An analysis of the maritime pilot training and certification: a comparative study between Denmark and Namibia

Suoma Nangolo Kalulu

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AN ANALYSIS OF THE MARITIME PILOT TRAINING AND CERTIFICATION SYSTEM

A Comparative Study between Denmark and Namibia

By

SUOMA NANGOLO KALULU

Namibia

A dissertation submitted to the World Maritime University in partial Fulfilment of the requirements for the award of the degree of

MASTER OF SCIENCE

In

MARITIME AFFAIRS

(MARITIME EDUCATION AND TRAINING)

2018
DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

Signature:  
Date: 18 September 2018

Supervised by: Michael Ekow Manuel

Associate Professor (The Nippon Foundation Chair)
Head of Maritime Education and Training Specialization
Head of English and Study Skill Programme
Malmö, Sweden
ACKNOWLEDGMENTS

Great is your mercy towards me
Your love and kindness towards me
Your tender mercy, I see
Day after day

Forever faithfully towards me
And you’re always providing for me
Great is your mercy towards me
Great is your grace

“Donnie McClurkin”

Psalms 9:1-2, “I will praise you, LORD, with all my heart and tell about the wonders you have worked. God Most High, I will rejoice; I will celebrate and sing because of you”. Thank you almighty God for your mercy towards me, AMEN. I would not have made it, if it was not for the assistance and contribution of the following institutions and individuals to whom I am in debt to.

My sincere gratitude goes to the International Transport Federation (ITF), thank you for the financial assistance provided to me, without doubt the scholarship was an educational dream come true. To the Namibian Ports Authority (NAMPORT), thank you for the trust bestowed upon me and for giving me time off to pursue this academic dream. To the World Maritime University (WMU) and in particular the President, Professors, academic and residence staff, thank you for the life-long learning filled with rich experiences acquired during my studies and thank you for introducing me to an international family. I will sincerely treasure the lessons learnt and experiences gained throughout my time in Sweden. To my supervisor Professor Manuel, thank you for making this dissertation possible and for your guidance and engagement through the learning process. To Captain Lukas Kufuna, thank you for the assistance and
continuous encouragement. To all participants who took time off from their busy schedules, thank you for your participation and assistance.

To my caring husband Jerry Kalulu, thank you for your unconditional love, motivation and unwavering support. Thank you for assuming the role of both parents in my absence. Thank you for bringing up our children in the counsel of the Lord and for being central to their emotional wellbeing. To my sons Ably, Ian and Johannes Kalulu, thank you for your tolerance. My absence at home created a void that I can never repay.

To my parents Suoma Itope, Aina and Jeremia Kalulu, thank you for your understanding, motivation and prayers. To Linda Mateus, Gina Andre, Maria gaSalu and Maria Itana thank you all for taking turns to be a mother to my children. To all my loving relatives, friends and colleagues, thank you for your moral and emotional support and prayers.

May GOD Bless you all, AMEN.
ABSTRACT

Title of Dissertation: An analysis of the Maritime Pilot Training and Certification System: A Comparative Study between Denmark and Namibia

Degree: Masters of Science

The study compared and contrast the maritime pilot training and certification scheme of Namibia against that of Denmark and with international standards and best practices with the objective of determining the competencies required by pilots in order to provide safe and effective pilotage services at the port. It further examined how and where these competencies are acquired and established the training and educational duration required to attain these competencies. The study also sought to establish the minimum standards of pilots’ training and certification internationally and to determine the gaps between the Namibian practices against Denmark’s argued to be representative of best practice. The study was restricted to maritime pilots operating in a port setting and only dealt with training and certification matters. A qualitative research approach (specifically case study) was decided on. Document/material analysis and desktop research formed the greatest sources of data. Information was directly retrieved and extracted from key organisations’ sites and reference sources online. A critical literature review was done and included the examination of national regulations, procedures, guidelines, company data and reports. Several interviews were held to seek clarification on specific matters.

