

DEVELOPING MARINE POLLUTION AWARENESS AMONG NEW RECRUITS

AT SAS SALDANHA NAVAL GYMNASIUM: A TRAINING NEEDS ANALYSIS

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ABSTRACT

This dissertation focuses on the marine pollution awareness training needs of newly recruited SAN employees. It uses Training Needs Analysis (TNA) as a tool to gain a better understanding of what knowledge, skills and attitude (KSA) recruits should have about the marine environment and if their level of competency meets the requirement to effectively and efficiently contribute to the sustainable use of the maritime environment in which they will be deployed. Ultimately, their individual and collective abilities will be a determining factor in the strategic intent of the SAN to be unchallenged at sea.

The absence therefore of a Marine Pollution Awareness Training Programme (MPTAP) within the Basic Military Training (BMT) curriculum of new recruits at SAS SALDANHA Naval Gymnasium necessitated a TNA. Based on prior research on training conducted by subject matter experts both internal and external to the SAN it was decided to conduct a TNA on the KSA's required in terms of marine pollution awareness amongst newly recruited members.

The literature provided discusses education, training, development of employees and focuses then on the role and importance of TNA's. Information was gathered from various subject matter experts, archival records, policy documents, internet-based resources and newly recruited naval learners consisting of a sample of 25 new recruits. Theory was used to determine the KSA expected from naval employees in terms of marine pollution awareness. Data obtained from each of the research resources was coded and grouped in order to establish themes. This allowed the researcher to determine what KSA's recruits should have about the marine environment and if their level of competency meets the requirement to effectively and efficiently contribute to the sustainable use of the maritime environment in which they will be deployed.

The researcher therefore found that first priority in terms of KSA's should be given to a basic legal understanding of the regulatory framework that is applicable on marine pollution. This understanding will form the foundation for recruits to have the ability to

know “what to do when” during observed transgressions. The legal understanding in combination with the Sector Education Training Authority (SETA) unit standards will help new recruits to be skilful when applying safe working practices thereby ensuring their own and others' safety. Ultimately, a basic but well entrenched knowledge about marine pollution together with applied skills on how to use the knowledge should influence the attitude of new recruits in a positive manner. The researcher concluded that there is a need on the macro, meso and micro level for a MPATP amongst new recruits at SAS SALDANHA. It is recommended that since this research appears to establish the first empirical confirmation of the training need amongst new recruits, it will require further research in terms of curriculum design, curriculum implementation and the evaluation thereof. It would therefore be in the best interest of the SAN to ensure the integration of a MPATP into the planning phase of future BMT Curriculum"s. It would also be advisable to communicate this intent with all the relevant stakeholders in order to ensure alignment with governmental organisations as well as the private sector where these new recruits can be employed based on their newly acquired competencies.

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DECLARATION

I Werner Kwak, hereby declare that this research dissertation is my own original work, that all reference sources have been accurately reported and acknowledged, and that this document has not previously, in its entirety or in part, been submitted to any University in order to obtain an academic qualification.

Werner Kwak

Date

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ABBREVIATIONS

ASGISA	Accelerated Shared Growth Initiative of South Africa	12
BMT	Basic Military Training	2
DEAT	Department Environmental Affairs and Tourism	17
DOD	Department of Defence	12
EE&T	Environmental Education & Training	26
ETQA	Education Training Quality Assurer	27
GPA	Global Program of Action	14
IMO	International Maritime Organisation	15
KSA	Knowledge, Skills and Attitude	1
NPA	National Program of Action	14
SAMTRA	South African Maritime Training Academy	37
SAN	South African Navy	8
SAQA	South African Qualifications Authority	27
SASSETA	South African Safety & Security Education Training Authority	27
SETA	Sector Education Training Authority	8
MPTAP	Marine Pollution Training Awareness Program	8
MEPC	Marine Environment Protection Committee	23
MSDS	Military Skills Development System	12
TETA	Transport Education Training Authority	27
TNA	Training Needs Analysis	2
UNEP	United Nations Environmental Program	24

INTEGRATIVE SUMMARY

The SAN realises the importance and accepts its responsibility as custodian of the marine environment in which it trains and operates. The environmental policy of the SAN expresses the corporate responsibility by means of a commitment to creating a better environment through the prevention and combating of all forms of pollution and by complying with legislation and conforming to the relevant international conventions.

The researcher, who was previously appointed as the Environmental Manager in the SAN, has chosen this field of research due to the continued absence of marine pollution awareness training within the BMT curriculum of new recruits. The inherent naval risks that lead to the different types of marine pollution, affect the SAN in its achievement of core operational objectives as well as the marine environment that the SAN operate within. It is therefore inevitable that marine pollution awareness training will become increasingly more a key performance area that needs to be focussed upon when addressing the strategic intent of the SAN. A TNA within the SAN was used to indicate whether there is indeed a requirement for a MPATP amongst new recruits. The researcher focussed on the regulatory pre-requisites, SAN policies/archival documents and the SETA Unit Standards in order to determine what the required KSA"s of the new recruits should be on completion of such a programme.

The researcher concluded that based on the TNA conducted on macro, meso and micro level within the SAN there is indeed a requirement for marine pollution awareness training among naval recruits at SAS SALDANHA. The KSA that was found wanting amongst new recruits, could indeed be resolved with the presentation of a MPATP during their BMT programme. The MPTAP should however have an introductory legal framework, but should then be more focussed on improving the basic skills and attitude of new recruits in terms of combating marine pollution. This should result in them portraying a more sustainable disposition towards accepting responsibility for their daily operations and naval activities. This dissertation will therefore first present an Evaluation Report that includes a summary of the relevant literature on TNA, a description of the applied research method that was decided

upon and then an analysis of the results followed by a discussion and recommendations. The second section presents a more in-depth review of the relevant literature that is applicable on the research topic. The last section is descriptive of the research methodology that the researcher decided upon and reflects on the empirical considerations during the research.

Section 1: Evaluation Report

This Evaluation Report introduces the research problem, including the research area and presents a summary of the results of the research.

1.1. INTRODUCTION

The SAN as a leading naval force on the African Continent and in its appointment as custodian of the South African maritime sovereignty is acutely aware of the importance to protect and preserve the marine environment in which it serves the citizens of South Africa (South African Navy, 2010a). The aim of this research is to assess the training needs in terms of marine pollution awareness training of new recruits prior to their further education, training and development at SAS SALDANHA Naval Gymnasium. It is the expectation of the researcher that the results from the TNA should form a baseline for further research and assist in the design of a MPATP to be delivered as part of the naval recruits" BMT programme.

The research undertaken will be contextualised and the reasons given as to why the SAN views this research as an imperative within the ambit of sustainable force preparation and deployment. The research will assess the current competencies of new recruits in terms of what marine pollution entails and what they should know as prescribed by the different regulatory frameworks and standards. The research will also assess what the current BMT practises for new recruits involve and if marine protection and conservation KSA is integrated within the education, training and development process of new recruits.

The SAN identified a future benchmark for itself, through its vision of being "unchallenged at sea" (SA Navy, 2010a). This inevitably sets the backdrop whereby the SAN naval command and all its naval educators have to determine specific success criteria at the very beginning of BMT in order to achieve this benchmark, as well as to ensure maximum maritime competency amongst its learners, including new recruits (SA Navy, 2010a). The SAN is therefore committed to ensure "focused training and development of its members in its pursuit of World Class Performance standards" (SA Navy, 2010b). The SAN furthermore understands the necessity for capacitating its human resources through a "well co-ordinated continuous learning process that allows for professional and personal development, rooted in military education and leadership" (SA Navy, 2010b). The SAN is thus aware that the continuous learning should not only focus on its own needs, it should also prepare

the recruits to exit the organisation with skills and qualifications that will allow for a sustainable contribution outside the SAN.

The new recruits reporting at SAS SALDANHA for BMT, form part of the Military Skills Development System (MSDS) that is the outcome of a TNA conducted within the Department of Defence (DOD). The MSDS is an initiative in support of ASGISA - the Accelerated Shared Growth Initiative of South Africa (Department of Defence, 2003). While Coetzee *et al.* (2009: 78) noted the drive of many organisations to “right-skill” the workforce through their education, training and development efforts; given the Navy’s contribution to ASGISA, a “continuous learning process should not only focus on the needs of the SAN, it should also prepare the individual to exit the organisation with skills and qualifications that would allow for employment outside the SA Navy” (SA Navy, 2010b). Since the SAN is aware of the impact of training on its strategic objectives, it is required to identify the required KSA and train new recruits so as to display the expected behaviour (Amos *et al.*, 2008: 324-325).

For more than thirty years (Goosen, 1973), there was no requirement for the SAN to have a TNA conducted on marine pollution awareness training. However, over the last decade various factors such as legal compliance and financial pressures started influencing the changes in naval policy in terms of investing in human capital through programmes such as a possible MPATP. These factors required top level command structures (Sayed, 2010) to consider and possibly integrate marine pollution awareness, the regulatory framework governing marine resources protection, waste management legislation as well as corporate social and environmental responsibility into all career management planning processes (Kidd, 2008: 154; South African Navy, 2006).

The intent of a MPATP is therefore to improve the recruits’ level of KSA and behaviour by means of training and simultaneously ensure alignment with the strategic intent of the organisation. The MPATP is aligned with the statement made by Wagiet (2002: 27) that it “should improve their understanding and willingness to take responsibility for the impact that they have on the environment, both individually and collectively” and in the case of the SAN, includes the marine environment.

The terms of reference for this research is limited to only the TNA process of current competency levels regarding KSA and does not involve the complete process of designing a curriculum and assessing the success thereof afterwards.

The researcher realised from the onset that research on the subject of TNA and naval marine pollution training awareness will necessitate a focused approach. The focus of the literature review was on the regulatory framework of marine pollution within the South African context as well as TNA. Initial research began with training, education and development and how the three elements are inter-dependant. Theories on training and more specifically the TNA process was researched and used with the aim of applying it within the SAN context. The researcher however delimited the study to only the training needs of new recruits and envisages that research on curriculum design and development for a MPATP will be conducted at a later stage.

1.2. LITERATURE REVIEW

Training results from identified needs, defined as discrepancies between the way things are and the way things ought to be (Erasmus *et al.*, 2007: 125). These discrepancies according to Coetzee *et al.* (2009: 105) can be resolved through a proper analysis of training needs that include a systematic process of planning the needs analysis, developing the data-gathering procedures and implementing the procedures, followed by analysing and planning the identified training interventions. According to both Nel *et al.* (2009: 459) and Swanepoel *et al.* (2008: 450) the main aim of conducting a TNA is to identify performance requirements within an organisation, in order to channel resources into areas where the rendering of improved productivity or better quality services can take place. The seminal contribution of McGehee and Thayer (1961, cited in O'Driscoll and Taylor, 1992: 594) to the literature on TNA states that the analysis of training needs is normally conducted on an organisational, operational and individual level (Swanepoel *et al.* 2008: 451). Van Dyk *et al.* (1992: 168) as well as Erasmus *et al.* (2007: 125) refer to these as "macro-, meso- and micro-level needs". Cascio and Aguinis (2005, as cited

in Swanepoel *et al.*, 2008: 449) combined the three levels into two, to propose an organisational and a task/job level.

The TNA envisaged for this research will incorporate elements of all three levels. It must however be noted that due to the fact that the main emphasis of the research is on assessing the training needs in terms of KSA"s, the actual performance versus required performance within the micro level will not be assessed. Therefore, a complete TNA of the suggested MPTAP will not be possible due to the scope of the project (Holton *et al.*, 2000: 252).

In summary, the researcher intends to conduct an organisational analysis with the aim of examining the organisational objectives together with the available resources, thereby deciding what KSA"s are of importance and to prioritise it through the TNA. Thereafter the researcher will continue to focus on the meso or task level. The emphasis will be on determining whether an individual-level task is of importance to an organisation and whether training is to be executed. The next step is to establish the content of a learning programme, as well as the pre-determined levels of KSA.

1.2.1. The Environmental and Regulatory Context

The Constitution of the Republic of South Africa is very specific in providing a national imperative when it states in its preamble " Improve the quality of life of all citizens and free the potential of each person" (Constitution of the Republic of South Africa, 1996). The Constitution of South Africa also states in Section 24 (b) that "all South Africans have a Constitutional right to an environment that is not harmful to their health or well-being, and to have the environment protected, for the benefit of present and future generations". The above-mentioned legal quotations form the basis for the protection of the natural environment through the education and training of all citizens in South Africa.

According to Glazewski (2009:9), the generally accepted rule amongst environmental law practitioners is that the definition of "the environment" is an extremely wide concept. Together with the definition of the environment, the

accompanying concerns in terms of environmental degradation or pollution also encompass an even bigger and more varied field (Government Gazette, 2000). It is therefore important that all naval employees have a clear understanding of the parameters accepted by the Department of Defence regarding international and national environmental law and the respective definitions (Glazewski, 2010). The White Paper for Sustainable Coastal Development supports the intent of a MPATP because government realised the need for continued capacity building in order to provide a platform for nation building that should ultimately help transform our economy and society. It deliberately seeks to improve the quality of life of current and future generations of South Africans (Department of Environmental Affairs and Tourism, 2000).

In South Africa, the legal structure that governs marine pollution starts at national level. The legislation is quite extensive, but largely sectoral (i.e. different requirements are governed by different acts and by different government departments). There are also instances where specific requirements are governed by more than one Act. As a result, cooperative governance is a key consideration for successful management of land-based pressures on South Africa's coastal marine environment (Taljaard, 2008).

South Africa is a signatory to the Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-based Activities. This programme promotes and allows governments to express their commitment to prevent the degradation of marine and coastal environments from land-based impacts and threats (Taljaard, 2008). One of these commitments calls on governments to develop and implement National Programmes of Action (NPA). It is with the GPA and the NPA as background that the SAN has realised that its environmental policy framework will only be effective in its intent if more proactive systems and programmes regarding waste management and more specifically marine pollution control are implemented (Department of Defence, 2003).

According to Taljaard (2008), there are potentially five broad categories that exist concerning the types of marine pollution, namely:

- Pollution originating from land-based sources, including sewage effluent discharges, industrial effluent discharges, storm water run-off and contaminated groundwater seepage.
- Pollution entering the marine environment through the atmosphere, e.g. originating from vehicle exhaust fumes and industries.
- Dumping at sea, (e.g. dredge spoil and waste associated with naval activities at sea).
- Maritime transportation (which includes accidental oil spills and dumping of ship garbage, etc.).
- Offshore exploration and production (e.g. oil exploration platforms) (Taljaard, 2008)

It is however important to note that differentiation need to be made between systems that focuses on the prevention of marine litter at source and systems that deal with marine litter once it is found in marine or coastal areas (United Nations Environmental Programme, 2010b). Preventive measures include, *inter alia*, better waste management on land and at sea, and education and awareness-raising activities to influence behaviours.

Of the different sources of marine pollution, land-based sources (see Figure 1) are considered the largest with a 44% impact - based on studies by the International Maritime Organisation (IMO, 1977). It is important to note in the context of this research that maritime transportation contributes 12% to the total amount of marine pollution.

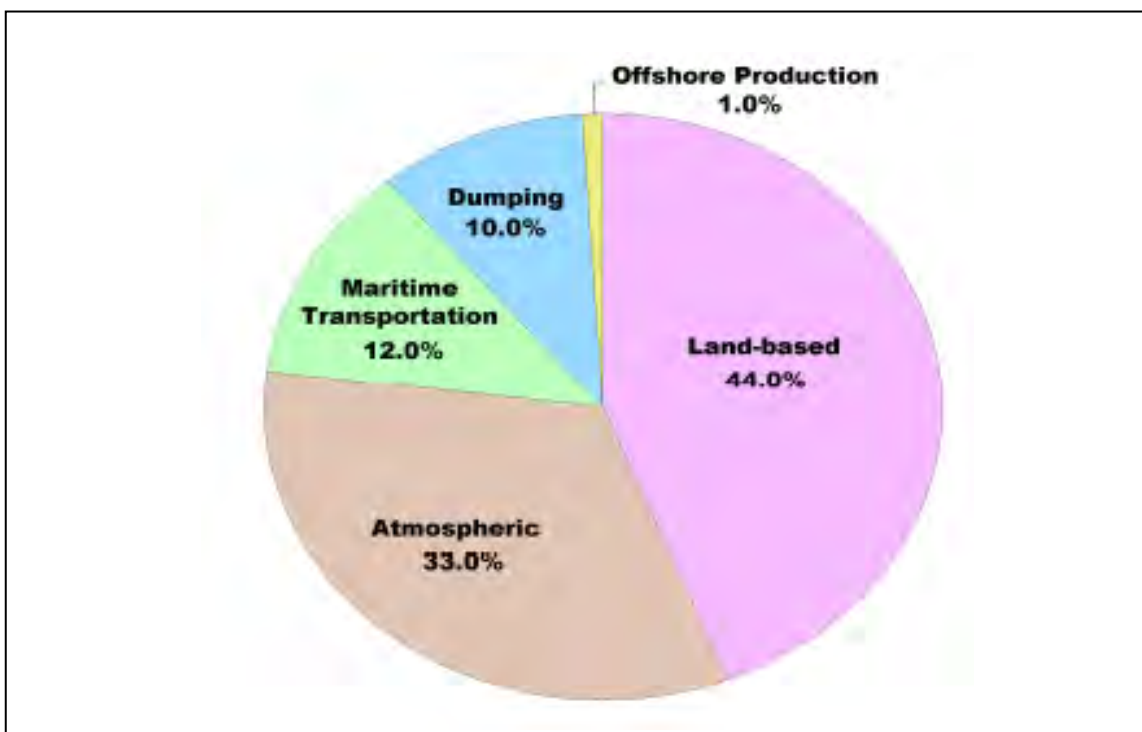


Figure 1: Sources of Marine Pollution

Source: International Maritime Organisation, 2010:1

The research conducted by Taljaard (2008) found that fifteen major land-based activities potentially contribute to the problems and associated environmental impacts and socio-economic consequences in South Africa's coastal marine environment when managed inappropriately. These, as indicated in Fig 2, are:

- Coastal infrastructure development (including transport and recreational facilities);
- Municipal wastewater (mainly domestic sewage effluents and septic tanks seepage);
- Industrial wastewater (including wastewater from dockyards);
- Urban storm water (including diffuse domestic wastewater runoff from informal settlements);
- Solid waste disposal (including littering);
- Port and harbour operations (including dredging);
- Off-road vehicles (e.g. boat launching and beach driving);
- Atmospheric deposition; and
- Introduction of alien vegetation to the coastal zone Taljaard (2008).

