human Element Bulletin [Online] Feb. 2004, Available from: http://www.he-alert.org/documents/published/he00235.pdf [Accessed 10th March 2007] (Appendix M)

Notes:

(1)See day rate for the "*Deepwater Expedition*", http://www.deepwater.com/_filelib/FileCabinet/fleetupdate/RIGFLT-FEB5-2008-web.pdf?FileName=RIGFLT-FEB5-2008-web.pdf [Feb 08]

References:

De Rossi, V. (2004) 'The quest for optimum safety', Seaways, 6, pp. 15-16/21

Gibbons M, Limoges C, Nowotny H, Shwartsman S, Scott P, Trow M, (1994) The New Production of Knowledge : the Dynamics of Science and Research in Contemporary Societies. London: Sage Publications

Schön, D. (1983) The reflective practitioner. New York: Basic Books