The study findings showed differences in regulations, procedures, structures, operation and administration and well as in education and training systems in the two pilotage jurisdictions. The findings further indicate a need to have universal standards of maritime training and certification that will stimulate the development of critical competencies key to high performance and protection of the marine environment to promote safety of life and property at sea and in ports.

Keywords: Maritime pilots, training and certification system, competent pilotage authority, universal standards, competencies, safety, local area.
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<td>BRM</td>
<td>Bridge Resources Management</td>
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<tr>
<td>CBT</td>
<td>Competency Based Training</td>
</tr>
<tr>
<td>CPA</td>
<td>Competent Pilot Authority</td>
</tr>
<tr>
<td>DMA</td>
<td>Danish Maritime Authority</td>
</tr>
<tr>
<td>DPA</td>
<td>Danish Pilotage Authority</td>
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<td>EU</td>
<td>European Union</td>
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<td>IMO</td>
<td>International Maritime Organisation</td>
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<td>IMPA</td>
<td>International Maritime Pilots Association</td>
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<td>IWA2</td>
<td>Integrated Workshop Agreement 2</td>
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<tr>
<td>MET</td>
<td>Maritime Education and Training</td>
</tr>
<tr>
<td>METI</td>
<td>Maritime Education and Training Institution</td>
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<tr>
<td>MWT</td>
<td>Ministry of Works and Transport</td>
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<td>NAMPORT</td>
<td>Namibia Ports Authority</td>
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<td>NMA</td>
<td>National Maritime Administrations</td>
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<td>PC</td>
<td>Pilot Code (of NAMPORT)</td>
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<tr>
<td>PSC</td>
<td>Personal Safety Training</td>
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<tr>
<td>QM</td>
<td>Quality Management</td>
</tr>
<tr>
<td>QMS</td>
<td>Quality Management System</td>
</tr>
<tr>
<td>STCW</td>
<td>International Convention on Standards of Training, Certification and Watch keeping for seafarers</td>
</tr>
<tr>
<td>UDS</td>
<td>Danish Agency of Higher Education</td>
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<tr>
<td>UNCTAD</td>
<td>United Nations Conference on Trade and Development</td>
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CHAPTER 1 – INTRODUCTION

Estuary navigation, manoeuvring in confined waters, ports or canals demands great nautical skill. Merchant vessels with ever larger dimensions have to be safely guided through narrow waterways, often in heavy traffic. The pilot acts as the partner of the captain coping with this demanding role, which requires long experience as well as specific knowledge of the vessel and the estuary. Within a very short period of the time pilots have to acquaint themselves with the characteristics and manoeuvring of an unfamiliar vessel, while taking weather conditions, currents and tides into account, before setting course and giving instructions to sail (IMPA, 2004).

Many people watched ships moving in or out of ports with no idea that a local citizen (maritime pilot) is on the bridge of the ship assisting its navigation. A maritime pilot is a professionally licensed mariner who navigate all kinds of ships safely and expeditiously through domestic waterways while ensuring safety of the environment, people and trade. Pilots are highly trained experts in ship navigation in confined waters and possess highly specialised extensive knowledge of local conditions. Pilots provide pilotage service in accordance with port shipping requirements and Port Authority Act. They coordinate all arrangements relating to vessel arrivals, anchoring, berthing, unberthing, shifting ships, departures and are responsible for completing required pilotage documentations for charging (Bunbury Port Authority, 2011, p.2). A maritime pilot liaise with pilot boat crew to coordinate towage requirements and advise the hydrographic office regarding notice matters, navigational charts, navigation warning and hydrographic reports. According to (Kirchner, 2008), a pilot occupy one of the most important position in the maritime industry, yet remain the least-known. Pilots are an indispensable cogs in the transportation system of every maritime economy as their work prevent traffic congestion, accidents that could impair navigation in and out of ports, safety of lives, cargo,
cost and time expended in port calls, which are all factors used to measures the competitive attractiveness of ports (Kirchner, 2008, p.11).