LAND-BASED ACTIVITIES	RESPONSIBLE DEPARTMENT (SECTOR)	PROBLEM											
		Siltation	Modification of streambeds	Coastal erosion	Destruction of dunes & sandy shores	Destruction of coastal habitat	Microbial contamination	Eutrophication	High Suspended solids	Marine litter	Thermal pollution	Toxic chemical pollution	Alteration of salinity distribution and nutrient supply
Climate change	Environment Affairs	●		●	●	●				●			●
Coastal infrastructure development	Environment Affairs Housing Municipalities Department of Local and Provincial Government	●	●	●	●	●	●			●			●
Mining	Minerals and Energy Environmental Affairs	●	●	●	●	●				●		●	●
Freshwater abstraction and flow modification	Water Affairs	●	●	●	●	●				●			●
Municipal wastewater	Water Affairs Environmental Affairs		●				●	●	●	●		●	●
Industrial wastewater*	Municipalities Industries						●	●	●		●	●	●
Urban storm water	Water Affairs Environmental Affairs Municipalities Housing						●	●	●	●		●	
Agricultural practices	Agriculture	●					●	●	●			●	●
Port and harbour operations	Transnet: NPA	●	●	●	●	●	●	●	●	●		●	●
Off-road Vehicles	Environmental Affairs			●	●	●							
Solid waste disposal	Environmental Affairs Municipalities									●		●	
Atmospheric deposition	Environmental Affairs Municipalities							●				●	
Introduction of alien vegetation	Environment Affairs Conservation Boards					●							
Harvesting of living resources**	Environmental Affairs					●							
Aquaculture**	Environmental Affairs Water Affairs Department of Aquaculture				●	●	●	●	●			●	

* Including wastewater from fish and food processing industries, textile industries, tanneries, paper and pulp mills, chemical and pharmaceutical factories, fertilizer factories, desalination plants, power stations (e.g. cooling water); ** Here limited to impacts on physical habitat and pollution (as noted)

Figure 2: Land-based pollution activities

Source: Taljaard, 2008:5

The SAN is acutely aware of the potential impact that land-based naval activities can have on the marine environment when managed inappropriately.

The environmental policy of the SAN is therefore based on the national legislative framework of South Africa and to a lesser extent by international treaties and conventions (Gericke, 2010). The environmental policy (South African Navy, 2006) stipulates that all naval activities must be aligned with the principles of sustainable leadership. It is thus in the best interest of the SAN to ensure that all naval strategic objectives are focussed upon integrating environmental related priorities into measurable outcomes such as a MPATP (Gericke, 2010) and thereby limiting the impacts upon the marine environment from land-based activities (Taljaard, 2008). In

addition, these naval programmes of action must be integrated with the national objectives and other relevant programmes in relation to sustainable development. It is already an imperative of national government to ensure that there are the necessary administrative and management structures to support the NPA.

One of the main threats to sustainable coastal management in South Africa is diminishing expertise in government departments, from national to local level. There are several reasons for this situation, one being the lack of continuity where departments are unable to maintain a critical mass of expertise to implement management and administrative functions. This is a complex issue with no simple solutions. Aspects to consider include:

- Basic qualifications (e.g. appropriate tertiary education); and
- Skills and experience (e.g. through job-specific training programmes)

The situation needs to be addressed by creating an enabling environment where there is the political will, as well as effective leadership and motivation. Of great importance is skills retention to facilitate mentorship of new recruits. Although appropriate basic qualifications are essential, the development of skills and expertise specific to the management and administrative functions within departments is often lacking (Taljaard, 2008). For example, policies, legislation and best practice guidelines are usually developed at the national (or provincial) levels without ensuring proper communication to the local level where they are implemented (Taljaard, 2008). Dedicated training programmes can also become useful support elements. In South Africa, DEAT provides national leadership for promoting sustainable coastal development in South Africa. The Department recognises that the more people are informed about our coast, the easier it will be to protect it, and ensure that its development is to the benefit of current and future generations. To this end, it established a special programme, CoastCARE, to assist with education and the exchange of information about coastal issues primarily aimed at the implementation of the White Paper for Sustainable Coastal Development in South Africa (Department of Environmental Affairs and Tourism, 2000).

The Department of Defence is very specific in its reference to the handling of environmental matters through its environmental policy and the link to compliance and its strategic business plan. The SAN is also very explicit in its commitment through its environmental policy towards preventing and combating pollution in all the various forms on land and at sea (South African Navy, 2006).

Maritime zones and boundaries however require the inclusion of estuaries and lagoons as part of the MPATP and therefore needs to be defined and conceptually explained (Glazewski, 2010; Glazewski, 2009: 304).

Basic practical knowledge within the parameters of legal concepts and principles also includes an understanding of “what to do when”, during an observed transgression. The knowledge of the different types of pollution and the statutory non-compliance thereof requires certain skills (South African Qualification Authority, 2011b) that include the following:

- Network and liaise with the responsible environmental pollution experts and with communities.
- Use alkalis to neutralise acids, prevent further pollution through correct clean-up methods.
- Propose corrective measures for some pollution situations.
- Describing safety precautions on board ship.
- Undertake follow-up assessment and monitoring procedures at the conclusion of the project.
- Collect soil, water or air samples and facilitate analysis.
- A description is given of overboard discharge and monitoring procedures with reference to a vessel's international oil pollution prevention certificate.
- Records showing the correct method and location for the disposal of oil residues and garbage are maintained according to regulation requirements.

This is of importance especially in foreign ports where conventions and treaties are applicable (Glazewski, 2010).

1.2.2. International Conventions and Treaties

In terms of the Constitution of South Africa, Section 231(1) (Constitution of the Republic of South Africa, 1996), the Constitution provides that “an international agreement binds the Republic only after it’s has been approved by resolution in both the National Assembly...”. As stated earlier, South Africa is a Member State of the United Nations and as such is subject to international environmental conventions. The Constitutional provisions stated above determine the extent to which South Africa is bound by international conventions (Department of Defence, 2003).

In order to promote the international protection of the environment from degradation, a number of environmental conventions have been put in place. Out of a large number of environmental conventions, a selection of those that are relevant to the DOD and its activities have been made and are as follows (Department of Defence, 2003; Taljaard, 2008):

Firstly, Agenda 21 is the internationally accepted strategy for sustainable development, decided upon at the United Nations Conference on Environment and Development held in Rio de Janeiro, 1992 (United Nations, 2010c). Agenda 21 is a plan for use by governments, local authorities and individuals to implement the principle of sustainable development contained in the Rio Declaration. This document has significant status as a consensus document adopted by about 180 countries.

Secondly, the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA) was adopted in November 1995. The GPA is designed to assist states in taking action individually or jointly within their respective policies, priorities and resources that will lead to the prevention, reduction, control or elimination of the degradation of the marine environment, as well as to its recovery from the impacts of land-based activities. The GPA builds on the principles of Agenda 21. The GPA identifies the Regional Seas Programme of the United Nations Environmental Programme (UNEP) as an appropriate framework for delivery of the GPA at the regional level. South Africa is a signatory to the 1996 Protocol to

the Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matter 1972, as amended. The Protocol defines dumping, amongst others, as “any deliberate disposal into the sea of waste or other matter from vessels, aircraft, platforms or other man-made structures at sea” (Taljaard, 2008). In terms of the definition, the London Convention primarily deals with dumping of waste that occurs at sea, and does not explicitly list disposal of land-derived wastewater to coastal marine waters via a marine outfall or pipe as part of the definition of dumping. Nevertheless, towards achieving a unified and integrated approach to pollution control and waste management of South Africa’s marine environment, it is important that the objectives and general obligations of these Protocols be considered (Taljaard, 2008).

1.2.3. National Environmental Legislation

An important legal factor within a MPATP is the government structure and the differentiation between the local, provincial and national spheres that gives effect to the different legal prescripts based on the Constitution (Glazewski, 2010).

It is however important that the three arms of government consisting of the legislature, the executive and the judiciary systems are brought into context on how it interfaces with co-operative governance (Glazewski, 2010).

Although legal terminology within a MPATP might become confusing it is however important to make brief mention of legal tools such as criminal law and civil law that are available to governmental institutions, industry and citizens alike in the event of an individual or a collective being found in contravention of the promulgated legislative requirements (Glazewski, 2010).

In demonstrating its resolve to comply with international environmental conventions and promote proper environmental management values in the country, Parliament has enacted the National Environmental Management Act 107 of 1998. This Act is of importance for new recruits due to its statutory impact on various military policies and departmental instructions. According to Glazewski (2010), it is important for new

recruits to take cognisance of the existence of various different governmental policies in order for them to comprehend the critical importance to protect and improve the state of our natural resources.

These policies (Taljaard, 2008) include the following:

- White Paper: National Water Policy (April 1997). This policy serves as a guide to government when the process of revising the Water Law takes place. It contains 28 key principles and objectives (Taljaard, 2008). It is thus important for recruits to be aware that the Water Act partly derives from the legal framework as set out in this White Paper.
- White Paper on Environmental Management Policy (July 1997). The main objective of this White Paper is to make the citizens of South African aware of the government's environmental management objectives. It furthermore also explains the process to be followed in order to achieve the set objectives, and communicate to governmental organisations what these objectives consist of. The above-mentioned information will then allow these and what they must do to achieve those objectives (Taljaard, 2008).
- White Paper on Integrated Pollution and Waste Management for SA (March 2000). It is with this White Paper in mind that the government initiated a new approach in relation to integrated waste management and more specifically pollution. It is also partly because of this policy and the increasing statutory obligations placed by the state on governmental organisations such as the Department of Defence (Department Of Defence, 2003; Department Of Defence, 2007) that the feasibility of a MPTAP are being assessed at SAS SALDANHA (Taljaard, 2008).
- White Paper for Sustainable Coastal Development in South Africa (June 2000). This policy is an important legal prerequisite due to the nature of the movement by the SAN and the possible risk (Department Of Defence, 2007) and conflict that might affect the sustainable development of South Africa's coastline (Taljaard, 2008)
- Constitution of the Republic of South Africa Act 108 of 1996. According to Taljaard (2008) the "Constitution is relevant to pollution and waste management

for two reasons. Firstly, the Bill of Rights (Chapter Two of the Constitution) contains a number of rights relevant to integrated pollution and waste management. To the extent that an Act or particular statutory provision does not uphold these rights, it may be unconstitutional. Secondly, the Constitution provides the legal basis for allocating powers to different spheres of government, and is thus relevant to the institutional regulation of integrated pollution and waste management". It is therefore important for new recruits to be aware of their and societies rights contained in the Constitution.

- National Water Act 36 of 1998. This act is particularly important due to the fact that it is the main legislation for the management and control of land-derived wastewater disposal to the marine environment in South Africa" (Taljaard, 2008). All water uses are listed in this Act. One of the more important activities being wastewater disposal is specifically listed and mention is made that a licence is required and obtainable from the Department of Water Affairs and Forestry (Taljaard, 2008).
- Hazardous Substances Act 15 of 1973. The main function of this act is "to provide for the control of substances which may cause injury or ill health or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature". This Act focuses more on human health than on environmental health (Taljaard, 2008). The type of risk prone environment in which new recruits will find themselves during training and more specifically whilst onboard naval vessels necessitates them to be aware of the statutory conditions applicable on them and their employer.
- The Dumping at Sea Control Act 73 of 1980 This Act provides for the control of dumping of substances in the sea. This Act gives legal effect in South Africa to an international convention, namely, the London Convention for the Prevention of Marine Pollution by Dumping of Wastes and other Matter, 1972 (amended in 1978, 1980 and 1989). „Dump“, in relation to any substance, means deliberately to dispose of at sea from any vessel, aircraft, platform or other man-made structure, by incinerating or depositing in the sea. It does not, however, include the disposal at sea of any substance incidental to, or derived from, normal operations of a vessel. Nor does it include legally depositing at sea any substance for a purpose other than its mere disposal.

In South Africa, the International Convention for Prevention of Pollution from Ships Act 2 of 1986 gives legal effect to the International Convention for the Prevention of Pollution from Ships 1973/78 (MARPOL) in South Africa, as well as Annex I (regulations on oil) and Annex II (regulations on noxious liquid substances in bulk) of the Convention.

With regard to the disposal of garbage from ships, Annex V of the International Convention for the Prevention of Pollution from Ships 1973/78 (MARPOL) states: „Regulations for the Prevention of Pollution by Garbage from Ships“, applies. Annex V prohibits any form of disposal of garbage, which it defines as “All kinds of victual, domestic and operational waste, excluding fresh fish and parts thereof, generated during a normal operation of the ship and liable to be disposed of continuously or periodically except those substances which are defined or listed in other annexes to this present Convention“. South Africa is in the process of drawing up the necessary regulations to implement Annex V (Taljaard, 2008).

In 1991, the Marine Environment Protection Committee (MEPC) of the International Maritime Organisation adopted recommendations on International Guidelines for Preventing the Introduction of Unwanted Aquatic Organisms and Pathogens from Ship's Ballast Water and Sediment Discharges, as resolution MEPC 50(31) (Taljaard, 2008). It is the intention that these guidelines form the basis for a new technical annex to the MARPOL Convention. According to Taljaard (2008) above guidelines acknowledge that ‘... port states and administrations have a responsibility to ensure that ballast water, loaded in their ports and harbours, does not contain plants, animals or pathogens that pose a threat to the waters of other states“.

At present, the authorities rely on the older Act (i.e. Prevention and Combating of Pollution of the Sea by Oil, Act 6 of 1981). This Act provides for the protection of the marine environment from pollution by oil and other harmful substances, the prevention and combating of such pollution, and the determination of liability in certain respects for loss or damage caused by the discharge of oil from ships, tankers and offshore installations. This Act gives the Minister of Transport wide-ranging powers regarding the prevention of oil pollution. However, any power, duty

or function regarding the combating of pollution of the sea by oil has been assigned to the Minister of Environmental Affairs and Tourism with effect from 20 May 1986. The implication of this is that the DEAT is responsible for protection and clean-up measures to be taken once oil has been released to sea (whereas oil within the confines of a ship is the responsibility of the Department of Transport) (Taljaard, 2008).

Legislation aimed at providing compensation when an oil spill has occurred is also adopted in the Prevention and Combating of Pollution of the Sea by Oil Act 6 of 1981. The chief international convention given effect in this legislation is the Civil Liability Convention of 1969 (Glazewski, 2009; Taljaard, 2008).

Pollution in harbours is mainly regulated by the legal regime governing land-based sources of pollution as discussed earlier, as well as by legislation applying to a specific type of harbour (i.e. whether it is a commercial harbour, a fishing harbour or a naval harbour) (Glazewski, 2000). Commercial harbours fall under the Legal Succession to the South African Transport Services Act 9 of 1989 that repealed the South African Transport Services Act 65 of 1981. However, important regulations passed under this Act, e.g. the „Harbour Regulations“ are specifically preserved by the 1989 Succession Act (Glazewski, 2000).

The actual origin of international environmental law requires contextualisation by the referral to documents compiled through the coordination of the United Nations during the 1972 Stockholm Declaration and the follow-up on it by the 1992 Rio Declaration where conventions on biological diversity and climate change were addressed (Glazewski, 2009: 34). The World Summit on Sustainable Development in 2002 and its change in focus from drafting principles to the actual implementation thereof is of importance to naval recruits as well as their continued awareness to integrate these principles into their daily activities (Glazewski, 2010). Important conventions that should be in all MPATP"s are the United Nations Convention on the Law of the Sea, the Ballast Water Convention as well as the Prevention of Pollution from Ships Convention and the London Convention (Glazewski, 2009).

Not only is it important to take cognisance of these international legislative prerequisites, but it is important to have a basic understanding of the institutions such as the United Nations Environmental Programme (UNEP) and the International Maritime Organisation (IMO) that are partly responsible for developing the various conventions (Glazewski, 2009; Taljaard, 2008). These conventions are the framework with which national environmental legislative framework and governmental training programmes are aligned.

1.2.4. SAN Education, Training and Development Policy Requirements

The vision that the SAN identified of being “unchallenged at sea” (SA Navy, 2010a) sets a goal that requires maximum maritime competency amongst its learners, including new recruits (SA Navy, 2010a).

The SAN (South African Navy, 2010b) is committed to have all its training institutions accredited to ensure trained, accredited members that will receive recognition for their qualifications outside the SANDF. The SAN has identified the following two major areas of development. Together they create a holistic approach to the professional and personal development of members in the SAN.

- **Professional Functional Development.** “This includes any platform or combat specific training. The development and training are aligned with civilian standards (where possible) to ensure members of the SA Navy are not only employed, but also employable. Personal Development involves general military training, as well as learners practicing fire-fighting skills, training in subjects such as financial planning and management. The development includes required tertiary educational programmes, which forms the foundation of further professional/functional development (South African Navy, 2010b).
- **Leadership/Management and Command Development.** Leadership development in the SAN “focus on ensuring the members” critical thinking skills have been developed to ensure healthy interaction between people in

the organisation, linked to the mission articulated by higher authority” (South African Navy, 2010b).

The new recruits that report at SAS SALDANHA for BMT and that form part of the MSDS is part of what Coetzee *et al.* (2009: 78) noted as the organisation’s intent to “right-skill” the workforce through their education, training and development efforts. The SAN thus has an obligation towards the ASGISA drive and the larger international environment in terms of the contribution to the merchant navy industry. It is therefore important that the SAN maintain a “continuous learning process that should not only focus on the needs of the SAN, it should also prepare the individual to exit the organisation with skills and qualifications that would allow for employment outside the SA Navy” (SA Navy, 2010b: 1).

All new recruits applying to be accepted for BMT have to meet certain criteria (Appendix 5 - 7) in order to meet the selection process of the MSDS. The generic profile of the recruits is as follows:

- Recruits must have obtained a Grade 12 qualification, with 80% of the complement having successfully completed mathematics and science at Grade 12 level. All recruits must be able to read, write and understand English at a level equivalent to National Qualifications Framework Level 4.
- They may not be younger than 18 and not older than 22.
- Will preferably be single with no dependants.
- Will not be area bound.
- Will comply with the South African National Defence Force Medical Standards.
- Have no criminal record

The Department of Defence as a key stakeholder at national level should therefore ensure alignment with the national strategic imperatives in terms of the review and continuous integration of its environmental policy into all military activities to ensure that socio-economical and educational gaps are addressed.

The research conducted by the Department of Defence (2007) suggests that the level of awareness regarding waste and more specifically pollution issues varies amongst members within the military. Environmental Awareness Programmes and any other similar education and awareness training programs must be included in the environmental education and awareness plan of a military establishment in order to:

- Ensure that members are aware of the negative implications of poor waste management practices on mission success, human health and the environment.
- Increase awareness of, and concern for, waste issues and to assist in developing the knowledge, skills, values and the commitment necessary to achieve sustainable development.
- Educate members in a new paradigm of pollution, waste minimisation, reduction, recycling, re-use and safe disposal.
- Create waste recycling and re-use opportunities with financial, institutional and educational support from the appropriate levels within the military departments.
- Ensure that all members act together and support the waste management programme.
- Maintain pollution-training records.

The development of an Environmental Education and Awareness Training (EE&T) plan (Department of Defence, 2007) should include the following:

- Identify opportunities for EE&T in the unit.
- Ensure that all personnel undergo appropriate education and awareness training regarding Integrated Waste Management practices when joining a unit/ship.
- Ensure all deploying personnel receive marine pollution awareness training as part of their induction training.
- Ensure that Integrated Waste Management considerations and emergency response planning is included in the in-post and functional training of members within a unit.