1.1 Background to the study

NAMPORT is a state-owned enterprise established by an Act of Parliament (Namibian Ports Authority Act, 1994 (Act 2 of 1994) to “manage and exercise control over the operation of ports, lighthouses and other navigational aid in Namibia and its territorial waters and also to provide facilities and service normally related to the functioning of a port while conducting its business in accordance with sound and generally accepted business principles as outlined in section (2) of the Act” (Namibian Ports Authority Act, 1994, p.5). NAMPORT has power over the jurisdiction of the Port of Walvis Bay and Lüderitz. Section 23 of the Act declared the two ports of the authority compulsory pilotage ports with the following conditions:-

(a) Every ship entering, leaving or moving in such a port shall be navigated by a pilot who is an employee of the Authority, except ships that are exempted by statute or regulation or a permit issued by the Authority;

(b) It shall be the pilot’s function to navigate a ship in the port, to direct its movements to determine and control the movements of the tugs assisting the ships under pilotage.

(c) The pilot shall determine the number of tugs required for pilotage in consultation with the Port Captain, whose decision shall be final;

(d) A master shall at all times remain in command of his or her ships;

(e) Neither the master nor any person under his or her command may, while the ship is under pilotage, in any way interfere with the navigation or movement of this ship or prevent the pilot from carrying out his or her duties, but the master may intervene in the case of an emergency to preserve the safety of his or her ship, crew or cargo and may take whatever action he or she deems necessary to avert the danger;

(f) Where a master intervenes, he or she shall immediately inform the pilot thereof and, after having restored the situation, he or she shall permit the pilot to proceed with the execution of his or her duties;

(g) The master shall ensure that the officers and crew are at their posts, that a proper look-out is kept and that the pilot is rendered all assistance necessary in the execution of his or her duties;
(h) The Authority and the pilot shall be exempted from liability for loss or damage caused by a negligent act or omission on the part of the pilot, but not an act amounting to gross negligence; and

(i) For the purpose of subsection (1) “pilot” shall mean any person duly licensed by the Authority, or any other authority approved by the Authority, to act as a pilot at a particular port.

The Port Captain is responsible for the managing and control of the ports and is the final authority on matters relating to pilotage, marine safety, navigation, dredging and all other matters relating to the movement of ships within the area of the port (Namibian Ports Authority Act, 1994).

1.2 Problem statement

In fulfilling the obligations specified in section 1.2, NAMPORT have introduced a cadet training programme that sponsored young Namibians to take up deck and engineering training opportunity. The training programme was also introduced to address the employment imbalances of the past in the maritime sector. Throughout each financial year, NAMPORT apportioned 6% of its annual payroll to staff development of which the largest % of funds were used towards the cadet training programme. During 2016/2017 financial year N$ 8 million was allocated to maritime training for pilots, tug masters and engineers (Namibian Ports Authority, 2018). Contrary to these enormous investments, the cadet training program had only produced six qualified pilots in today with a breakdown of three pilots holding 3,000 – 5,000 GRT pilot license, one pilot holding 50,000 GRT pilot license and three pilots holding open pilot licenses since inception in 1998. The TROI is considered insignificant when comparing the resources spend and returns received. TROI does also not respond to current and future human and operational needs of the port. It is because of the aforesaid reasons that, NAMPORT had to review the current maritime training and certification scheme.

Further note that NAMPORT is the sole recruiter, trainer and employer of maritime pilots in Namibia and for this reason it might be difficult to separate NAMPORT from Namibia and vice versa when certain remarks are made in the study.
1.3 **Aim of the study**

The aim of the study is to compare and contrast the maritime training and certification system of Namibia against Denmark and with international standards and best practices. The study will examine how Denmark fulfil the research objectives identified in section 1.4 of the dissertation. The research finding will be used to make recommendations to Namibia on how to improve its current training and certification scheme.

1.4 **Objectives of the study**

(a) to determine the competencies required by pilots in order to provide safe and effective pilotage services at the port;
(b) to examine how and where these competencies are acquired and further establish the training and educational duration required to attain these competencies;
(c) to establish the minimum standards of pilot training and certification internally; and
(d) To determine the gaps between the Namibian practices against Denmark.

1.5 **Research questions**

(a) what competencies are required by pilots in order to provide safe and effective pilotage services at the port;
(b) how and where these competencies are acquired an establish the training and educational duration required to attain these competencies;
(c) what are the minimum standards of pilot training and certification internationally; and
(d) what are the gaps between the Namibian practices against Denmark.
1.6 **Significance of the study**

Namibia is a maritime nation. The study is important for Namibia because it will disclose Namibia’s strength and weakness in terms of the administration, management, regulation and control of maritime training and certification scheme and further indicate areas that might need improvement and redress to comply with international standards on pilots training and certification. The study will also identify the resources and structures necessary for an effective system. Since NAMPORT operates at an international level and constantly competes with ports around the globe, the study will provide NAMPORT with information that can be used to improve the provision and administration of maritime pilot training and certification in order to improve port performance and the protection of the marine environment which will promote safety of life and property at sea and in the port.

1.7 **Scope and limitation**

The study is restricted to pilots operating in ports setting and will only be dealing with training and certification matters. All other pilots are excluded from the study since they operate in different local areas and therefore their conditions and needs are different. The study will also disregard the operational procedures for maritime pilots other than deep-sea pilots and all none training and certification matters will be excluded from the study. A comparison will be made between Namibia’s and Denmark’s maritime pilot training and certification systems.

1.8 **Structure of the study**

The dissertation comprise of the (6) chapters. Chapter one introduce the study and covers the study background, problem statement, aims, and objectives formulated research questions and will elaborate why the study is significance. It also outline the study scope, limitations and structure. Chapter two summarise the sources consulted during literature review and discussed a number of issues relevant to the study such as educational psychology and sociology, history of pilotage, pilotage in modern shipping and international legislations governing maritime pilot training and certification. Chapter three describe the study design, sampling, data collection,
data analysis and ethical considerations. Chapter four discuss maritime pilot training and certification systems of both Denmark and Namibia with reference to existing rules and procedures, structures, training programs and syllabus. It will also look at bodies (structures) that are part of the systems. Chapter five analyse and summaries the study findings and respond to the research questions. Chapter six summarised the study findings and made recommendations to NAMPORT and Namibia on how to improve the maritime pilot training and certification system.
CHAPTER 2 - LITERATURE REVIEW

Literature review incorporated the study of relevant primary and secondary documents in print and electronic format obtained from WMU, IMO, NMA, PA, CPA, UN Agencies, METI and private institutions. It included the examination of applicable international conventions, national regulations, procedures, guidelines, company data and reports, minutes, conference proceedings, research reports, peer reviewed journal, port data, desktop research, online references and books. It also looked at earlier academic writings on maritime pilot training and certification. Although several studies addressing maritime pilotage and training were traced, none of these studies addressed a case study on the research topic.

2.1 Definitions

Table 1: Definitions

Source: Author, based on literature review

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<th>Area</th>
<th>Certificate of competence</th>
<th>Certificate of proficiency</th>
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<tr>
<td>Area</td>
<td>means the water for which the applicant is to be certified or licensed (IMO, 2003);</td>
<td>means a certificate issued and endorsed for masters, officer and GMDSS Radio operator in accordance to provisions of Chapter II, III, IV, or VII of the annexure and entitling the lawful holder therefore to serve in the capacity and perform the functions involved at the level of responsibility specified therein (IMO, 2017)</td>
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functions involved at the level of responsibility specified therein (IMO, 2017);