- Provide education and awareness training to units that operate waste treatment plants as well as incinerators in order to empower personnel to manage these plants in accordance with legislative requirements.
- Assign responsibilities with regard to EE&T to a qualified member who will also maintain training certificates and training records.

1.2.5. SETA Unit Standards on Marine Pollution Training

The SETA's main objective is the raising and bringing of skills to the employed, or those wanting to be employed in each sector. The training must be portable and must be subject to quality control and where appropriate be compared with best international standards. Each SETA must be recognized by the South African Qualifications Authority (SAQA) as an Education and Training Quality Assurer (ETQA) (The South African Labour Guide, 2011).

The functions and duties of a SETA are to:

- Develop a sector skills plan;
- Implement the sector skills plan;
- Develop and administer learnership;
- Support the implementation of the National Qualifications Framework;
- Undertake quality assurance;
- Disburse levies collected from employers in their sector; and
- Report to the Minister of Labour and to the SAQA.

Although several Unit Standards exist that relates to BMT, the latest guideline issued by the SANDF (South African National Defence Force, 2009) does not give proof of any alignment with the National Qualifications Framework registered Unit Standards. It is however, the intent of the SANDF to ensure alignment of all subsequent reviews and amendments of the learning programme with the relevant Unit Standards (South African National Defence Force, 2009).

Currently there are two SETA"s that provide for education and training within the SAN. These SETA"s include the Transport Education and Training Authority (TETA) and the Safety and Security Sector Education and Training Authority (SASSETA) (The South African Labour Guide, 2011). The Maritime Chamber of the TETA (Transport Education and Training Authority, 2011) is functional in the "environment of ocean and coastal shipping, ocean and coastal fishing, port activities and associated land-based activities".

The SASSETA (Safety and Security Sector Education and Training Authority, 2011) are comprised of different chambers of which the Defence Chamber is one. This chamber has only recently been added within the SASSETA. It represents Department of Defence and the South African National Defence Union amongst others.

The South African Qualification Authority (2011a) has however, several Unit Standards registered (South African Qualification Authority, 2011b) that indicate the type of standards already set for training in marine pollution awareness. These Unit Standards are as follows:

Manage pollution and pollution control, SAQA US ID - 8407

Recruits that have been assessed as competent against this unit standard "will be able to assess a pollution incident and assist in implementing a plan to control and prevent further environmental damage. This competence will contribute to a clean, healthy and safe environment. Achieving this competence will enhance the qualifying learner"s employability and serve as a basis for further learning".

Explain pollution control and safe working practices, SAQA US ID - 243999

Recruits that have been assessed as competent against this unit standard "will be able to describe the precautions to be followed in order to prevent pollution to the marine environment. They are also able to apply safe working practices to ensure their own and others' safety as well as respond to emergencies".

Demonstrate knowledge of compliance with pollution prevention requirements SAQA US ID - 261000

This unit standard provides a basis for recruits within the Maritime Sector who intends to work as an officer on the bridge of a ship. The recruit who successfully completes this Unit Standard will “gain essential knowledge and practical skills to manage compliance with current maritime legislation, codes and practices, pollution prevention policies and procedures”.

Examples of these knowledge and skills are the following:

- Whom to contact for particular types of pollution events.
- Pollution and its effects on local communities and ecosystems.
- Basic waste management.
- Best practice with respect to waste management.
- Identifying types of pollution.
- Basic local climatological knowledge.
- Recycling.
- Alternative waste disposal technologies.
- Waste - Animal interactions (problems and solutions).
- Water reclamation and recycling.
- Educational programmes.

According to the South African Qualification Authority (2011a) the competencies achieved by learners in the above unit standard will, “contribute to the economic upliftment of the country, and in the case of the South African Navy, contribute the preservation of human life and the defence of South African warships, territorial waters and/or area of responsibility, thus providing a safer and secure society for South African citizens”.

From the above Unit Standards, it is evident that formulation of Unit Standards in terms of marine pollution education and training has taken place.

1.2.6. International MPATP Learner Opportunities

Marine pollution awareness training within a naval context seems to be still in its infancy stage within the international environment. However, according to South African Department of Defence (2005: 1) there is global recognition that world dynamics are creating new environmental challenges and requirements for military organizations worldwide. At the same time, military mission readiness must not be impaired; defence organisations must be able to train their troops and sustain their installations in an environmentally sound manner.

The United States Army advises all its military units to utilise and interact with all possible sources that specialise in environmental education and training such as academies, private consultants and to make use of workshops and conferences. The United States Army has however decided to develop training programmes if environmental training courses do not exist. These proposed programmes are coordinated by their higher ETD authorities (United States Army, 2007). Similarly, the SANDF and more specifically the SAN has also identified the same shortage in its ETD environment.

According to research (Australian Maritime College, 2010), the students that successfully graduate from the Australian Maritime Colleges' National Centre for Marine Conservation & Resource Sustainability have proven to display the capability and competency to make a difference both individually and collectively. These graduates have the necessary skills and knowledge to properly assess and identify marine threats and more importantly to identify the source and possible solutions.

The Massachusetts Maritime Academy (2010) has a similar training program as the MPATP investigated by the researcher. The modules presented in this pollution control programme consist of the following:

- Ecological Consequences of Marine Pollution
- Marine Pollution and Vessel Engineering Systems
- Marine Pollution and Deck Operations

- Legal Issues in Marine Pollution
- Environmental Communication in the Maritime Industry (Massachusetts Maritime Academy, 2010)

However, the education background of the undergraduates enrolling at the Massachusetts Maritime Academy is very different from that of their South African counterparts enrolling within the MSDS programme.

The requirement for national and international marine pollution awareness training is clearly described and supported by the extent to which regulatory bodies have produced legislative frameworks, learner standards and policy frameworks. It is however clear from this review that the SAN has realised that it has a responsibility in terms of the regulatory framework and the relevant policy statements to investigate the requirement for a MPATP.

1.3. RESEARCH METHOD

1.3.1. Introduction

This section describes the research design that has been decided upon to achieve the research aim. A description of the research aim and objectives is followed by a description of the design. The researcher decided to employ Evaluation Research as the preferred research method (Babbie, 2008: 384), as the research consisted of an analysis of the training needs (Babbie, 2008: 383; Mouton, 2001: 158) of new recruits at SAS SALDANHA Naval Gymnasium.

The researcher identified specific subject matter experts and engaged them by means of interviews. Archival records pertaining to naval registers were used to develop themes amongst the different data sourced. This was followed by focus group interviews with new naval recruits. The focus was to determine whether there are gaps between the current training competencies of the new recruits on completion of their training and the expected competencies as stipulated in the relevant regulatory frameworks and SETA Unit Standards. The researcher attempted

to determine whether the data collected from subject matter experts, relevant SETA unit standards, SAN policy/systems/reports, training personnel and the interviews with the new recruits indicated any recurring themes regarding training needs.

1.3.2. Objectives of the Research

There are two objectives in this research.

Objective 1: To identify the required competencies expected from a naval recruit in terms of marine pollution awareness. This will be influenced by the following factors:

Basic legislative requirements applicable on a MPATP as provided for by national legislation and international conventions and treaties.

The SAN education, training and development policy requirements.

The SETA Unit Standards on marine pollution training.

Objective 2: To prioritise the knowledge, skills and attitudes.

1.3.3. Research Approach and Method

In conducting a training needs analysis of the training needs of the new recruits at SAS SALDANHA Naval Gymnasium, the researcher is effectively making use of Evaluation Research as the preferred research method.

The researcher, whom in his previous appointment was the Environmental Management Staff Officer in the SAN, has chosen this field of research due to the absence of marine pollution awareness training within the basic military training program of the new recruits.

1.3.4. Research Process

From the onset of the research, the target population for the TNA was already identified and consisted of the new recruits at SAS SALDANHA. This was done

intentionally in order to keep the research topic focussed. From the perspective of initiating a new training intervention, it also makes sense to start with those employees at the beginning of their careers.

It was decided to first establish the regulatory framework that governs the topic of marine pollution before any other research took place. This allowed the researcher to have a better understanding of the various laws and regulatory prerequisites that are aimed at preventing marine pollution. The Internet proved to be an extensive source of the legal information that was required. In addition, personal interviews were held with an internationally renowned legal subject matter expert at the University of Cape Town as well as with a researcher at the Council for Scientific Industrial Research in Stellenbosch who also has extensive experience in marine pollution research.

The next step involved obtaining data from the SAN in the form of interviews. The researcher also had easy access to relevant documents such as the BMT curriculum, the incident register pertaining to environmental contingencies as well as the SAN Environmental Policy.

The data required on existing SETA Unit Standards were obtained via the Internet. The data proved sufficient in terms of the Unit Standards that were required and the detail description regarding the required KSA's expected from learners at National Qualification Framework Level 4.

The researcher analysed the relevant data gathered from interviews, Unit Standards, SAN registers and SAN MSDS BMT curriculum by means of an inductive approach in order to establish data driven codes (Boyatzis, 1998). During the analysis of the data, it was necessary to look for themes in the data. This enabled the researcher to first group, and then code the respective themes that occurred in the transcripts of the interviews as well as other sourced data (Boyatzis, 1998; Babbie, 2008). The steps involved in this approach were a) generating a code, b) reviewing and revising the code, and c) determining the validity of the coder and code (Boyatzis, 1998).

This was done in order to determine whether certain themes are evident, that would help in identifying the relevant KSA"s applicable to a MPTAP. These themes then had to be compared with each other in order to create a code. The researcher categorised the gathered data under three headings, which are also part of the objectives of this research. The researcher attempted to identify recurring patterns or themes between the categories and the respondents and information sourced from archival records. This type of analysis according to Strauss (1988: 20) that is referred to as coding corresponds with that of Boyatiz (1998). The reliability of the code was determined by the judgement received from the respective coders. The interviews with the subject matter experts gave the researcher a deeper understanding of the subject matter. This allowed a comparison between the data detailed in the BMT curriculum, the facts stated by the subject matter experts as well as the standards stipulated by the SETA.

According to McClelland (1993), specific attention should be given to avoid prejudging the results of the research until all the data has been collected. This is important because throughout the research certain patterns will begin to show that will inevitably influence the researchers" viewpoint and objectivity (McClelland, 1993: 18). Gaskell (2000) furthermore argues that the purpose of qualitative research is to explore the different opinions of the research topic and that it is not about counting the opinions, but rather experiencing the different views of the related topic.

Based on the analysis, the relevant KSA"s were identified and prioritised in order to suggest the type of competencies that are expected from new recruits when introducing marine pollution awareness training.

1.3.5. Research Ethics

The researcher ensured that ethical aspects of the research such as informed consent were addressed by informing the respondents on all matters that might affect their honest and unbiased response (Babbie, 2008).

According to Denzin and Lincoln (2000) there are specific guidelines for ensuring ethical conduct during the research process, namely informed consent, no deception, assurance of privacy and confidentiality, and accuracy. The researcher received consent from the SAN to conduct the research from Directorate Fleet Human Resources. The meetings and interaction with stakeholders and role-players was conducted with honesty and integrity by informing them of the background and reasons for the research, what the set research objectives are, and thereby eliminating any form of deception.

The military environment, in which this research took place, necessitated sensitivity towards the confidentiality of information in general and recognised that certain confidential information was made available to the researcher. The researcher therefore took due care, by gaining approval from each interviewee to include information that is not public yet and made sure that integrity is exercised with the data and insights gained.

1.3.6. Research Limitations

The research only focused on identifying and prioritising the required competencies expected from a naval recruit in terms of marine pollution awareness. This research had no intention of broadening this scope. In the light of the recommendations made here, further research would need to address curriculum design, curriculum implementation, monitoring and evaluation.

1.3.7. Conclusion

An Evaluation Report was the preferred research method. The research aim and research objectives were set and followed by a discussion of the research method and of the research process. Data collection techniques were discussed in terms of a brief definition, the type of data gathered, how the collected data were analysed, how it supports the research objectives and how issues such as validity, dependability, credibility and ethics were ensured. Based on the analysis, KSA's were identified and prioritised in order to support the research aim and objectives.

1.4. RESULTS & DISCUSSION

1.4.1. Introduction

The aim of the research was to assess the training needs of naval recruits in terms of marine pollution awareness. A combination of the macro, meso and micro levels of TNA were utilised in the analysis by means of interviews, archival records and information available on the Internet. The data arising from these techniques was analysed using thematic analysis.

1.4.2. Results and Analysis

In the process of conducting research on the qualitative data, a thematic analysis was the preferable method that allowed the researcher to generate a code from the grouped data, which also shared certain similarities. The process of coding allowed for the categorising of the data as well as assigning codes to the data. From these codes, common themes were grouped together (Babbie, 2008). This allowed the researcher to group or categorise the data into common themes. It was therefore necessary to ensure that the thematic analysis is linked to the theory presented in the literature review by grouping the themes based on the knowledge, skills and attitude of new recruits and measured on the macro, meso and micro level within the SAN. The themes are furthermore also impacted upon by regulatory frameworks, SAN policy and Unit Standards of the SETA.

It is important to bear in mind that a TNA within the context of a MPTAP intends to assess whether there is a gap between what the new recruits currently know about marine pollution and what they should know. Through a combination of the research objectives and the coding process of the sourced data, the following themes emerged:

Theme 1: Regulatory importance for recruits to have a basic knowledge of the legislative requirements relevant to marine pollution awareness on the competencies expected from a naval recruit;

Theme 2: The organisational intent of the SAN ETD policy to “right-skill” recruits in order to prepare them with the competencies expected from a naval recruit in terms of marine pollution awareness;

Theme 3: The commitment by the SAN to ensure that new recruits through education aligned with SETA Unit Standards contribute to the economic upliftment of the country by helping to protect and preserve the marine environment, thus providing a more sustainable and secure natural environment for South African citizens;

The themes will be elaborated upon in terms of the TNA conducted on the KSA’s of new recruits on the macro, meso and micro levels.

1.4.2.1. Theme 1: Regulatory importance for recruits to have a basic knowledge of the legislative requirements relevant to marine pollution awareness on the competencies expected from a naval recruit

It has already been mentioned that for the more than thirty years (Goosen, 1973) of the SAN’s existence, there was no requirement to have TNA conducted on marine pollution awareness training. However, over the last decade various factors started influencing the changes in naval policy in terms of investing in human capital through programmes such as the MPATP. These factors included the requirement for increased marine pollution awareness, knowledge of the legal prescripts governing marine resources protection, integrated waste management legislation, as well as the emergence of corporate social and environmental responsibility (South African Navy, 2006; Kidd, 2008: 154).

The intent of a MPATP is therefore to improve the level of knowledge, skills, attitude and behaviour of new recruits regarding marine pollution awareness and simultaneously to sensitise and align the recruits with the strategic intent of the organisation. This should promote a process whereby recruits understand and take responsibility for the impact that they have on the marine environment, both individually and collectively (Department of Defence, 2003; Wagiet, 2002: 27). A

MPATP should inform recruits on who administers what type of environmental enforcement or level of coordination. It could include institutions such as the International Maritime Organisation, the South African Maritime Safety Association, Department of Environmental Affairs, Marine Coastal Management and PORTNET that are responsible for the monitoring of maritime pollution, illegal fishing and sustainable management of all marine resources (Glazewski, 2010).

It would be preferable from the knowledge and skills point of view to include the various internationally and nationally accepted environmental principles. These principles will allow recruits a better comprehension on how the types of pollution and the relevant principles form part of sustainability. These principles such as “polluter pays, cradle to grave and precautionary principle” will form the basis for basic decision-making scenarios that the recruits will encounter.

At present, the SAN utilises the South African Maritime Training Academy (SAMTRA) in Simon’s Town to facilitate all maritime pollution training and analysis for Combat and Technical Officers and junior non-commissioned officers. This however excludes the new recruits trained within the Military Skills Development System, where the BMT programme does not include any form of marine pollution training, and therefore supports the intent of the researcher.

The South African Department of Defence agrees that an essential component of an effective environmental education and training program must include the identification and explanation of the requirements of applicable environmental laws, regulations, policies and standards (South African Department of Defence, 2005).

There is a Constitutional (Constitution of the Republic of South Africa, 1996) but also moral responsibility that rests on the SAN to educate, train and help develop new recruits in protecting their environment and to help them to contribute to a improved protected environment (Glazewski, 2010). The SAN has thus realised that in order for it to be more proactive towards preventing pollutants from entering its marine area of responsibility, it will have to research the different options relating to marine pollution control measures (Department of Defence, 2003). It is therefore necessary

for new recruits to first have a clear understanding of the boundaries accepted by the SAN regarding environmental law, international conventions (see Table 1) and how the three arms of government interfaces through co-operative governance (Glazewski, 2010).

Table 1: List of Knowledge Expected from Recruits (Glazewski, 2009; Taljaard, 2008)

S/No	Type of Regulatory Framework
1	Constitution of the Republic of South Africa Act 108 of 1996, Sec 24 (b)
2	National Environmental Management Act 107 of 1998
3	National Water Act 36 of 1998
4	Hazardous Substances Act 15 of 1973
5	Dumping at Sea Control Act 73 of 1980
6	Prevention and Combating of Pollution of the Sea by Oil Act 6 of 1981
7	Convention on the Prevention of Marine Pollution by Dumping of Wastes
8	United Nations Convention on the Law of the Sea
9	Ballast Water Convention
10	1978 Protocols for Prevention of Pollution from Ships
11	1996 Protocols to the London Convention 1972, as amended
12	International Convention for Prevention of Pollution Act 2 of 1986
13	Agenda 21
14	Global Program of Action for Protection of Marine Environment
15	Types of pollution
16	National and International Sustainability Principles
17	Interface between Arms of Government and Cooperative Governance
18	Definition and Concept of Estuaries/ Lagoons
19	Basic Understanding of Civil/ Criminal Law

The Department of Environmental Affairs and Tourism on national level is acutely aware of the fact that the more people are informed about our coast, the easier it will be to protect it, and ensure that its development is to the benefit of current and future generations (Department of Environmental Affairs and Tourism, 2000). Basic practical knowledge within the parameters of legal concepts also includes an understanding of “what to do when” during an observed transgression. Glazewski

(2010) stated that the “knowledge of the different types of pollution and the statutory non-compliance thereof require certain skills that includes the ability to identify types of pollution is of importance especially in foreign ports where conventions and treaties are applicable”. Gericke (2010) supports this view in that although the majority of naval recruits will not be able to pursue a career in the SAN, it is still important for them to be knowledgeable that South Africa is bound by international agreements should government accede to it. Glazewski (2010) is also supportive of the fact that a MPATP should inform recruits on who administers what type of environmental enforcement or level of coordination.

It would be preferable from the knowledge and skills point of view to include the various internationally and nationally accepted environmental principles. These principles will give recruits a better comprehension on how the types of pollution and the relevant principles form part of sustainability. These principles such as “polluter pays, cradle to grave and precautionary principle” will form the basis for basic decision-making scenarios that the recruits will encounter. The response (MSDS Learner Group, 2011) received from the recruits proved to be similar to the opinions expressed by the respective subject matter experts regarding the importance of including a regulatory framework into a MPATP. It was thus evident that throughout the research a common theme exists in terms of the necessity to have a regulatory framework in a MPATP.