| Certificate/licence | means a valid documents, by whatever name it be stating the pilotage area for which it is issued and stating any requirements or local limitations that the competence pilotage authority may specify such as maximum size, draught or tonnage of vessel that the holder is qualified to pilot (IMO, 2004, p.3); |
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| **Pilotage area** | the geographical area in which a pilot is, according to his pilot certificate, authorised to carry out pilotage activities. |
| **Seagoing service** | means services on board a ship relevant to the issue or revalidation of a certificate or other qualification (IMO, 2017) |
| **Standards of competence** | means the level of proficiency to be achieved for the proper performance of function on board ship in accordance with internationally agreed criteria as set forth herein and incorporating prescribed standards or levels of knowledge, understanding and demonstrated skill (IMO, 2017) |
| **Training** | Means any teaching sequence arranged to provide the participant with knowledge, competencies and/or skills established by regulations, guidelines, description of objectives and goals laid down pursuant to the Act on maritime training programmes. Training shall cover both rather long teaching sequences and short courses, irrespective of whether they are carried out as basic, further or supplementary training (Danish Maritime Authority, 2009) |
2.2 Educational psychology and sociology

Educational psychology attempted to understand the process of human learning and development (across the life span). It focused on developing ways to improve the teaching and learning processes through theory and research involving content (findings) and process (critical thinking). Educational psychology is viewed as a behavioural science with required observable, measureable subject matter. Theorist studied psychology of education to justify teaching methodologies regarded appropriate to be used and to identify anticipated challenges in teaching. Sociology studied human social relationships and institutions and looked at learning as a skill of social interaction, and learning as a role in a specific society. Educational sociology studied the relationships between learning and variables such as family background, race, access to resources and social class, which are predominately outside the individual control. Learning theories (i.e. behaviourist, cognitivist, humanist and social and situational) were developed to provide a framework and to bridge research and education, however no theory superior to the other as learners are different and learn differently. Teachers should be aware of learning differences to ensure that each learning activity is meaningful for learner development and advancement. The curriculum should to enable learners to engage and develop their skills, knowledge and understanding in different ways. Teachers should take into account these complexities and try to design learning activities in a manner that creates internal harmony and educational adequacy. Kolb’s model identified four modes in the leaning cycle as illustrated in Figure 1. The model can help teachers to overcome the learning challenges explained.
2.2.1 Adult learning

Adult learning is seen as a complex phenomenon. Various assumptions were made by several theorist to explain these complexities. Malcolm Knowles developed a framework that distinguished adult learning (andragogy) from child learning (pedagogy). Although some critics have challenged andragogy because it focussed largely on the individual learner and does not directly address the social context in which learning took place, andragogy retained an important place because of the value it has. According to (Pappas, 2018), the first assumption of the theory was that adult’s learners have a well-established sense of self. In a
training context this meant that adults want to have a say or autonomy in their own learning and if not they might lose interest in the learning programme. Secondly, past experiences played a fundamental role in adult learning. Adults possess the world of experiences both socially and academically and to assure effective teaching one need to feed into what they already know. This is crucial, because if new data conflict existing knowledge base they will reject it. Teachers must be skilful to integrate their live experiences, actively thought the process. Thirdly because adult leaning is purpose driven and they see the relevance of it and if they are missing the training it should cost them non-compliance fine or a promotion. They consciously decide to pick up a new skill or polish a valued hobby therefore learning needs to be goal orientated. They have to see measurable learning objectives inducting the need to have a clear system of gauging their process. Otherwise they will walk out of the class. Fourthly because adult learners are driven by internal motivation and develop their own method of motivations. Fifthly because mistakes are often the most valuable teacher hence adults are encouraged to explore the subject matter first hand and learn from the mistakes. Lastly because adult learners play an active role in the learning course design process. They need to be empowered and motivated through various methods such as feedbacks, surveys and course evaluations.

2.2.2 Maritime training

Maritime trainings are provided by accredited METI. The trainings are CBT focussing on the acquisition of knowledge & skills (abilities) demonstrated through assessments. Competence are specific, purposeful, observable and/or measureable knowledge, skills, ability or behaviour that contributes to successful job performance. STCW’1978, as amended put a number of demands on METI’s. It obligate parties to ensure that all training and assessment of seafarer for certification under the convention are structured in accordance with written programmes, including methods and media of delivery and procedures. Course materials are necessary to achieve the prescribed standards of competence. The convention prescribe that trainings must be conducted, monitored, evaluated and supported by persons qualified as outlined in the convention (IMO, 2017). It further require that instructors, supervisors and assessors are appropriately qualified for the particular types and levels of training or assessment of competence of seafarers on board or ashore (IMO, 2017).
2.2.3 Quality management in education

Quality is defined as fitness for purpose. QM ensures that output, benefits and the process by which they are deliver meet customer requirements and is done through quality planning, assurance, control and continual improvement as illustrated in Figure 2. Regulation I/8, Quality Standards, required parties to ensure that “all training, assessment of competence, certification, including medical certification, endorsement and revalidation activities carried out by non-governmental agencies or entities under its authority are continuously monitored through QMS to ensure achievement of defined objective, including those concerning the qualification and experience of instructors and assessors; and where governmental agencies or entities perform such activities, there shall be a quality standard system” (IMO, 2017). QM was necessitate by the inconsistent manner in which the agreed standard for maritime training and certification were achieved through the maritime world. METI’s should have QMS which comprises of a formalised system that documents processes, procedures and responsibilities for achieving quality policies and objects which help coordinating and directing organisations activities for the purpose of meeting, regulatory requirements and improve its effectiveness and efficiency on a continuous basis (The Global Voice of Quality, 2018) as seen illustrated in Figure 3 that include the five key elements outlined in section B-I/8. To ensure this, maritime administration should ensure that section A-I/8 is implemented during independent evaluation of knowledge, understanding, skills and competence acquisition, assessment activities that the administration of certification systems (external audit) is conducted every 5 years and that it verifies the areas specify in Section A-I/8, sub section 3 (1) – (4). IWA2 provides QMS guidance to for the application of ISO 9001:2000 in education.
Figure 2: Scientific process improvement framework evaluation


Figure 3: Representation of the structure of the International Standard in the PDCA Cycle

2.3 Early history of pilotage

The earliest name by which pilots were know was *Lodesman*, or *Lotesman* in Germany, a terms which had the same root as Lodestone, a piece of magnetic ore which had the effect of turning in a north or south direction when suspended – used as a compass, or direction finder (Martin, 1977, p.14). The term pilot originated from a Dutch word *Pijl*, meaning anything vertically straight, and *Leod*, a lead which is sent down in a straight line to determine the depth of water at a given point (Martin, 1977, p.14). Another term used was *Hovellers*, which still applied to the men who board barges to work them under bridges (Martin, 1977, p.14). Ships nearing or leaving confined waters of a harbour were required to make use of the services of experienced men aware of the problems of navigation within their own locality. These arrangements goes as far back as the 1700 B.C. Hammurabi’s Babylonian Code of Laws which included statues relating to pilots fees and penalties for accident and the loss of ships (Martin, 1977, p.14). Traces of pilots were also discovered in the bible i.e. Ezekiel who is thought to have lived approximately six centuries’ before Christ, had the following to say: “Thy wise men, O Tyrus that were in thee were thy pilots. The suburbs shall shake at the sound of the cry of thy pilots, as all that handle the oar, the mariners and all the pilots of the sea, shall come down form their ships” (Martin, 1977, p.14). Another mention of pilots were originally included in the several maritime codes from the island of Rhodes (400 BC), Oleron (1199 AD) and Visby (16th Century) which produced maritime laws mostly covering the insurance aspects of maritime commerce (The Nautical Institute, 1990, p.16). While many travellers and explorers as seen in Figure 4, employed pilots.