Based on the absence of marine pollution awareness training in terms of the requirements on macro, meso and micro level it appears that there is a definite requirement for new recruits to receive awareness training in terms of basic marine pollution legislation. This will not only broaden their basic knowledge and skills but also affect their attitude in a positive manner towards taking ownership of the marine environment entrusted in their career as sailors (MSDS Learner Group, 2011).

1.4.2.2. Theme 2: The organisational intent of the SAN ETD policy to “right-skill” recruits in order to prepare them with the competencies expected from a naval recruit in terms of marine pollution awareness.

Although information on the subject of marine pollution within the national and international regulatory framework have been put in place there seems to be less information on marine pollution awareness for possible MPTAP"s. The SAN is visibly aware of this framework at the macro level and has environmental policy and plans in place on a corporate level. The SAN (South African Navy, 2010b) is also committed to have all its training institutions accredited to ensure trained, accredited members who will receive recognition for their qualifications outside and thus has identified Leadership/ Command Development and Professional Functional Development as the two major areas of development that will have an impact on the macro, meso and micro level. Together they create a holistic approach to the professional and personal development of members in the SAN (South African Navy, 2010b). The SAN however lags in supporting ETD research with information on what is done towards sensitising new recruits on marine pollution awareness.

It is with the GPA and the NPA as background that the SAN has realised that its environmental policy framework will only be effective in its intent if more proactive systems and programmes regarding waste management and more specifically marine pollution control are implemented (Department of Defence, 2003).

Taljaard (2008) defined the different categories that exist concerning the types of marine pollution, it is however important for new recruits to differentiate between systems that focuses on the prevention of marine litter at source and systems that deal with marine litter once it is found in marine or coastal areas (United Nations Environmental Programme, 2010b). Preventive measures at a meso level would therefore include better education and awareness-raising activities to influence the KSA"s of new recruits. It is thus in the best interest of the SAN to ensure that all naval strategic objectives are focussed upon integrating environmental related priorities into measurable outcomes such as a MPATP (Gericke, 2010) and thereby

limiting the impacts upon the marine environment from land-based activities (Taljaard, 2008).

It is also important for the SAN and new recruits to note that one of the main threats to sustainable coastal management in South Africa is diminishing expertise in government departments, from national to local level. The SAN therefore have to retain these skills as far as possible and new recruits must understand the importance of their contribution to ensuring a sustainable maritime environment. There are several reasons for this situation, one being the lack of continuity where departments are unable to maintain a critical mass of expertise to implement management and administrative functions. It is however advisable to consider aspects such as:

- Basic qualifications (e.g. basic awareness training); and
- Skills and experience (e.g. through job-specific training programmes)

The new recruits at SAS SALDANHA are part of what Coetzee *et al* (2009: 78) noted as the organisation's intent to "right-skill" the workforce through their education, training and development efforts. The BMT curriculum (Appendix 5 – 7) applicable to new recruits however does not give any proof of training relating to sustainable protection of marine resources or marine pollution awareness training in general. Module A of Appendix 5 only refers to Military Law. This legal awareness training does not constitute the type of legislation relating to the marine environment that would form the basis for a MPTAP, but only addresses the SANDF Military Disciplinary Code.

The Department of Defence as a key stakeholder at national level should therefore ensure alignment with the national strategic imperatives in terms of the review and continuous integration of its environmental policy into all military activities to ensure that socio-economical and educational gaps are addressed.

The research conducted by the Department of Defence (2007) suggests that the level of awareness regarding waste and more specifically pollution issues varies

amongst members within the military. Environmental Awareness Programmes and any other similar education and awareness training programs must be included in the environmental education and awareness plan of a military establishment, if pollution incidents are to be effectively managed and controlled.

The frequency in terms of total number of reported environmental incidents (see Appendix 4 to 7) relating to pollutants being spilled came to 29 over a period of seven years. The figure of 29 is only within the Simon's Town area with the exception of Serial No 9 in 2003. No other Environmental Incident Register amongst outlying units within the SAN was available or could be found. The probability that other incidents occurred is high, but the absence of systems and general awareness meant that it not to be reported or documented. The Environmental Incident Register shows that all the reported incidents occurred due to onshore activities, and not by naval vessels whilst out at sea. This finding coincides with the research by Taljaard (2008) and by Glazewski (2010). These activities ranged from drums leaking oil/ fuel, spilling of fuel whilst refuelling, equipment leaking oil to waste ending up on the surface of the water. The number of incidents reported in the Environmental Incident Register appears to have reached a maximum total in 2004 and then declined towards 2010. The decrease could be due to various circumstances but the main concern of the researcher is that the records reflect a situation that is not based on reality. It is highly unlikely that fewer incidents took place considering the amount of naval exercises, operations and daily activities that takes place within the SAN.

The common theme that arises from the archival records, the input from subject matter experts, BMT curriculum and the response from the new recruits (MSDS Learner Group, 2011) all reflect similarities in terms of the SAN wanting to improve the marine pollution awareness competencies of new recruits. It is thus evident that although the SAN commits itself to environmental education and training in its policy statements and corporate strategy there still seems to be a gap in the BMT training programme for new recruits. There seems to be no inclusion of marine pollution training awareness within the BMT programme and therefore an awareness training need exists to address the knowledge, skills and attitude of new recruits at the meso and micro levels.

1.4.2.3. Theme 3: The commitment by the SAN to ensure that new recruits through education aligned with SETA Unit Standards contribute to the economic upliftment of the country by helping to protect and preserve the marine environment, thus providing a more sustainable and secure natural environment for South African citizens.

As the SETA's main objective is the raising and bringing of skills to the employed, it is also important to note the training must be set at the best international standards (The South African Labour Guide, 2011).

At a macro level within the SANDF there seems to be no proof that the BMT is aligned with the National Qualifications Framework registered Unit Standards (South African National Defence Force, 2009). The researcher however found two SETA's that provide for education and training within the SAN namely the TETA and the SASSETA (The South African Labour Guide, 2011).

The TETA (Transport Education and Training Authority, 2011) that focuses on the meso and micro level in terms of knowledge and skills show distinct similarities with the SASSETA (Safety and Security Sector Education and Training Authority, 2011) that comprises of different chambers and of which the Defence Chamber is one.

The South African Qualification Authority (2011a) has several Unit Standards registered (South African Qualification Authority, 2011b) that indicate the type of standards already set for training in marine pollution awareness. These Unit Standards are as follows:

- **Manage pollution and pollution control, SAQA US ID - 8407**

On completion, recruits "will be able to assess a pollution incident and assist in implementing a plan to control and prevent further environmental damage. Achieving this competence will enhance the qualifying learner's employability and serve as a basis for further learning" (South African Qualification Authority, 2011b: 1). It seems that this unit standard is aligned with the intent of the MSDS

to prepare recruits for further employment on completion of the BMT. It would seem that this unit standard addresses the TNA gap found on the meso and micro level and would address the required KSA"s successfully.

- **Explain pollution control and safe working practices, SAQA US ID - 243999**

On completion, recruits "will be able to describe the precautions to be followed in order to prevent pollution to the marine environment. They are also able to apply safe working practices to ensure their own and others' safety as well as respond to emergencies" (South African Qualification Authority, 2011b: 1). This unit standard seems to show a common theme with the above-mentioned unit standard in that it is aligned with the intent of the MSDS to prepare recruits to be able to improve their KSA"s within the TNA process on a meso and micro level.

- **Demonstrate knowledge of compliance with pollution prevention requirements SAQA US ID - 261000**

On completion recruits within the Maritime Sector will be fully trained to work as an officer on the bridge of a ship and "gain essential knowledge and practical skills to manage compliance with current maritime legislation, codes and practices, pollution prevention policies and procedures" (South African Qualification Authority, 2011b: 1). It seems that this unit standard is aligned with the previous two Unit Standards and with the intent of the MSDS to prepare recruits for further employment on completion of the BMT. This unit standard addresses the TNA gap found on the meso and micro level and should address the required KSA"s successfully.

According to SAQA (2011a: 1) the competencies achieved by learners in the above unit standards will, "contribute to the economic improvement of the country, and in the case of the South African Navy, contribute the preservation of human life and the defence of South African warships, territorial waters and/or area of responsibility, thus providing a safe and secure society for South African citizens".

It is clear that from the above-mentioned results that a common theme exists amongst the above mentioned unit standards that relate to the availability of guidelines for the introduction of a MPTAP within the SAN. The MPATP could also be directly supportive of suggested crosscutting support elements to the NPA such as:

- Institutional structures and arrangements to coordinate sectors and sectoral institutions to facilitate cooperative governance;
- Capacity building (human resource development and education) specifically aimed at developing skills and capabilities in coastal marine research and management; and
- Public participation and awareness (Taljaard, 2008).

1.4.3. Conclusion

A thematic analysis of all the gathered data relevant to the marine pollution awareness training needs on the macro, meso and micro levels within the SAN was conducted.

The gathered data proved to be sufficient in allowing the researcher to generate a code from the grouped data, which also allowed the researcher to group common themes together.

As was already mentioned it was important for the researcher to utilise the TNA process within the context of a MPTAP in order to assess whether there is a gap between what the new recruits currently know about marine pollution and what they should know. The researcher did indeed find common themes relating to the required KSA"s on the macro, meso and micro level.

The legal theme has as its base the Constitution as regulatory foundation but also the moral responsibilities that rest on the SAN to educate, train and positively influence the attitude of new recruits in protecting their environment and to help them to contribute to an improved protected environment. The resulting codes from the

researched data that included subject matter experts, policy on macro level within the SANDF and information retrieved from the internet were grouped together in themes that showed distinct similarities. Basically the training need for recruits to first have a clear understanding of the boundaries accepted by the SAN regarding environmental law, international conventions and how the three arms of government interfaces through co-operative governance seems to be consistent between all data sources. This would include a basic practical knowledge and understanding within the parameters of legal concepts of “what to do when” during an observed transgression. Knowledge of the different types of pollution and the statutory non-compliance require certain skills that includes the ability to identify types of pollution is of importance especially in foreign ports where conventions and treaties are applicable. A combination of improved knowledge and skills should form the basis for new recruits to adopt a more informed and positive attitude towards taking responsibility for the marine environment.

The SAN is aware of the legal framework at the macro level and has environmental as well as ETD policy and plans in place on a corporate level. The SAN however lags in supporting ETD and environmental management policy with research on what is to be done towards improving the KSA’s of new recruits on marine pollution awareness. It is with campaigns at national level as background that the SAN has realised that its ETD and environmental policy framework will only be effective in its intent if more proactive systems and programmes regarding waste management and more specifically marine pollution control are implemented at meso and micro level. Systems and programmes would therefore include better education and awareness-raising activities to influence the KSA’s of new recruits. The different themes that resulted from the researched data all support the fact it is in the best interest of the SAN to draft new policy that will ensure that all naval strategic objectives are focussed upon integrating environmental related priorities into measurable outcomes such as a MPATP and thereby limiting the impacts upon the marine environment from land-based military activities. Seeing that the new recruits at SAS SALDANHA are part of the organisation’s intent to “right-skill” and inculcate a positive attitude amongst the workforce through their education, training and development efforts,

specific attention should be given to the lack in ETD policy that relates to marine pollution awareness training on a macro, meso and micro level.

As the SAN is already utilising the unit standards set by the SETA, it should also be focussed upon the improvement of skills and attitude amongst the new recruits as to ensure that the KSA's addressed through its BMT programme is measured against best international standards. However, at a macro level within the SANDF there seems to be no proof that the BMT is aligned with the SETA Unit Standards. The researcher however found two SETA's with unit standards that provides clear guidelines for the introduction of a MPATP within the SAN namely the TETA and the SASSETA. The above-mentioned unit standards that have common themes is focussed on the meso and micro level and compare with the intent of the MPATP to increase the KSA's of new recruits.

1.5. SUMMARY OF FINDINGS

The priority that the KSA's therefore take is first a basic legal knowledge and understanding of the regulatory framework that is applicable on marine pollution. This understanding will form the foundation for recruits to have the ability to know "what to do when" during observed transgressions or pollution that has been discovered are also of importance. The priority skills expected from new recruits includes the ability to identify the different types of pollution, to explain pollution control and what safe working practices comprise of and the ability to differentiate between systems that focus on the prevention of marine litter at source and systems that deal with marine litter once it is found in marine or coastal areas respectively. The priority attitudinal components expected from new recruits should include a positive disposition towards the importance of the individual's contribution to ensuring a sustainable maritime environment as well as a positive attitude towards contributing to the preservation of human life and the defence of South African warships, territorial waters and/or area of responsibility, thus providing a safe and secure society for South African citizens. A well-entrenched understanding supported by clearly developed skills will form the basis for recruits to display

sustained custodianship and distinct confidence on how to protect and preserve the marine environment.

Table 3: List of Priority Knowledge, Skills and Attitude

S/No	Type	1 st Priority	2 nd Priority
1	Knowledge	<p>Knowledge of the national environmental law, policy and the respective definitions</p> <p>Understanding of “what to do when” observing a transgression</p> <p>Knowledge of the different types of pollution</p> <p>Knowledge of the various internationally and nationally accepted environmental principles</p> <p>Knowledge of who administers what type of environmental enforcement or level of coordination</p> <p>Knowledge on how the three arms of government interfaces through co-operative governance into environmental legislation</p>	<p>Basic understanding of international treaties and conventions</p> <p>basic decision-making scenarios that the recruits will encounter</p> <p>Basic Understanding of Civil/ Criminal Law</p> <p>Basic understanding that South Africa is bound by international agreements should government accede to it</p>
2	Skills	<p>The skills to identify types of pollution</p> <p>The skill to be able to explain pollution control and safe working practices</p> <p>Ability to differentiate between systems that focuses on the prevention of marine litter at source and systems that deal with marine litter once it is found in marine or coastal areas</p>	<p>Completion of required documentation related to a spill in accordance with regulations and SAN procedures</p> <p>Use of equipment to control an oil spill or pollution incident</p> <p>Network and liase with the responsible environmental pollution experts and with communities</p>
3	Attitude	<p>Positive attitude towards the importance of the individual’s contribution to ensuring a sustainable maritime environment</p>	<p>Improved attitude towards contributing to the economic improvement of the country</p>
		<p>Improved attitude towards contributing to the preservation of human life and the defence of South African warships, territorial waters and/or area of responsibility, thus providing a safe and secure society for South African citizens</p>	

The prioritisation of the KSA’s are the result of the TNA conducted on macro, meso and micro level within the SAN as well as the input received from the various subject

matter experts, the national and international regulatory framework, SAN policy, the current BMT curriculum and the documentary proof obtained from archival records.

The researcher is left with the inescapable conclusion that there is a definite need on the macro, meso and micro level for a MPATP amongst new recruits. This finding is based on the relevant regulatory framework applicable on marine pollution, the SAN policies relating to environmental management and ETD as well as the marine pollution unit standards registered by the TETA and SASSETA. The strategic intent of the SAN indicate that a heightened level of awareness need to be established within training programmes if the national marine resources are to be protected according to principles of sustainability. The tasks given to new recruits as part of their training and their general application after training require an improvement in their competencies to deal with pollution. This is extended in their further career progression should they decide to leave the SAN and move back to the private sector.

Therefore, it is evident that there are very specific regulatory frameworks set out on national level, but it needs to be integrated into possible future MPATP"s within the SAN on meso and micro level.

1.5.1. Possible Implications

One of the most important implications that the SAN should consider is the legal and financial effect that an environmental contingency would have on the marine life and the reputation of the SAN as custodian of the marine environment. As it stands the SAN as custodian of the natural environment, should be pro-active in its approach towards protecting the environment in which it operates. The situation in the past has resulted in frequent spills on land that could have been prevented if members of the Fleet had been given awareness training on marine pollution prevention. Currently the situation is still ongoing and although the SAN has promulgated policy and environmental management plans on the macro level, there still seems to be a gap in the actual training of recruits when commencing with their BMT at the Naval Gymnasium in Saldanha.

The medium to long-term effect that the absence of a MPATP will have on the KSA's of combatants will also limit their ability to know how to mitigate situations where marine pollution is imminent. This not only jeopardises the operational preparedness of the SAN but also reflects negatively on the SAN as a major naval force on the African Continent.

1.5.3. Recommendations

The development of an EE&T plan (Department of Defence, 2007) or in the context of the SAN, a MPTAP, should include the legal prescripts, the necessary SAN ETD and SAN Environmental Policy prerequisites as well as appropriate education and awareness training regarding Integrated Waste Management practices when joining a unit/ ship and ensure that all recruits understand their individual and collective responsibilities. Based on the data gathered it would appear that a general awareness of the legal prescripts would take preference but that it should be presented in a way that supports the improvement of the required skills expected from new recruits when faced with marine pollution. Ultimately, these two competencies should result in an improved positive attitude amongst new recruits towards taking responsibility for their marine area of operations. The researcher therefore recommends that based on the research and in terms of KSA's first priority should be given to knowledge, followed by skills and then attitude.

The BMT that the SAN provides to new recruits should empower them to be more competent towards taking individual but also collective responsibility for the marine environment in which they serve.

Finally, prior to this study there was no significant empirical research conducted or findings presented on a marine pollution awareness training programme in the SAN. Since this research appears to establish the first empirical confirmation of the training need amongst new recruits, it will require further research in terms of curriculum design, curriculum implementation and the evaluation thereof. It would therefore be in the best interest of the SAN to ensure the integration of a MPATP into the planning phase of future BMT Curriculum's. It would also be advisable to

communicate this intent with all the relevant stakeholders in order to ensure alignment with governmental organisations as well as the private sector where these new recruits can be employed based on their newly acquired competencies.

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SECTION 2: LITERATURE REVIEW

This chapter introduces the research problem, including the research area, the key concepts and illustrates how the design of the evaluation research that is to be detailed in Section 3, as well as the results that were reported in Section 1 were based upon the literature dealing with conducting a training needs analysis.

2.1. INTRODUCTION

Training is one of the key cornerstones within any going concern, and is a function that should be formulated in such a way as to facilitate learning at all possible levels. It is normally regarded as a planned short-term effort to modify competencies, attitudes, beliefs and knowledge through different learning experiences (Coetzee, Botha, Kiley and Truman, 2009). Training should also be structured in such a way in order to promote organisational performance and individual growth of all employees involved (Swanepoel, Erasmus and Schenk, 2008).

2.1.1. TRAINING OVERVIEW

Training (Coetzee *et al.*, 2009: 80; Erasmus *et al.*, 2007: 2) is the process used by organisations to change the KSAs of employees in order to achieve the set objectives.