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1 Book of Ezekiel in the bible, Chapter 27 verse 8, 28 and 29
After the recognition of the Trinity House by King Henry VIII, by-laws were passed giving the cooperation effective control of pilotage in the Thames. Ninety days later, James I granted Trinity House the compulsory pilotage and shipping and the exclusive right to licence pilots in the river. In 1561 an Act was passed giving the Corporation powers to erect “beacons, marks and sigh of the sea…whereby the danger may be avoided and escaped and ship the better come unto their port within peril” (Martin, 1977, p.18). In 1685, Samuel Pepys was appointed First Master. Two seaman organisation were granted charters by Henry VIII. Trinity House of Newcastle, formed in 1536 was given power to regulate pilotage in Tyne while Trinity House of Kingston-Upon-Hull, a Guild or Fraternity of Masters of Pilots, founded in 1369, was granted its charter in 1541. Pilotage on the Humber River has been in operation since 1512. In 1581, Queen Elizabeth Charter extended the Guilds power as a pilotage authority and later given the right to make a charge on cargo passing in and out of Hull by sea. The Act passed by Parliament in 1800 increased the powers of Trinity House, Kingston-Upon-Hull, who were appointed the pilotage authority whose duties was to examine and license pilots, fine unauthorised pilots, suspend and, where necessary, cancel pilots licences. The only exemption from compulsory pilotage where men of war, coasters and British vessels of less than six feet draught and vessels coming into the Humber for shelter. The Act also fixed pilotage rates and rates for British ships. Less than a month after the Act was passed, thirty mariners were granted licenses and such certificates, which contained the seal of Trinity House Corporation which they need to carry with them and show it to masters of the vessel on demand. Pilots of this time kept their self-employed status. The above history provide an overview of earlier pilotage and pilots and not...
much has change in terms of structures, systems and procedures. The general principles remains the same.

2.3.1 Early marine pilot training

Early pilot trainings were conducted through on-the-job training and concentrated on a pilot’s ability to handle ship up to a specified limit of length, draft, tonnage or combination thereof. It entailed specific pilots’ assignments consisting of a number of supervised manoeuvres – berthing, unberthing, mooring at buoys, getting underway from both channel passage and manoeuvres specific to that jurisdiction before being allowed to work alone (The Nautical Institute, 1997, p.243).

2.3.2 Pilotage in modern shipping

Trade route, navigational technology, ships size and specialisation had changed greatly over time (Pelletier & Aires, 2017, p.1). The need of having a pilot on board vessels transiting high-risk waters remains critical. Today’s pilots use the most sophisticated maritime technology in combination with their expert local knowledge. Technological advancement is happening at a fast pace, making it difficult for pilots to keep current with such high tech. New ship types demands new manoeuvring skills yet maritime pilots are required to manoeuvre them without prior experiences, exposing them and others to potential dangers. These changes demands specialised skills, constant vigilance, and decision-making of the most complex sort. Pilots must be familiar with every aspect of the pilotage district for which they are licenced and therefore must be able to recount under all weather and visibility condition – every channel twist, bridge, and navigational aid (Pelletier & Aires, 2017, p.1). They must understand the effects of tides, currents, winds, and the hydrodynamics of vessels moving through changing waterways. Today’s pilots provide one of the most important service available to the shipping industry and public (Pelletier & Aires, 2017, p.1).
2.3.3 Maritime pilots duties

Pilotage is not a business but safety regulation and pilot first responsibility is to protect the interest of government – and therefore, by definition, of the public – that issued the licence and regulates the pilot operations (Pelletier & Aires, 2017, p.1). In addition to navigation, maritime pilots according to the EU, are also responsible for:-

(a) Navigation control;
(b) Checking the status of the switching of each vessel;
(c) Reporting of shortcomings and deficiencies;
(d) Coordinates the towing and mooring services of the port;
(e) Reports any incidents detected in navigation in port waters to the maritime and port authority;
(f) Report any pollution sources found in port waters;
(g) Report on the failure or breakdown of beacon signals form the port and its vicinity;
(h) Communicates with authorities in case of maritime emergencies; and
(i) Participate in consultations, meetings and discussion with the maritime community.