2.1.1.1. Defining Education, Training and Development

Government agencies have realised that the management of human capital has become the focal point of organisations throughout the world (Gray, Hall, Miller and Shasky, 1997: 187). According to the research conducted by Cannon-Bowers and Salas (2001: 472) it was found that socio-cultural, technological, economic and political pressures all forced organisations to realise that training management underpins the success of any going concern (Holton, Bates and Naquin, 2000: 249). Swanepoel *et al.* (2008: 449) stated that a going concern has to review its objectives, study behavioural changes and continuously improve the standard of training. The South African Navy (SAN) has adopted this perspective in order to be a leading naval force (SA Navy, 2010a). From the United States perspective, Hayes (2008: 29) states, “the Navy’s paradigm of leadership cultivation must start at the beginning”, namely with the naval recruit. This approach by the United States corresponds with that of the SAN, and it is the naval recruit who is also the focus of this study.

Nel, Werner, Haasboek, Poisat, Sono and Schultz (2009: 445) define education as a type of activity that focuses on providing the knowledge, skills, moral values and understanding required by individuals in order for them to understand and interpret knowledge. Erasmus *et al.* (2007: 446) supports the above-mentioned definition in terms of education but includes the importance of the preparation of an employee “for a work that is very different from the one he or she currently holds”. The definition of training according to Amos *et al.* (2008: 324) describes it as “an attempt to alter or change the knowledge, skills and behaviour of employees in such a way that organisational objectives are achieved”. Swanepoel *et al.* (2008: 446) defines training in a similar way by stating that it is a learning experience, set within a certain period, with the intent of promoting performance improvement and/or personal development. Training according to Coetzee *et al.*, (2009) is a form of education, aimed at developing specific skills, in relation to specific tasks, which are often job-related. He therefore reconciles the views of Nel *et al.* (2009: 445) and that of Amos *et al.* (2008: 324) in order to bring education, job preparation and organisational alignment together. Development according to Nel *et al.* (2009: 16; Botha *et al.*, 2009: 49) is not set on the short to medium term, but refers to a long-term change effort. It is set on the “development possibilities within a job for a specific employee” that will affect the personal growth and goals that the individual has set for him or herself. It intends to “broaden individuals through exposing them to various circumstances and give them new insights about themselves and their organisations”.

Erasmus *et al.* (2007: 446) argues that the concept of training revolves around the improvement of employees’ skills, knowledge and attitudes. According to Amos *et al.* (2008: 324) training and development not only focuses on knowledge and skills but also on adjusting the behaviour of the individual in the organisation. Based on the definitions on education and training, the researcher considers education and training to be intrinsically linked to each other. The term development as stated by Erasmus *et al.* (2007: 447) encompasses a description that includes not only training but also education and any other type of learning process that will lead to a process of learning through growth. Guest (1986, cited in O’Driscoll and Taylor, 1992: 602) states that “learning and development are critical processes in all enterprises and

cannot be left to chance". The reality of increased pressure on governmental organisations to deliver an effective service, according to Gray *et al.* (1997: 187), necessitates successful training programmes with measurable results.

2.1.1.2. Effective Education, Training and Development

The National Skills Development Act (2010) supports the viewpoint that skills should be based on an understanding of the reasons behind tasks. It is for these reasons that training must interface with other training processes, and "environmental consciousness and commitment are important outcomes of environmental training, along with practical know-how". The competencies of an employee that consists of knowledge, skills and attitudes (KSA"s) clearly needs to be defined and documented in such a way that both the employer and the employee experiences positive benefits from the interaction. Competencies according to Botha *et al.* (2009: 49) refer to those behaviours or KSA"s that individuals demonstrate when engaged with a certain task. Knowledge is seen as a cognitive outcome of a learning programme. Knowledge therefore relates to the way in which people process information and attach sense and meaning to it (Botha *et al.*, 2009: 49; Erasmus *et al.*, 2007: 2). Skills on the other hand differs from knowledge in that it covers those aspects of behaviour that need to be executed to an acceptable level to ensure efficiency and effectiveness in the workplace. Landy and Conte (2004, cited in Botha *et al.*, 2009: 49) states that "shaping or changing attitudes and beliefs through training might involve raising awareness of prejudices to modify behaviour. Attitudes and beliefs are regarded as the affective outcomes of learning programmes". Training is therefore regarded as a planned short-term change effort to modify KSA"s as part of the competencies possessed by each learner through different learning experiences. It is also important to remember that when an employee commences a new appointment, the employee usually has already acquired a certain amount of KSA"s. These will most probably be because of previous education, or the influence of their social and cultural background and their personal experience in life (Kelly, 2010).

The Centre for Good Governance (2010) argues that training from a governmental point of view takes cognisance of the need to "develop competent and responsible

personnel in government departments in order to steer the tasks of nation building”. This should ultimately allow the employee to perform their duties to set standards and experience personal growth. It is however important to note that learning takes place in a different way for each learner and that various factors such as past experiences, cultural influences and perceptions affect the way in which learning takes place (Nel *et al.*, 2009: 445). Based on the definitions and interpretations of education, training and development, the SAN therefore needs to take cognisance by means of a training needs analysis, of the different cultural and educational backgrounds of the new recruits as a collective.

Thus, effective education, training and development based on Erasmus *et al.* (2007) and Amos *et al.* (2008) should ultimately allow the employee to perform his or her duties to set standards and simultaneously achieve personal growth through the type of learning process they were exposed to. It is however important to note that learning takes place in a different way for each learner and that various factors such as past experiences, cultural influences and perceptions affect the way in which learning takes place (Nel *et al.*, 2009: 445). Based on the definitions and interpretations of education, training and development, in order to be effective and efficient in its training, the SAN therefore needs to take cognisance of the variety of cultural and educational backgrounds of new recruit. The attitude and disposition towards marine pollution awareness training and the importance thereof, will vary considerably during the first period after recruitment due to the various different backgrounds of the recruits.

2.1.1.3. The Training Cycle

Training (Coetzee *et al.*, 2009: 80; Erasmus *et al.*, 2007: 2, Kelly, 2010) is a process, as depicted by Figure 1, that is used by an organisation to clarify its role, determine training needs, formulate the strategic aim/objectives of the training and through an integrated process decide on the content and methods of delivery to provide a programme that will change the KSA’s of employees and thereby achieve the set objectives and meet the training needs identified. To this end the expected competencies of learners are then evaluated in order to determine whether the

KSA's have been changed is better contributing to organisational objectives. Effective training therefore results from addressing needs, which are discrepancies between the way things are and the way things ought to be (Erasmus *et al.*, 2007: 125).

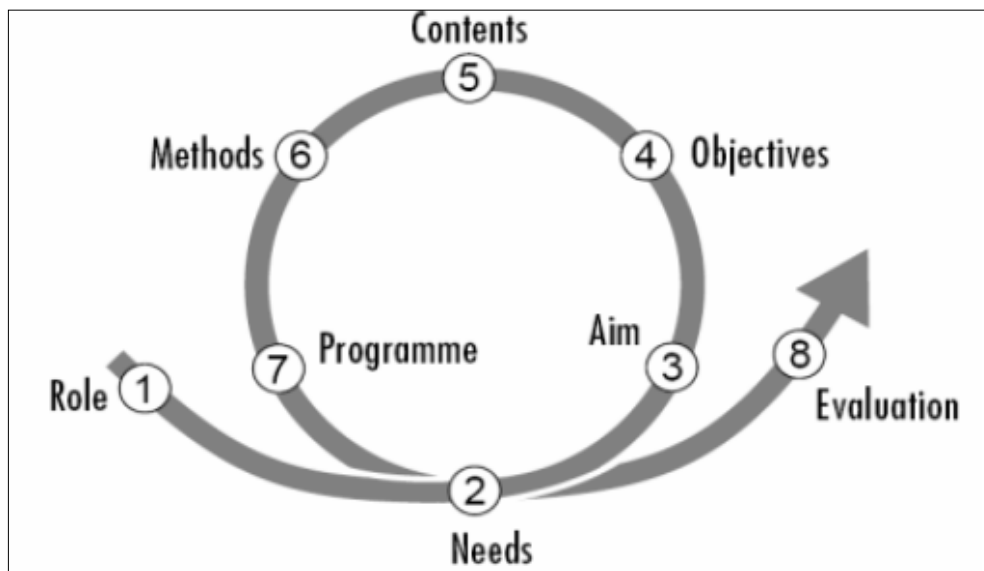


Figure 1: A Systematic Approach to Training.

Source: Kelly, 2010: 1.

The research conducted on training cycles by Hubr and Prokopenko (1989, cited in O'Driscoll and Taylor, 1992: 595) concluded that many organisations experience failure in terms of "attempting to change individual behaviour and improving organisational performance". This is due to poor TNA between the content of training and the job requirements of the individual.

2.1.1.4. Role of TNA in Training

Training results from identified needs, defined as discrepancies between the way things are and the way things ought to be (Erasmus *et al.*, 2007: 125). These discrepancies according to Coetzee *et al.* (2009: 105) can be resolved through a proper analysis of training needs that include a systematic process of planning the needs analysis, developing the data-gathering procedures and implementing the procedures, followed by analysing and planning the identified training interventions. In conclusion, evaluation of the interventions will take place and the relevant

stakeholders should receive feedback, which has the potential to increase the overall efficiency of the training environment (Coetzee *et al.*, 2009). The Centre for Good Governance (2010: 1) states that “a systematic and periodic review of present and future organisational needs connect training to the real world results and goals”. This statement reflects a commitment to designing, implementing and monitoring training needs analysis in government organisations. Patton and Pratt (2002) also support this approach and sentiment.

2.2. TRAINING NEEDS ANALYSIS

2.2.1. Aim of Conducting a Training Needs Analysis

According to both Nel *et al.* (2009: 459) and Swanepoel *et al.* (2008: 450) the main aim of conducting a training needs analysis is to identify performance requirements within an organisation, in order to channel resources into areas where the rendering of improved productivity or better quality services can take place. Research on TNA (Swanepoel *et al.*, 2008; Amos *et al.*, 2008) have found that few organisations realise the importance of assessing future training needs and therefore commit little time, funds and expertise when deciding to conduct a training needs analysis for current training requirements. This not only reduces motivation amongst employees to attend training programmes but also affects the overall effectiveness of the organisation.

2.2.2. Levels of Training Needs Analysis

The seminal contribution of McGehee and Thayer (1961, cited in O’Driscoll and Taylor, 1992: 594) to the literature on training needs analysis (TNA) states that the analysis of training needs is normally conducted on an organisational, operational and individual level (Swanepoel *et al.* 2008: 451). Van Dyk *et al.* (1992: 168) as well as Erasmus *et al.* (2007: 125) refer to these as “macro-, meso- and micro-level needs”. Cascio and Aguinis (2005, as cited in Swanepoel *et al.*, 2008: 449) combined the three levels into two, to propose an organisational and a task/job level. The three level conception of needs analysis of McGhee and Thayer (1961, cited in

Holton *et al.*, 2000: 250) “is still a core framework” within the field of TNA. Holton *et al.* (2000: 250) found that the previous terminology of “operations analysis” and “man analysis” have been replaced by “task analysis” and “individual analysis”. Kaufman, Rojas and Mayer (1993, cited in Holton *et al.*, 2000: 251) distinguished between a training needs assessment and a training needs analysis. According to Kaufman *et al.* (1993, cited in Holton *et al.*, 2000: 251) the difference between needs assessment and needs analysis is that the latter relates to the process used to analyze the causes of the gaps in training identified by needs analysis. It is however important to note that the researcher will focus his research exclusively on a TNA.

2.2.2.1. Macro Level

A macro level analysis considers the proposed training within the context of the greater organisation and whether or not the proposed training will be compatible with the organisation’s vision, mission, strategy and culture (Swanepoel *et al.*, 2008: 452). A TNA at organisational level is often referred to as a skills audit (Coetzee *et al.*, 2009: 87; Widgery, Stewart, Tubbs and Nicholson, 2004). The main objective of an organisational analysis is to examine the organisational objectives, the availability of resources, and where to implement the TNA results (Botha *et al.*, 2009: 87; Grau-Gumbau, Agut-Nieto, Liorens-Gumbau and Martinez-Maritinez, 2001: 235). Coetzee (2002) and Meyer *et al.* (2007, cited in Swanepoel *et al.*, 2008: 454) defines a skills audit as a process initiated to determine the actual skills of the current workforce in order to define the skills gaps and real skills requirements of the organisation. Key questions according to both Swanepoel *et al.* (2008) and Amos *et al.* (2008), which need to be answered in a skills audit, are:

- What are the knowledge and skills that the business will require to achieve its strategic goals?
- How much of this knowledge and skills does the organisation have in place?
- What are the key focus areas for training and development for the organisation?
- What will the result be if the training does not take place?
- Which departments should be trained first?

- Is the training consistent with the organisation's culture?

A skills audit requires an organisation to commit time, money and expertise and unfortunately, many organisations fail to make this preliminary investment prior to their undertaking into training Swanepoel *et al.* (2008: 454).

According to Katz and Kahn (1978, cited in Leat and Lovell, 1997: 148) organisational effectiveness can be expressed in the following terms:

- Goal achievement, measured in relation to product or service quality.
- Increased resourcefulness through increased employee versatility.
- Customer satisfaction, resulting from the minimisation of complaints and enhanced organisational image.
- Internal process improvements, resulting from high standards of supervision and the establishment of realistic and tangible departmental objectives.

The organisational analysis according to Katz and Kahn (1978, cited in Leat and Lovell, 1997: 149) should therefore explore such features as the goals of the organisation, skill resources, indices of effectiveness, and the organisational culture in order to ensure that the proposed training is aligned with organisational objectives agreed upon.

McGhee and Thayer (1961, cited in Grau-Gumbau *et al.*, 2002: 234) simplifies the organisational analysis or skills audit by referring to it as the determination of where and when the organisation has to implement training activities.

2.2.2.2. Meso Level

The main purpose of a TNA at job or meso level is to find out if a person's task is of importance to an organisation and whether training is to be executed (Nel *et al.*, 2009). During this process of conducting a task analysis, the content of a learning programme is also established (Coetzee *et al.*, 2009: 95). Task analysis also defined as job analysis by Grau-Gumbau *et al* (2002: 235) identifies the nature of the task

that must be executed and accomplished by means of pre-determined levels of knowledge, skills and attitude.

According to van Eerde, Tang and Talbot (2008: 65) the systematic approach to TNA must include as a minimum requirement the determination of the job requirements, the required skill levels and the current skill levels of the employees involved. Various case studies in this regards conducted by Taylor, O'Driscoll and Binning (1998, cited in van Eerde *et al.*, 2008: 65) support this statement. Swanepoel *et al.* (2008) is of the opinion that different techniques or methods can be used to conduct a task analysis, for example the critical incident method and the Delphi technique. Any one of these two or a combination thereof can be used. Once the tasks or duties have been identified, the detailed analysis of each task may commence. The accepted practise for identifying the appropriate people is to use subject-matter experts or high-performing experts. Examples of questions to be asked are the following (Swanepoel *et al.*, 2008: 452):

- How difficult is the task?
- Should it be part of the training curriculum or can it be learned on the job?
- What knowledge, skills and attitude are needed to do this task?
- What signals the need to perform this task?

2.2.2.3. Micro Level

On a micro level, individual analysis identifies the persons within an organisation that should receive training, the kind of training they need and what their current knowledge, skills and attitude are like (Coetzee *et al.*, 2009: 98 and Nel *et al.*, 2008: 460). The difference between actual performance and required performance will ultimately form the training gap (Nel *et al.*, 2008). Individual needs can be assessed using a variety of methods such as performance evaluation systems or from 360-degree feedback system. Coetzee *et al.* (2009: 98) states "...A 360-degree feedback system includes feedback from managers, peers and other stakeholders; and a self-evaluation". Objective data on incidents and written tests are used to assess employees' current job knowledge. According to Coetzee *et al.* (2009: 98), an added

consideration in the training needs analysis process is to assess the prior learning experience of employees.

Any task requires an employee to meet certain standards that may be in the form of levels of expertise, skills or performance. These standards may be based on regulatory frameworks, organisational policies or standards such those set by the South African Qualifications Authority (South African Qualification Authority, 2011a)

A widely acknowledged fact according to Tannenbaum and Yukl (2001, cited in Cannon-Bowers and Salas, 2001: 475) is that although TNA is critical as a training tool, empirical research on this human resources discipline has been very limited. The value of TNA has however, repeatedly proved to be an important process whereby the shortcomings in training can be assessed (Gray *et al.*, 1997; Holton *et al.*, 2000: 251).

Salas and Cannon-Bowers (2001, cited in Dierdorff and Surface, 2008: 29) states that “whereas most training researchers believe and espouse that training needs analysis is the most important phase in training, this phase remains largely an art rather than a science”. Considering the important role that TNA plays in the overall success of training and the vast of resources dedicated to it, the lack of empirically based research is potentially problematic to all stakeholders involved (Dierdorff and Surface, 2008: 29).

There seems to be interrelatedness in the multi-level TNA that reflects the following common elements:

- It focuses on the required performance of the organisation, the task and the individual being assessed.
- It determines the difference between the required and actual skill levels on all three tiers.
- It explores the causes for current discrepancies as well as the strategies to resolve it (Centre for Good Governance, 2010).

The TNA envisaged for this research will incorporate elements of all three levels. It must however be noted that due to the fact that the main emphasis of the research is on assessing the training needs in terms of KSA"s, the actual performance versus required performance within the micro level will not be assessed. Therefore, a complete TNA of the suggested MPTAP will not be possible due to the scope of the project (Holton *et al.*, 2000: 252).

In summary, the researcher intends to conduct an organisational analysis with the aim of examining the organisational objectives together with the available resources thereby deciding where to implement the TNA results. Thereafter the researcher will continue to focus on the meso or task level. The emphasis being on determining whether a person"s task is of importance to an organisation and whether training is to be executed. During this process, the content of a learning programme is established as well as the pre-determined levels of knowledge, skills and attitude. The last step of the TNA will focus on the micro level where the researcher will seek to identify the persons within the organisation that require training, the kind of training they need and what their current knowledge, skills and attitude are like.

2.2.3. Techniques of data gathering for TNA

According to Brown (2002), the different TNA data gathering techniques can affect both the kind and quality of information obtained in terms of the different advantages and disadvantages (See Table 7). For the purpose of this dissertation performance appraisal as a data gathering technique will not be used, as the concept of marine pollution awareness has not qualified in terms of the knowledge, skills or attitude that new recruits must possess in order to be appraised. It must also be stated that the SAN has not developed a system to conduct performance appraisal on marine pollution awareness training.

Gould, Kelly and White (2004: 35) are of the opinion that "methods of data collection must be rigorous yet practical". TNA is therefore a tool or process that is used to address a real problem that has a direct effect on the organisational performance, as well as the further development of the employees involved.

Table 2: TNA Data Collection Techniques (Brown, 2002: 575)

Advantages and Disadvantages of Needs Assessment Methods			
Method		Advantages	Disadvantages
Surveys/ Questionnaires	<p>May be in the form of surveys or polls of a random or stratified sample or an entire population.</p> <p>Can use a variety of question formats: Open-ended, projective, forced-choice, priority ranking.</p>	<p>Can reach a large number of people in a short time.</p> <p>Are inexpensive.</p> <p>Give opportunity of response without fear of embarrassment.</p> <p>Yield data easily summarized and reported.</p>	<p>Make little provision for free response.</p> <p>Require substantial time for development of effective survey or questionnaire.</p> <p>Do not effectively get at causes of problems or possible solutions.</p>
Interviews	<p>Can be formal or casual, structured or unstructured.</p> <p>May be used with a representative sample or whole group.</p> <p>Can be done in person, by phone, at the work site, or away from it.</p>	<p>Uncover attitudes, causes of problems, and possible solutions.</p> <p>Gather feedback; yield of data is rich.</p> <p>Allow for spontaneous feedback.</p>	<p>Are usually time-consuming.</p> <p>Can be difficult to analyze and quantify results.</p> <p>Need a skillful interviewer who can generate data without making interviewee self-conscious or suspicious.</p>
Performance Appraisals	<p>May be conducted informally or systematically.</p> <p>Conducted by manager; appraisal developed by HR.</p> <p>Should be conducted on a regular basis and separately from merit discussions.</p>	<p>Indicate strengths and weaknesses in skills, and identify training and development needs.</p> <p>Can also point out candidates for merit raises or promotions.</p>	<p>Can be costly to develop the system, implement the appraisals, and process the results.</p> <p>May enable managers to manipulate ratings to justify a pay raise.</p> <p>May invalidate the appraisal because of supervisor bias.</p> <p>May be prohibited for union employees.</p>
Observations	<p>Can be technical, functional, or behavioral.</p> <p>Can yield qualitative or quantitative feedback.</p> <p>May be unstructured.</p>	<p>Minimize interruption of routine work flow or group activity.</p> <p>Generate real-life data.</p>	<p>Requires a highly skilled observer with process and content knowledge.</p> <p>Allow data collection only in the work setting.</p> <p>May cause "spied on" feelings.</p>

There are several ways or techniques for conducting TNA's (Brown, 2002; Patton and Pratt, 2002: 468). It must however be noted that surveys are the most time consuming and tends to be subjective due to the clarification process after responses and the results according to Patton and Pratt (2002: 468) are often unclear. Observation as a technique of gathering data on micro level (Coetzee *et al.*, 2009: 80) does not interrupt the work of the person, but it could be seen as a form of spying. The observer must also have a good understanding of the work being observed. Observation also has the disadvantage that it requires skilled subject matter experts and can generate highly relevant information, but requires a lot of time and the observer need to be knowledgeable on both the process and the content of the work (Patton and Pratt, 2002).

Therefore, although there are various ways of obtaining data (Brown, 2002; Patton and Pratt, 2002, 468 Erasmus *et al.*, 2008) the following techniques are examples of what is considered effective:

- Questionnaires.
- Interviews.
- Document reviews.

The most effective method used to collect information from a large group of employees (Opperman and Meyer, 2008: 37; Erasmus *et al.*, 2007: 132) is questionnaires. Although interviews are a more "accepted and expected" method of collection within industry, it tends to be very time consuming and difficult to analyse and quantify (Erasmus *et al.*, 2008: 133).

For instance, a questionnaire may reflect strong biases if only a few of the participants return their survey and an interview can reflect the interviewer's biases. It is therefore considered best practise (Brown, 2002) to use a combination of methods in order to validate the data. It is however important to note that factors such as time, cost and reliability need to be considered when choosing a combination of methods. According to Anderson (1994: 25) general surveys of large populations are costly, time consuming and often without meaning, and therefore the

methodologies need to be carefully selected in order to collect data that is relevant to the TNA objectives.

Group discussions (Erasmus *et al.*, 2008: 134) if used in a structured manner are also a method of collecting data and together with interviews, can add value to the process of data gathering. While using records and reports as a method requires a skilled data analyst and emphasises historical events rather than current information, it can provide valuable information on lessons learnt and is not an invasive method (Erasmus *et al.*, 2007: 134).

Brown (2002) and Anderson (1994) maintains the point of view that at the data collection stage the questions will to some extent be guided by what is already known. However, each information source will bring a new perspective on the issues involved, which could be of importance for continued research on the same subject matter. Anderson (1994: 26) states that the “questions must be capable of generating data which, if not always statistically quantifiable, at least represents some sort of census view”.

Based upon the theory and the opinions expressed by different authors and researchers it is the opinion of the researcher that a combination of methods will be useful, including: face-to-face interviews, focus groups, documentary analysis and questionnaires.

2.3. TRAINING NEEDS ANALYSIS AND ITS APPLICATION IN THIS RESEARCH

The SAN focuses its training needs analysis on all three levels and consider both internal and external factors before deciding on what level a TNA will take place (South African Navy, 2010b). Furthermore, the limited training conducted specifically in a South African Naval context on marine pollution awareness training therefore necessitates the SAN to make use of this research to develop this competency base amongst naval recruits.

The researcher realised the potential value that this research could contribute to the SAN by way of the planned TNA and by proposing, in the form of other concomitant purposes of the research:

- Advice on the planning of a TNA within the SAN, and
- Advice on the various factors that will influence the introduction of a marine pollution training awareness programme into the curriculum of new recruits/ employees potential pitfalls.

2.4. CONCLUSION

As education, training and development are part of the key cornerstones within any organisation such as the SAN, and is regarded as a planned short-term effort to modify KSA"s through different learning experiences, it should be structured in such a way in order to promote organisational performance, job efficiency and individual growth of all employees involved.

It is also important to identify what are the shortages in existing training, at what level within the organisation does the training gap exist and what is the required training that should be presented to close the gap.

The necessity of conducting a TNA within an organisation such as the SAN will ensure that there is alignment between the core business objectives, the tasks that need to be executed and that personal growth and development of each employee is achieved. The method of data collection for the TNA however will be determined by the time available to conduct the TNA as well as the level of competency of the person conducting the TNA. TNA can thus be described as making sure that the right training is done to match organisational and stakeholder needs.

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SECTION 3: DESCRIPTION OF RESEARCH METHODOLOGY

This chapter describes the motivation for the research, research methodology, aim and objectives of the research, sources of data, data collection techniques, data analysis, research procedure, quality of research and the ethical considerations of conducting the research.

3. RESEARCH METHODOLOGY

3.1. Introduction

This chapter describes the research design that has been decided upon to achieve the research aim. A description of the research aim and objectives is followed by a discussion thereof. The researcher decided to employ Evaluation Research as the preferred research method (Babbie, 2008: 384), as the research consisted of an analysis of the training needs (Babbie, 2008: 383; Mouton, 2001: 158) of new recruits at SAS SALDANHA Naval Gymnasium. The researcher will adopt a postpositivist paradigm (Guba and Lincoln, 1994: 110) and try to assume an objective stance in the research.

Data collection techniques and the subsequent methods of data analysis will also be addressed. Thereafter issues of quality, ethics and the potential research limitations will be discussed.

After giving consideration to the relevant literature and organisational information (in this case the SA Navy), the researcher realised the potential value that this research could contribute to the development of marine pollution training awareness in the SAN. More specifically, the research could give advice on:

- the required competencies expected from a naval recruit in terms of marine pollution awareness in the SAN, and
- how to prioritise the knowledge, skills and attitudes expected from the new recruits that could be developed through the introduction of a marine pollution training awareness programme.

Data was collected through interviews and a document analysis of sources relating to training, training needs analysis, marine related regulatory frameworks, SAN policy/records and incidents of marine pollution in the SAN.

3.2. Aim of the Research

The aim of this research is to assess the training needs of naval recruits in terms of marine pollution awareness. A combination of the macro, meso and micro levels of TNA will be assessed. It is the expectation of the researcher that the identified training needs should assist in the future design of a curriculum to be delivered as part of the naval recruits' basic training programme. The delivery of this programme would in all probability be phased into the SAN, with the new recruits being the focus of the initial phase. This research should not only have an impact on the KSA's of the new recruits, but also on the operational effectiveness and efficiency of the SAN in terms of its strategic intent of "being unchallenged at sea".

3.2.1. Objectives of the Research

There are two objectives in this research.

Objective 1: To identify the required competencies expected from a naval recruit in terms of marine pollution awareness. This will be influenced by the following factors:

- Basic legislative requirements applicable on a MPATP as provided for by national legislation and international conventions and treaties.
- The SAN education, training and development policy requirements.
- The Sector Education Training Authority Unit Standards on marine pollution training.

Objective 2: To prioritise these knowledge, skills and attitudes.

3.3. Research Approach and Method

In conducting a training needs analysis of the training needs of the new recruits at SAS SALDANHA Naval Gymnasium, the researcher is effectively making use of Evaluation Research as the preferred research method. The critical realist assumptions underlying the nature of the training needs being evaluated suggests

that the researcher should adopt a postpositivist paradigm (Guba and Lincoln, 1994: 110) and try to assume an objective stance in the research.

According to Babbie (2008) and Mouton (2001: 158), evaluation research refers “to a research purpose rather than a specific research method. The purpose is to evaluate the impact of social interventions”. Evaluation research or outcome assessment can also be defined as a “form of applied research – that is, it is intended to have some real-world effect” (Babbie, 2008: 385). It could be described as a process of assessing whether a social intervention has reached the intended result. This type of research may vary from monitoring studies, cost-benefit studies to needs analysis studies. The latter study, being needs analysis study proved to be appropriate due its process of determining the “existence and extent of problems, typically among a segment of a population” (Babbie, 2008). The researcher, having dealt with marine pollution management as a senior naval officer, decided to first focus on the data that did not require the involvement of the new recruits. Thereafter the researcher engaged the new recruits through focus group interviews.

During the first phase of the data gathering process, the data were derived from sources such as current national and international regulatory frameworks, SAN ETD policies, the MSDS BMT curriculum and the relevant SETA Unit Standards. The results of the TNA however were split into the following three categories and are directly linked with the research objectives:

- The knowledge training needs and whether there is a gap between what they already know, what they should know and what they actually do know as new recruits.
- The skills gap that exists in terms of their ability to take control of situations where they are confronted with marine pollution related scenarios.
- The attitudes of the new recruits relating to their disposition towards marine pollution.

The findings therefore focussed on evaluating the marine pollution awareness competencies that recruits at SAS SALDANHA should possess.

3.4. Research Process

From the onset of the research, the target population for the TNA was already identified and consisted of the new recruits at SAS SALDANHA. This was done intentionally in order to keep the research topic focussed. From the perspective of initiating a new training intervention, it also makes sense to start with those employees at the beginning of their careers. The researcher made the decision to first allow the recruits to complete their initial training programme before they were interviewed by means of focus groups, so that they could comment on marine pollution with both the naval context and the course (to which marine pollution would be added), in mind.

It was decided to first establish the regulatory framework that governs the topic of marine pollution before any other research took place. This allowed the researcher to have a better understanding of the various laws and regulatory prerequisites that are aimed at preventing marine pollution. The Internet proved to be an extensive source of the legal information that was required. In addition, personal interviews were held with an internationally renowned legal subject matter expert at the University of Cape Town as well as with a researcher at the Council for Scientific Industrial Research in Stellenbosch who also has extensive experience in marine pollution research.

The next step involved obtaining data from the SAN in the form of questionnaires that was distributed personally as well as via e-mail to SAN human resource practitioners, SAN environmental specialists and SAN training personnel at SAS SALDANHA. The researcher also had easy access to relevant documents such as the Basic Military Training curriculum, the incident register pertaining to environmental contingencies as well as the SAN Environmental Policy.

The data required on existing SETA Unit Standards were obtained via the Internet. The data proved sufficient in terms of the Unit Standards that were required and the detail description regarding the required KSA"s expected from learners at National Qualification Framework Level 4.

Based on the regulatory information sourced from subject matter experts by means of interviews and reports detailing the amount of incidents where pollutants were spilled it was established that the SAN indeed require some level of marine pollution awareness training within the SAN.

The last step in gathering data was obtained from the recruits, who consisted of 25 out of a group of 50 members. A list of open ended questions were posed to them, which related to their understanding (knowledge), abilities (skills) and disposition (attitude) towards marine pollution and how they see the importance thereof in the SAN. Based on the prerequisites of the BMT recruiting and selection process, the researcher was aware that the majority of the population and sample would consist of Africans that originate from all over South Africa, but mainly rural areas away from the coast and would not necessarily have a lot of exposure to the marine environment.

The researcher analysed the relevant data gathered from interviews, questionnaires, Unit Standards, SAN registers and SAN MSDS BMT curriculum by means of an inductive approach in order to establish data driven codes (Boyatzis, 1998). This was done in order to determine whether certain themes are evident, that would help in identifying the relevant KSA"s applicable to a MPTAP. The interviews with the subject matter experts gave the researcher a deeper understanding of the subject matter. This allowed a comparison between the data detailed in the BMT curriculum, the facts stated by the subject matter experts as well as the standards stipulated by the SETA.

Based on the analysis, the relevant KSA"s were identified and prioritised in order to suggest the type of competencies that are expected from new recruits when introducing marine pollution awareness training.

3.5. Data Collection Techniques

Mouton (2001) refers to a data collection method as a process of applying the measurement instrument onto the population that is being evaluated. This process

as referred to by Mouton is also supported by Opperman and Meyer (2008) as well as Erasmus *et al.* (2007). Data collection techniques include documentation; archival records; interviews; direct observation; participant observation and physical artefacts. The quality and meaningfulness of gathered data can only be permitted as part of research if it is based on the following prerequisites, or "quality" indicators namely: reliability and validity (Reige, 2003). Babbie and Mouton (2001:122) also states, validity can be defined as "the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration". The researcher therefore in his research ensured that there was confirmation of the data gathered, by including questionnaires and interviews (Yin, 1994).

3.5.1. Interviews

The use of interviews in conducting the needs analysis is strongly encouraged (Mouton, 2001; Babbie, 2008). Individual interviews are a versatile and popular way to gather information amongst managers, because they can contribute their own views to the information obtained (Brown, 2002; Coetzee *et al.*, 2009). Spradley (1979, as cited in Kvale, 1996: 125) postulates that an open approach to learning from the interviewee is suggested if the interviewer want to understand the world from the viewpoint of the interviewee. Respondents can therefore elaborate on their views in their own terms and may develop better insights into their own situations (Brown, 2002; Coetzee *et al.*, 2009: 103; Kvale, 1996). According to Stake (1995) questions should not simply produce "yes" or "no" results but descriptive responses. Open-ended questions promote freedom of expression and allow the researcher to engage interviewees to derive unambiguous answers (Cohen *et al.*, 2000: 275). Interviews were casual and semi-structured in order to allow the respondents the freedom to express their feelings and allow them to elaborate on the open-ended questions posed to them (Brown, 2002; Coetzee *et al.*, 2009: 103; Kvale, 1996: 124). The interviewer attempted to establish an atmosphere in which the respondent feels safe enough to talk freely about their experiences, expectations and feelings. This involved a delicate balance between cognitive knowledge seeking and the ethical aspects of emotional human interaction (Kvale, 1996: 125).

The sampling procedure focussing on the internal respondents of the SAN consisted of new recruits (that forms part of the 2010/2011 intake and have just completed their basic military training at SAS SALDANHA), senior training staff of SAS SALDANHA, SAN environmental staff advisors and ETD subject matter experts. It was important for the researcher to establish whether the categories of knowledge, skills and attitudes as specified in the first objective, became visible through the transcripts and the other types of sourced data. These categories would represent the themes that would ultimately help to develop codes within the research.

The sampling procedure that focussed on respondents external to the SAN included legal subject matter experts from the University of the Cape Town. The type of data that was gathered from interviewees, concentrated on the educated opinions of legal experts, perceptions/expectations and conclusions of new recruits, past experiences of environmental staff advisors and staff input from ETD practitioners. The data gathered from the relevant subject matter experts allowed the researcher to gain a better understanding of the specific requirements and standards that affects the type of marine pollution awareness competencies expected from new recruits. The raw information that was gathered had to be reduced in order to identify themes that would be compared.

Accurate, legitimate and honest descriptions were generated by establishing a genuine rapport with the interviewee, and by gaining his/her trust (Babbie and Mouton, 2006). The researcher endeavoured to develop “thick and rich descriptions” of the topic being investigated (Remenyi, 1996). The researcher in this dissertation therefore made use of open-ended interview questions to gather “thick descriptions” of subject matter experts’ opinion on marine pollution awareness training. This allows the researcher to explore their responses in depth in order to support the inductive approach and help to develop codes. The researcher asked for clarification on comments and for examples of what they mean. In this way, the researcher obtained a full understanding of the concerns raised as well as the opinions and expectations expressed. Through interviews, the researcher built credibility with the interviewees by asking intelligent questions and listening carefully to their answers, obtaining employees’ personal involvement and commitment to the research efforts and

establishing personal relationships with potential trainees who are important to the success of the research.

Emphasis was placed on inductive analytical approaches during the analysis of the interview data (Babbie and Mouton, 2006). The researcher furthermore also decided to put the emphasis of the interview on exploration rather than hypothesis testing because the majority of the research lends itself towards an exploratory approach (Kvale, 1996).

The interviewer is knowledgeable on the topic of marine pollution and has extensive experience in the area. He was able to easily build rapport with the recruits through questions relating to their current knowledge, skills and attitude towards marine awareness training, importance of marine environment and their overall disposition towards the introduction of a MPATP into the BMT programme. He ensured the quality of the interview by communicating the purpose, outlining the procedure, summarising what was learned in the course of the interview and confirmed whether the interviewees had any questions concerning the subject matter (Kvale, 1996).

3.5.2. Questionnaires

Questionnaires (Appendix 8) are generally described as documents containing questions and statements designed to solicit information appropriate for analysis (Babbie, 2008: 272). It was the intent of the researcher to determine the general awareness of the respondents, especially new recruits and SAN staff of the research topic. The intent of the researcher was to distribute semi-structured, open-ended questionnaires to SAN subject matter experts, new recruits and maritime law experts on tertiary educational level. The researcher attempted to ensure that all items in questionnaires were clear and unambiguous. Open-ended questions that were posed, related to the required knowledge base, required skills and attitude. The questions that were asked attempted to create a better understanding of what the basic KSA"s should be to ensure that the possible training needs of the recruits are addressed.

To support the above-mentioned criteria the researcher will take on the role of “disinterested observer” and gain external input from subject matter experts that are not involved with the SAN in order to be as objective as possible (Guba and Lincoln, 2003: 114). Babbie (2001) defines “reliability” in the context of whether a specific technique, used repeatedly in the same research, would produce the same result each time, such as questionnaires.

3.5.3. Archival Records

Archived records pertaining to environmental incident reports and public complaints relating to marine pollution formed the basis for the study of archival records. Pollution incident reports for the period 2004 until 2010 was used to indicate the frequency and type of pollution within the SAN. These records form part of the environmental management system administrated by the SAN. The total amount of reported environmental incidents relating to pollutants being spilled was an indication of the severity and frequency of pollution incidents in the SAN. It indicated where the incidents occurred and the period involved. The results indicated the severity of spills taking place in the SAN, who are involved and what are the main causes for the occurrence of these spills. The results of the analysis were compared against the results received from the interviews and the questionnaires to see whether a theme became evident. It allowed the researcher to gain a better understanding of what the KSA priorities should consist of and what it should be based on. As it was previously stated, the results of the data gathered from the respective sources were compared in terms of themes that should shed more light on determining the KSA priorities.

3.5.4. Sector Specific Unit Standards

The researcher accessed the SETA website in order to identify Unit Standards that relate to marine pollution awareness training. It was the intention of the researcher to first determine if relevant SETA Unit Standards could be identified that were relevant to the research objectives being knowledge, skills and attitude. It was the expectation of the researcher that these Unit Standards should indicate the KSA’s expected from a new recruit/ employee. It was also important to see whether these

Unit Standards were on the same educational level for learners that have completed Grade 12 and that meet the requirements of the SAN ETD policy on the BMT curriculum. These Unit Standards could also act as a guideline against which a MPATP could be developed at a later stage (South African National Defence Force, 2009).

3.5.5. SAN ETD Policy

Current SAN ETD policy on the MSDS BMT curriculum directed the TNA process in terms of competency specifics and whether any consideration have been given to marine pollution awareness training. It was decided to refer to any MPATP considerations in the findings and recommendations of this dissertation in order to suggest more integrated TNA in future. The researcher attempted to determine if a TNA process exists in the SAN for the training of new recruits and if there are any policy prerequisites that will affect the process of assessing the MPATP training needs of new recruits.

3.6. Data Analysis

Babbie (2008: 415) states that qualitative data analysis refers to the “non-numerical examination and interpretation of observations, for the purpose of discovering underlying meanings and patterns of relationships”. Qualitative research is directly linked to the ability of the researcher to be conversant with the theory behind the research topic as well as the theory that pertains to qualitative research itself. If the analysis conducted by the researcher is not linked to theory, then the results may be questioned.

According to McClelland (1993), specific attention should be given to avoid prejudging the results of the research until all the data have been collected. This is important because throughout the research certain patterns will begin to show that will inevitably influence the researchers’ viewpoint and objectivity (McClelland, 1993: 18). Gaskell (2000) furthermore argues that the purpose of qualitative research is to

explore the different opinions of the research topic and that it is not about counting the opinions, but rather experiencing the different views of the related topic.

The researcher realised that an inductive approach towards developing a data driven code had to be followed due to the vast amount of raw data that need to be gathered. It was also evident that themes had to be identified amongst the different sources. These themes then had to be compared with each other in order to create a code. The reliability of the code was determined by the judgement received from the respective coders.

The analytic strategy that the researcher used was that of describing the data collected through a system of coding (Boyatzis, 1998). The researcher categorised the gathered data under three headings, which are also part of the objectives of this research. The researcher attempted to identify recurring patterns or themes between the categories and the respondents and information sourced from archival records. This type of analysis according to Strauss (1988: 20) that is referred to as coding corresponds with that of Boyatzis (1998). Due to the nature of evaluation research however, the analysis was qualitative. As the researcher conducted qualitative field research, it was important for him to remain aware of the various roles that he played. Researchers may be researching as participants within a particular phenomenon, but other times researchers are simply external observers (Babbie, 2008).

During the analysis of the data, it was necessary to look for themes in the data. This enabled the researcher to first group, and then code the respective themes that occurred in the transcripts of the interviews as well as other sourced data (Boyatzis, 1998; Babbie, 2008). The steps involved in this approach were a) generating a code, b) reviewing and revising the code, and c) determining the validity of the coder and code (Boyatzis, 1998). The generation of the code refers to collecting and grouping certain themes within the data and assigning a specific code to similar themes. This will allow thematic identification of the data. As soon as the themes have been identified, they were assessed by using the interviews and integrating them within

the theory from the literature review. The codes that were generated then had to be reviewed and revised before being used as themes based on the data.

The codes and themes that originated from the analysis of the data (i.e. the legal framework, the feedback from subject matter experts, the standards set by the SETA and other types of regulatory frameworks) allowed the researcher to determine what the specific KSA"s were and the priority that should be given to each in order to group them into themes.

3.7. Research Ethics

The researcher ensured that ethical aspects of the research such as informed consent were addressed by informing the respondents on all matters that might affect their honest and unbiased response (Babbie, 2008).

According to Denzin and Lincoln (2000) there are specific guidelines for ensuring ethical conduct during the research process, namely informed consent, no deception, assurance of privacy and confidentiality, and accuracy. The researcher received consent from the SAN to conduct the research from Directorate Fleet Human Resources.

The meetings and interaction with stakeholders and role-players was conducted with honesty and integrity by informing them of the background and reasons for the research, what the set research objectives are, and thereby eliminating any form of deception.

The researcher ensured that specific attention was given to the accuracy of the data collected, referred to; analysed and interpreted. This was done through careful capturing of the data, and with the authority granted by each research participant on completion of the interview transcript or questionnaire.

The military environment, in which this research took place, necessitated sensitivity towards the confidentiality of information in general and recognised that certain

confidential information was made available to the researcher. The researcher therefore took due care, by gaining approval from each interviewee to include information that is not public yet and made sure that integrity is exercised with the data and insights gained.

3.8. Research Limitations

The researcher has been employed for 20 years in the Department of Defence of which the last nine years have been with the SAN. This might affect the judgement and the disposition towards the critical needs of the SAN and therefore influence the required unbiased approach to the research. The researcher also realised that the biggest constraint affecting the research was time, due to the limited availability of the recruits whilst under military training. The researcher has no intention to introduce this programme into the current curriculum. The researcher also has no intention to address curriculum design, curriculum implementation, monitoring or evaluation as part of the immediate research. The results of the research will however be used by Directorate Fleet Human Resources when implementing a MPATP at SAS SALDANHA.

3.9. Conclusion

This section described the research aim and the research objectives. It was followed by a discussion of the research method and of the research design. Data collection techniques were discussed in terms of a brief definition, the type of data gathered, how the collected data were analysed, how it supports the research objectives and how issues such as quality, validity, dependability, credibility and ethics were ensured.

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APPENDIX 1

SOUTH AFRICAN QUALIFICATIONS AUTHORITY
Manage pollution and pollution control

PURPOSE OF THE UNIT STANDARD
A qualifying learner assessed as competent against this unit standard will be able to assess a pollution incident and assist in implementing a plan to control and prevent further environmental damage. This competence will contribute to a clean, healthy and safe environment. Achieving this competence will enhance the qualifying learner's employability and serve as a basis for further learning.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING
<input type="checkbox"/> Communication NQF Level 2 <input type="checkbox"/> Mathematics NQF Level 2

UNIT STANDARD RANGE

The following statements provide a general guide to the scope and complexity of the competence expected of a competent qualifying learner. These are provided in the modifiers under each specific outcome.

UNIT STANDARD OUTCOME HEADER
Identify the type and degree of pollution.

Specific Outcomes and Assessment Criteria:

SPECIFIC OUTCOME 1
Identify the type and degree of pollution, and the resulting problems.
OUTCOME RANGE
For example / Range: <input type="checkbox"/> Hazardous chemical spills, solid waste, in soil water or air, potential threat to humans and wildlife.
ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1
Identify the type and degree of pollution, and the resulting problems.
ASSESSMENT CRITERION RANGE
For example / Range: <input type="checkbox"/> Hazardous chemical spills, solid waste, in soil water or air, potential threat to humans and wildlife.

SPECIFIC OUTCOME 2
Network and liase with the responsible environmental pollution experts and with

communities where necessary.
OUTCOME RANGE
For example / Range: <input type="checkbox"/> Contact responsible authorities such as government departments and parastatals, communities likely to be affected.
ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1
Network and liase with the responsible environmental pollution experts and with communities where necessary.
ASSESSMENT CRITERION RANGE
For example / Range: <input type="checkbox"/> Contact responsible authorities such as government departments and parastatals, communities likely to be affected.

SPECIFIC OUTCOME 3
Propose corrective measures for some pollution situations.
OUTCOME RANGE
For example / Range: <input type="checkbox"/> Use alkalis to neutralise acids, prevent further pollution through correct clean-up methods.
ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1
Propose corrective measures for some pollution situations.
ASSESSMENT CRITERION RANGE
For example / Range: <input type="checkbox"/> Use alkalis to neutralise acids, prevent further pollution through correct clean-up methods.

SPECIFIC OUTCOME 4
Undertake follow-up assessment and monitoring procedures at the conclusion of the project.
OUTCOME RANGE
For example / Range: <input type="checkbox"/> Collect soil, water or air samples and facilitate analysis.
ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1
Undertake follow-up assessment and monitoring procedures at the conclusion of the project.

ASSESSMENT CRITERION RANGE

For example / Range:

- | |
|--|
| <input type="checkbox"/> Collect soil, water or air samples and facilitate analysis. |
|--|

UNIT STANDARD ACCREDITATION AND MODERATION OPTIONS

- | |
|---|
| <p>1. Anyone assessing a qualifying learner against this unit standard must be registered as an assessor with the relevant ETQA.</p> <p>2. Any institution offering learning that will enable achievement of this unit standard or will assess this unit standard must be accredited as a provider with the ETQA.</p> <p>3. Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant qualification and the agreed ETQA procedures.</p> |
|---|

<p>Therefore anyone wishing to be assessed against this unit standard may apply to be assessed by any assessment agency, assessor or provider institution which is accredited by the relevant ETQA.</p>

UNIT STANDARD ESSENTIAL EMBEDDED KNOWLEDGE

The qualifying learner is able to demonstrate knowledge and understanding of:

- | |
|---|
| <ul style="list-style-type: none"><input type="checkbox"/> Whom to contact for particular types of pollution events.<input type="checkbox"/> Local areas.<input type="checkbox"/> Pollution and its effects on local communities and ecosystems.<input type="checkbox"/> Basic waste management.<input type="checkbox"/> Best practice with respect to waste management.<input type="checkbox"/> Identifying types of pollution.<input type="checkbox"/> Basic local climatological knowledge.<input type="checkbox"/> Construction of dumps.<input type="checkbox"/> Construction of sewerage treatment facilities (e.g. pit latrines).<input type="checkbox"/> Recycling.<input type="checkbox"/> Alternative waste disposal technologies.<input type="checkbox"/> Waste- Animal interactions (problems and solutions).<input type="checkbox"/> Water reclamation and recycling.<input type="checkbox"/> Educational programmes. |
|---|

APPENDIX 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

REGISTERED UNIT STANDARD:

Explain pollution control and safe working practices - SAQA US ID 243999

PURPOSE OF THE UNIT STANDARD

The person credited with this unit standard is able to describe the precautions to be followed in order to prevent pollution to the marine environment. They are also able to apply safe working practices to ensure their own and others' safety as well as respond to emergencies.

The qualifying learner is capable of:

- Explaining the precautions required to prevent pollution to the Marine Environment.
- Explaining the Code of Safe Working Practises for Fishermen.
- Describing safety precautions on board ship.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING

Learners accessing this unit standard will be assumed competent in:

- Communication at NQF Level 2 or equivalent.
- Mathematical Literacy at NQF Level 2 or equivalent.
- SAMSA's Pre-sea Familiarisation Course or equivalent.

UNIT STANDARD RANGE

The following scope and context applies to the whole unit standard:

- This unit standard involves the skills and knowledge required to deal with personnel management and ship business relating to pollution and safe working practices on vessels of more than 25 gross ton.
- This unit standard refers to SAMSA's Code for SA Maritime Qualifications; Study matrices and syllabuses for fishing and marine motorman qualifications or equivalent, Personnel Management, Module 1 and any amendments.
- Work must be carried out in accordance with the maritime regulations.
- Vessel may include any commercial vessel engaged port operations activities, near coastal voyages and operating in limited and unlimited waters.
- This unit standard refers to the Merchant Shipping (Training and Certification) (Fishing and Marine Motorman Qualifications) Regulations, 2006 and any amendments thereafter.
- The marine environment refers to the environment not on board the vessel.
- Can demonstrate competence by oral examination and assessment of evidence obtained from one or more of the following:

Approved in-service training.
Approved training ship.
Approved simulator training.

Specific Outcomes and Assessment Criteria:

SPECIFIC OUTCOME 1

Explain the precautions required to prevent pollution to the marine environment.

OUTCOME RANGE

Pollution regulations include but are not limited to what to do in an emergency involving an oil spill on deck or in the engine-room, preventing oils spills, the throw plastics overboard and special areas (for the trade in which his/her ship is engaged) where certain pollutants may or may not be discharged overboard.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

An oil spill is reported to a ship's officer according to shipboard requirements.

ASSESSMENT CRITERION 2

Equipment to control an oil spill or pollution incident is selected in term of the pollution incident.

ASSESSMENT CRITERION 3

The containment of an oil spill/pollution is described in accordance with organisational procedures, techniques and equipment.

ASSESSMENT CRITERION 4

Organisational procedures designed to safeguard the marine environment are explained with examples.

SPECIFIC OUTCOME 2

Explain the Code of Safe Working Practice for Fishermen (COSWPFF).

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The location and requirements of the "Code of Safe Working Practises for Fishermen" is described in the context of the workplace.

ASSESSMENT CRITERION 2

The use of the "Code of Safe Working Practices for Fishermen" is explained with examples.

ASSESSMENT CRITERION 3

Consequences of not following the "Code of Safe Working Practices for Fishermen" are explained with examples of the implications for crew and the ship.

SPECIFIC OUTCOME 3

Describe safety precautions on board ship.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The need for safe working practices to be observed is explained with examples.

ASSESSMENT CRITERION 2

The role and responsibilities of the Safety Officer is described in accordance with legislative requirements.

ASSESSMENT CRITERION 3

Safety and protective devices available to protect against possible hazards are pointed out and their function explained.

ASSESSMENT CRITERION 4

Precautions to take before entering enclosed spaces are explained in terms of ensuring personal safety.

UNIT STANDARD ACCREDITATION AND MODERATION OPTIONS

- An individual wishing to be assessed (including through RPL) against this unit standard may apply to an assessment agency, assessor or provider institution accredited by the relevant ETQA.
- Anyone assessing a learner against this unit standard must be registered as an assessor with the relevant ETQA.
- Any institution offering learning that will enable achievement of this unit standard or assessing this unit standard must be accredited as a provider with the relevant ETQA.
- Moderation of assessment will be conducted by the relevant ETQA at its discretion.

UNIT STANDARD ESSENTIAL EMBEDDED KNOWLEDGE

- The competences required to deal with personnel management and ship business relating to pollution and safe working practices on vessels of more than 25 gross ton as indicated in the related current SAMSA legislation.
- Knowledge underpinning this unit standard includes relevant sections of associated legislation.
- General maritime proactive safety awareness relative to fellow mariners, vessels and environment.
- An awareness of one's situation at all times utilizing all one's senses.

APPENDIX 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Ensure compliance with pollution prevention measures – SAQA US ID 376262

PURPOSE OF THE UNIT STANDARD

This unit standard will be useful for people who have completed warship safety management and bridge watch-keeping within a naval context, as well as warship operations management, and wish to progress to positions of command in a maritime surface warfare environment. This standard will give them the opportunity to develop and balance their practical skills with the essential knowledge needed to earn a formal qualification in Warship Command and Control.

More specifically, this unit standard will recognise the knowledge of pollution prevention required as part of the competence for Warship Command.

People credited with this unit standard are able to:

- Maintain compliance with legislative requirements for protection of the marine environment.
- Implement antipollution procedures.
- Maintain documentation related to legislative requirements for the protection of the environment.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING

It is assumed that learners are competent in:

- Watchkeeping.
- Warfare operations management skills and knowledge.
- Surface warfare command in the SAN.

UNIT STANDARD RANGE

Specific range statements are provided in the body of the unit standard where they apply to particular specific outcomes or assessment criteria.

The following scope and context applies to the whole unit standard:

- Ensure compliance with international and South African legislative requirements and measures to ensure the protection of the marine environment.
- Consistent with Sections A II/2 and AIII/1 of the STCW 95 Code.

Specific Outcomes and Assessment Criteria:

SPECIFIC OUTCOME 1

Maintain compliance with legislative requirements for protection of the marine environment.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1
Relevant regulations and procedures for the protection of the marine environment are identified.
ASSESSMENT CRITERION RANGE
Procedures and regulations include: <input type="checkbox"/> International agreements; SAN regulations.

ASSESSMENT CRITERION 2
Appropriate action is taken in day-to-day work to ensure compliance with relevant regulations and procedures for the protection of the marine environment, as required by SAN regulations.

ASSESSMENT CRITERION 3
Appropriate action is taken where incidences of non-compliance or potential non-compliance are identified in accordance with regulations and SAN procedures.

ASSESSMENT CRITERION 4
Any breach of regulations and procedures concerning protection of the marine environment is rectified and/or reported as required within the scope of own responsibility, according to SAN procedures.

SPECIFIC OUTCOME 2
Implement antipollution procedures.

ASSESSMENT CRITERION 1
Anti-pollution procedures applicable to vessel operations are followed in the course of day-to-day work.

ASSESSMENT CRITERION 2
Items and equipment identified as high risk with respect to pollution are monitored according to a set schedule, as per SAN procedures.
ASSESSMENT CRITERION RANGE
Items and equipment include: <input type="checkbox"/> Pumps; valves; emission control equipment; water management equipment (cooling water, ballast water and bilge systems); waste storage and recycling equipment.

ASSESSMENT CRITERION 3
Appropriate preventative measures are implemented to prevent pollution of the marine environment in accordance with regulations and procedures.
ASSESSMENT CRITERION RANGE
Preventative measures include:

Prevention of spillages of fuel and oil; control of polluting emissions of gas and smoke; effective management of waste, pollution and recycling processes; shipboard housekeeping; pollution control instructions.

SPECIFIC OUTCOME 3

Maintain documentation related to legislative requirements for the protection of the environment.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

SAN requirements for reports and other documentation related to the protection of the marine environment and any breaches of relevant regulations are identified and accurately interpreted.

ASSESSMENT CRITERION 2

All required documentation related to the protection of the marine environment and any breaches of environmental regulations is completed in accordance with regulations and SAN procedures.

ASSESSMENT CRITERION 3

Information gathered on pollution and its prevention is collated, and areas for improvement in approach and execution identified are constructive and consistent with the intentions of the legislation.

ASSESSMENT CRITERION 4

Recommendations are forwarded to the SAN commanding authority.

ASSESSMENT CRITERION 5

Information relating to pollution and its prevention is disseminated via approved channels to assist with refinement of equipment, responses and procedures.

UNIT STANDARD ACCREDITATION AND MODERATION OPTIONS

- Anyone assessing a learner or moderating the assessment of a learner against this unit standard must be registered as an assessor with the relevant ETQA.
- Any institution offering learning that will enable the achievement of this unit standard must be accredited as a provider with the relevant ETQA.
- Assessment and moderation of assessment will be overseen by the relevant ETQA according to the ETQA's policies and guidelines for assessment and moderation.
- Moderation must include both internal and external moderation of assessments at exit points of the qualification, unless ETQA policies are specified otherwise. Moderation should also encompass achievement of the competence described both in individual Unit Standards as well as the integrated competence described in the qualification.

UNIT STANDARD ESSENTIAL EMBEDDED KNOWLEDGE

Embedded knowledge includes:

- IMO Performance Standards.
- SOLAS Convention, as amended.
- STCW Convention, as amended.
- Merchant Shipping Notices.
- Marine Radar Performance Specifications.
- Automatic Radar Plotting Aids Performance Specifications.
- Reports of Courts of Marine Enquiry relevant to safe navigation.
- Marine Accident Investigation Bureau reports relevant to safe navigation.

APPENDIX 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Demonstrate knowledge of compliance with pollution prevention requirements – SAQA US ID 261000

PURPOSE OF THE UNIT STANDARD

This unit standard is intended for learners within the Maritime Sector who work/wish to work as an officer on the bridge of a ship. This Unit Standard meets the needs of the sub-field and of the society by providing competent maritime officers who contribute to a safer environment on the ship and at sea. The learner successfully completing this Unit Standard will gain essential knowledge and practical skills to manage compliance with current maritime legislation, codes and practices, pollution prevention policies and procedures.

The competencies achieved by the learner in this Unit Standard will, in the case of the Merchant Navy and the Fishing Industry, contribute to the economic upliftment of the country, and in the case of the South African Navy, contribute the preservation of human life and the defence of South African warships, territorial waters and/or area of responsibility, thus providing a safer and secure society for South African citizens.

Learners credited with this unit standard will be able to:

- Describe precautions to take in order to prevent pollution.
- Demonstrate an understanding of a response to a pollution incident.
- Implement pollution prevention measures during fuel oil or liquid cargo transfer operations.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING
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It is assumed that the learner has the following knowledge and skills:

- Communication at NQF Level 4.

UNIT STANDARD RANGE

N/A

<u>Specific Outcomes and Assessment Criteria:</u>
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SPECIFIC OUTCOME 1

Describe precautions to take in order to prevent pollution.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

A description is given of the disposal of shipboard waste in accordance with navy and/or maritime, environmental and industry regulations.

ASSESSMENT CRITERION RANGE

- Regulations include the International Convention for the Prevention of Pollution from Ships and port and company procedures.
- Shipboard waste includes solid waste, oil, fuel, sewage, exhaust gas and contaminated water.

ASSESSMENT CRITERION 2

A description is given of procedures employed for basic environmental protection in terms of the International Convention for the Prevention of Pollution from Ships and zones for the disposal of shipboard waste.

ASSESSMENT CRITERION 3

A description is given of precautions necessary to avoid oil pollution during fuel transfer operations.

ASSESSMENT CRITERION 4

A description is given of overboard discharge and monitoring procedures with reference to a vessel's international oil pollution prevention certificate.

ASSESSMENT CRITERION 5

Records showing the correct method and location for the disposal of oil residues and garbage are maintained according to regulation requirements.

ASSESSMENT CRITERION RANGE

Records include but not limited to Ship Oil Pollution Emergency Plan, Oil Record Book entries and Shipboard Garbage Management Plan.

ASSESSMENT CRITERION 6

Records are maintained which show the method and location for the disposal of oil residues.

ASSESSMENT CRITERION 7

A description is given of the ship's ballast water management plan with reference to implications for pollution.

SPECIFIC OUTCOME 2

Demonstrate an understanding of a response to a pollution incident.

ASSESSMENT CRITERIA**ASSESSMENT CRITERION 1**

Incidents of waste spillage entering waterways are reported in accordance with operating procedures and local authority requirements.

ASSESSMENT CRITERION 2

A description is given of the immediate actions required to contain and neutralize waste spillage in accordance with the vessel's safety and environmental protection policy and procedures.

ASSESSMENT CRITERION 3

A description is given of containment methods for an oil spill in terms of the required responses, procedures, techniques and equipment required as per the Ship Oil Pollution Emergency Plan.

SPECIFIC OUTCOME 3

Implement pollution prevention measures during fuel oil or liquid cargo transfer operations.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

Air and water pollution prevention procedures are carried out in accordance with vessel practice and regulatory requirements.

ASSESSMENT CRITERION RANGE

Prevention methods include swinging of valves, taking soundings or ullages, correct preparation procedures and closed loading or discharging.

ASSESSMENT CRITERION 2

Spill containment equipment is checked to be available as required.

ASSESSMENT CRITERION 3

All relevant information with respect to malfunctions which may pose the risk of a pollution incident is reported to appropriate authorities as per standing orders.

UNIT STANDARD ACCREDITATION AND MODERATION OPTIONS

- An individual wishing to be assessed (including through RPL) against this Unit Standard may apply to an assessment agency, assessor or provider institution accredited by the relevant ETQA, or an ETQA that has a Memorandum of Understanding with the relevant ETQA.
- Anyone assessing a learner against this Unit Standard must be registered as an assessor with the relevant ETQA or with an ETQA that has a Memorandum of Understanding with the relevant ETQA.
- Any institution offering learning that will enable achievement of this Unit Standard or assessing this Unit Standard must be accredited as a provider with the relevant ETQA or with an ETQA that has a Memorandum of Understanding with the relevant ETQA.
- Moderation of assessment will be conducted by the relevant ETQA at its discretion.

UNIT STANDARD ESSENTIAL EMBEDDED KNOWLEDGE

- Communication NQF Level 2
- Mathematics NQF Level 2

Appendix 5

MODULE OUTCOMES, SUBJECT OUTCOMES AND SPECIFIC OUTCOMES

9. Module A: General Military Aspects. After the successful completion of this module the learner will be able to adhere to typical organisational procedures and system.

- a. Subject 1: Military Law. After the successful completion of this subject the learner will be able to conduct him/herself as a soldier, within the context of the SANDF Military Disciplinary Code. *Constitution of Botswana*
- b. Subject 2: LOAC. After the successful completion of this subject the learner will have a basic understanding of the LOAC according to SANDF doctrine.
- c. Subject 3: Life Skills. After the successful completion of this subject the learner would have been introduced to basic life skills required in the SANDF.
- d. Subject 4: Chaplains Orientation. After successful completion of this subject the learner would have been introduced to Chaplain Services in the unit.
- e. Subject 5: Personnel Induction. After the successful completion of this subject the learner would have
- f. Subject 6: Equal Opportunities. After the successful completion of this subject the learner would have been introduced to Equal Opportunities in the SANDF.
- g. Subject 7: Civic Education. After the successful completion of this the learner will understand the basic concepts of civil education and its influence on the soldier. *sustainability*
- h. Subject 8: Military Security. After the successful completion of this subject the learner will be able to conduct his/herself as a soldier consciously applying military security measures according to SANDF doctrine.
- i. Subject 9: Labour Relations: Show awareness of Labour Relations in the SANDF.
- j. Subject 10: Soldiering. After the successful completion of this subject the learner would have been introduced to a Soldier way of life in the SANDF.
- k. Subject 11: Hygiene. After the successful completion of this subject the learner will be able to apply the principles of Personal Hygiene in the SANDF and their personal life.
- l. Subject 12: Mess Etiquette. After the successful completion of this subject the learner will be able to apply all the correct mess procedures when

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attending a meal or function.

- m. Subject 13: Affirmative action. After the successful completion of this subject the learner will be introduced to Affirmative Action Policies in the DOD and the SANDF.
 - n. Subject 14: Basic Safety Rules. Apply the correct OHS regulations in the work environment.
9. Module B: Ceremonial Drill. After the successful completion of this module the learner will be able to demonstrate the required military bearing through the correct application of drill procedures.
 10. Module C: Musketry Training. After the successful completion of this module the learner will be able to prepare, maintain and competently shoot a rifle.
 11. Module D: Field Craft. After the successful completion of this module the learner will be able to apply the basic field craft skills in order to ensure initial survival on the battlefield.
 12. Module E: Map Reading and Navigation. After the successful completion of this module the learner will be able to read a map for navigational purposes and do elementary navigation with and without instruments.
 13. Module F: Buddy Aid. After the successful completion of this module the learner will be able to apply basic first aid until qualified medical help arrives.
 14. Module G: Physical Training. After the successful completion of this module the learner will have reached he/she required level of fitness to pass a standard SANDF fitness test.

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Appendix 7

15. Module H: Regimental aspects. After the successful completion of this module the learner will be able to adhere to the rules, practices and procedures related to regimental aspects according to SANDF prescripts.
- a. Subject 1: Dress Regulations. After the successful completion of the subject the learner will be able to dress according to the method prescribed in the dress regulations policy.
 - b. Subject 2: Guards and Sentries. After the successful completion of this subject the learner will be able to execute all the responsibilities of a sentry as part of a unit guard.
 - c. Subject 3: Compliments and Saluting. After the successful completion of this subject the learner will be able to apply the appropriate compliments and saluting towards members with different ranks within all the services of the SANDF.
 - d. Subject 4: Radio and Voice Procedure. After the successful completion of this subject the learner will be able to apply the correct radio and voice procedure when using a military radio.
 - e. Subject 5: Fighting and Fire. After the successful completion of this subject the learner will be able to prevent and fight fires as part of a unit fire piquet.
 - f. Subject 6: Regimental Duties. After the successful completion of this subject the learner will be able to execute regimental duties within a unit.
 - g. Subject 7: Military Customs, Traditions and Ceremonial Aspects. After the successful completion of this subject the learner will be able to apply SANDF military customs, traditions and ceremonial aspects.
16. Module I: CBR Defence. After successful completion of this module the learner will be able to successfully employ basic CBR defensive measures on individual level according to the SANDF Doctrine.
17. Module J: Combat Water Safety. After successful completion of this module the learner will be water safe according to the SANDF prescripts.
18. Module K: Comprehensive Field exercise. See Part 3 for detail of specific outcomes.

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Appendix 8

QUESTIONS TO MSDS'S

1. How important in your opinion is marine pollution awareness training to new recruits in the SA Navy?
2. In your opinion do you think that marine pollution awareness training will have a positive impact on the environment?
3. Do you think that new recruits who enroll in the MSDS Programme is aware of what maritime legislation entails?
4. Do you consider maritime legislation to be an important aspect of marine pollution awareness training?
5. Do you think that marine pollution awareness training will influence your behaviour towards marine pollution and the prevention thereof?
6. In your opinion do you think that marine pollution awareness training will have a sustainable effect on the next generation?
7. In your opinion how important would marine pollution awareness training be as part of all promotional learning opportunities in the SA Navy?
8. In your opinion do you think you are sensitised enough towards the prevention of marine pollution as part of your school education?
9. In your opinion do you think that the oceans are an economic resource worth protecting?
10. Do you think that the theory on marine ecosystems in Grade 12 were sufficient in order to allow you to make informed decisions during your career in the navy?
11. Are you aware of the current maritime legislation within the South African context?

12. Are you aware of the state of marine pollution taking place in the South African maritime environment?

13. Are you aware of what impact marine pollution will have on marine ecosystems and on the use of generations to come?

14. What would your suggestion be in terms of factors that need to be considered for a MPATP?

Table 4

ENVIRONMENTAL INCIDENT REGISTER

S/no	Reported by	Date of report	Date of incident	Description of incident	Follow-up procedure	Remark
1	CAPT DEENK	14/05/03	14/05/03	OIL SPILLED ON SUPWAY AT DIVING CENTRE	CLEARED AND DRUM GOT REMOVED	
2	W/O H. OLIVER	16/05/03	16/05/03			
2	W/O H. OLIVER	16/05/03	16/05/03	TERMINATION OF CONTRACT FOR REMOVAL OF DOMESTIC AND GARDEN REFUGE FROM H/MASTER	REPORTED TO BASE MANAGER	
3	N. Neil ^{Singh} Affair	25/06/03	24/06/03	NOISE IN WEST x EAST YARD	Meeting with Mr. Singh on 27/06/03 at his place	
4	MR B. TRAVISA	25/06/03	24/06/03	OIL SPILL: CAR DICK SALMON AND JIMMY GREEN RD DECKARD	REPORTED TO BERTH	
5	PO T. MEDGARS	4/09/03	4/09/03	OIL SPILL AT T-BERTH	INFORMED OPS/AREDEPT.	
6	PO T. MEDGARS	12/09/03	12/09/03	SEAL CARCASS AT T-BERTH	INFORMED H-MASTER	
7	NOI LEE	20/10/03	20/10/03	RUSTY WATER FLOWING TO SEA	REPORTED TO FACILITIES	
8	PO T. MEDGARS	30/10/03	20/10/03	OIL FLOATING AT T-BERTH	REPORTED TO OPS-ROOM FOLLOWED UP AT 11/06/04	
9	LT G. KWIK	06/11/03		DIESEL SPILL AT NSA WING/E FUEL POINT	REPORTED TO FIRE DEPT.	
10	W/O ZONJAN	16/03/04	16/03/04	DOG'S BONE W/HEAD AT 2-MJ. BANGAL AREA DISTURBING ISLAND BUSTLE CULTURAL	LT/CDR KWIK & CPO ENHANCED INVESTIGATION FOR FURTHER	
11	MR MATHAN	03/05/04	01/04/05/04	4x4 VEHICLE DRIVING ILLEGALLY ON FOOT BRIDGE ABOVE INT. C.O. SCHOOL	LT/CDR KWIK & W/O ENHANCED INVESTIGATION CLASH AT THE BRIDGE WITH A NAWA PPD-LOCK	
12	CPO HENKMAN	17 MAY 04	17 MAY 04	OIL (DIESEL) SPILL IN GEN. ROOM (H/MO)		

Table 5

ENVIRONMENTAL INCIDENT REGISTER

S/no	Reported by	Date of report	Date of incident	Description of incident	Follow-up procedure	Remark
13	LT CDR KUMAR	7/06/04	UNKNOWN	OIL LEAKING OUT OF DRUMS	REPORTED TO ROLE PLAYERS	
14	WO2 BAILEY	7/6/04	"	OIL SPILL ON WATER	" " "	
15	LS CLOUS	10/06/04	"	OIL DRUMS NOT REMOVED		
16	LS CLOUS	10/06/04	10.06.04	GARBAGE FLOATING ON WATER		
17	FIRE DEPT	10/06/04	10.06.04	ATT/BERTH AND INCL RASH		
17	FIRE DEPT	10/06/04	10/06/04	SPILL AT L X M BERTH	CONTACTED CONTRACTORS	CLEARED 9/11/04
18	CAPT N. MARAIS	01/07/04	UNKNOWN	SPILL AT FUEL PALM	CONTRACTORS TO GIVE QUOTES	
19	WOICLIPTON	07/07/04	07.07.04	DIESEL LEAKAGE ENGINE ROOM		
20	MR MARTIN	19/08/04	18/08/04	OPS ROOM BUILDING PARAFFIN WATER MIXTURE SPILL AT CHEMICAL CLEANING BAY	SPILL CLEANED - CONTRACTOR WILL EMPTY CONTAINERS	
21	CDR VESTER	14/09/04	14/09/04	BAGGON IN RED AREA AT SANAD	BAGGON LEFT unit voluntarily.	
22	LT COL KUMAR	4/10/2004	4/10/2004	REMOVAL OF SUSTAINMENT	LETTER ENN/22	
23	PO PARIS	01/11/2004	01/11/2004	DEAD SEAL IN HARBOUR	SEAL REMOVED + BURIED	
24	FUELING PARTY	3/11/2004	3/11/2004	RUPTURED/LEAKING DIESEL PIPE	ALL PARTIES ACTIVATED	
25	WO WALTERS	18/04/05	18/04/05	SEWAGE PUMP BROKE DOWN WED 5PM	REPORTED TO ROLE PLAYERS	
26	WO WALTERS	02/02/06	02/02/06	SOIL DUMPED AT STABLES	ACTIVITY STOPPED	
27	WO WALTERS	02/02/06	02/02/06	SOIL DUMPED AT IPTOPOT	REP TO WO WILLER	
28	WO WALTERS	02/02/06	12/02 + 10/06	NOISE POLLUTION (HUIS)	ACTIVITY STOPPED LETTER TO AFFECTED PARTIES	LETTER SENT TO ALL PARTIES
29	OPS ROOM	24/02/06	24/02/06	DIESEL SPILL AT SILVERMINE	SPILL CLEANED + BOI 07/06 NBS CONVENED.	
30	OPS ROOM / MR. CAIG	04/04/06	03/04/06	EXCESSIVE NOISE HUIS BLDG	WO WALTERS/BOI WO WILLER TO TASK 5000 CONTACTED - NO NOISE	TO TASK 5000 HUIS TO CHECK
31	HARBOR MASTER	16/01/07	16/01/07	ROAD TREE BRANCH OVERHANGING ON ROAD	ENV SERVICES TASKED	
32	MR MITCHELL	16/01/07	16/01/07	INVASIVE INFESTATION	UNIT/ENV SERVICES TASKED.	
33	MR WEBB	17/01/07	17/01/07	BOUNDARY OVERGROWN WITH (GET JACKSON)	ENV SERV TASKED	COMPLETED 18/01/07

9/07

Table 6

ENVIRONMENTAL INCIDENT REGISTER

S/no	Reported by	Date of report	Date of incident	Description of incident	Follow-up procedure	Remark
04/07	OPS ROOM	22/01/07	22/01/07	TREE FALLEN OVER - SILVERMINE	TREE TO BE CUT UP	JOB COMPLETE - 23/01/07
05/07	ENV SERV	16/03/07	13/03/07	UNAUTHORIZED DUMPING BY CIVILIAN	MEMBER FINED 1000.00	
06/07	STAN MO	23/06/07	23/06/07	TREE FALLEN OVER - ENTRANCE S/MMA	INSTRUCTED TO CLEAR AREA	COMPLETE -
07/07	PT-4/DIDO (PETA)	26/06/07	26/06/07	FIRST CASTLE GRID	INFORM TUMP TO CLEAR	COMPLETE
07/07	PT-4/DIDO (PETA)	26/06/07	26/06/07	FUEL SPILL	NOTHING FOUND	
07/07	FIRO	23/06/07	23/06/07	BABCOENS IN 7 CABLE MILL	ERT REPORTED CAN REQUEST	
					OF EOT PRO AND	
					MAKE RESIDENTS	
					AWARE OF PREVENTATIVE	COMPLETE
					MEASURES	
08/07	NHAM	11/10/07	08/10/07	WASTE CAR TRUCK FUEL SPILL	CLEANUP	JOB COMPLETE
09/07	NHAM	09/10/07	29/10/07	FUEL SPILL PAPA WALL	IN PROCESS OF CLEANUP	DEL IT W02/07 CAPT X-MERSET
01/08	ELIM	01/04/08	01/04/08	Alleged water pollution	Reported to DEFL, FCC.	
					Signals released	
					prohibiting release of	Complete
					place water + flms	
					+ SOP distributed to flat	
02/08	OPS ROOM	23/06/08	23/06/08	FUEL SPILL IN PUMP HOUSE - FUEL PUMP	FUEL WAS AMPROBENT	COMPLETE
02/08	NHAM	28/10/08	28/10/08	OILY BILGE WATER SPILLED - PROVA	CLEANED BY NHAM	COMPLETE