IMO further required pilots to execute these duties with care and diligence in promotion of the desired goals.

2.3.4 Master and pilot relationship

Although captains are experts at navigating vessels, they are not experts on regulations and specific environments of ports hence they require local expertise of a maritime pilot to ensure that their vessel, crew, passengers and cargo arrive at their next port of call in a safe and efficient manner. The master and pilot relationship is based on trust, honesty and assurance. A pilot expect the master to be honest in describing the condition of the ship and problems it has while the master depends upon the pilot to describe the transit honestly in terms of foreseen problems, route, tugs, line handlers and shore facilities and to be knowledgeable of the local regulations. The pilot must assure the master that he/she is competent and capable of handling the ship which he/she can do to through pilot voyage planning, relevant port information and conference with the deck officer. Pilots should seek the master’s advice on any matters of concern with manoeuvres. IMO believes that pilots plays an important role in promoting maritime safety and protecting the marine environment and trust that maintaining of proper
A working relationship between the pilot, master and officer in charge of the navigation watch is important in ensuring the safety of shipping (Resolution A.960, 2003, p.1).

2.4 International legislations on maritime pilot training and certification

IMO promoted the adoption of several conventions, protocols, codes concerning the maritime safety, security, prevention of pollution and several recommendations dealing with a wide range of subjects. Recommendations are not binding on government but are important in providing guidance in framing national regulations and requirements. At present there is no convention that regulates the training and certification of pilots and each country retains the full competence on pilotage. IMO, has however regulated various aspects of the profession through a set of resolutions, conventions and recommendations related to the characteristics of the service to be provided, the safety connected to the service and the relationship between maritime pilots and master. International regulations governing pilotage and pilot training and certification of maritime pilots are illustrated in Figure 5.

![International Conventions](SOLAS_1974_Chapter_23V_and_STCW1978_as_amended)

- Resolution A.159 (ES.IV), Recommendation on Pilotage, 27 November 1968;
- Resolution A.1045 (27) Pilot transfer arrangements;
- MSC/Cir. 1156, 23rd May 2005, Guidance on the access of Public Authority;
- Emergency response service and pilot on board ships of which SOLAS Chapter XI-2 and ISPS code applies;
- Resolution A.601 (15), Provision and display of manoeuvring information on board ships;
- Resolution A.960 (23), Recommendation on training and certification and operational procedures for maritime pilot other than deep-sea pilots; and
- Resolution A.159 (ES.IV), Recommendation on Pilotage, 27 November 1968.

Figure 5: International regulations for pilotage and pilot training and certification

Source: Certipilot (EU, 2013. P.13)
2.4.1 STCW convention

STCW 1978, as amended establishes international standards of training, certification and watchkeeping for seafarers. STCW does not govern the training and certification of maritime pilots. The convention set standards for training, assessment and certification of Masters and Deck (Navigation) Officers. These are the standards use for the training of pilots by most countries and therefore appropriate for consideration.

2.4.2 IMO Resolution A.960 (23)

The IMO Resolution A.960 (23) set requirements around training and certification or licencing standards of pilots. IMO recognised the that some states had already established high standards of pilotage services and encouraged them to maintain those standards while urging others who did not to establish these standards to provide for effective co-ordination between pilots and ship personnel, taking due account of ship bridge procedures and ship equipment (Resolution A.960, 2003, p.1). The resolution also advised Governments to urgently give full effect to the he recommendation and to establish CPA to perform the function\(^2\) in Figure 6 and in partnership with national and local pilotage association.

\(^2\) Only function 3 – 7 in figure 6 should be performed in partnership with the national and local pilotage association
Figure 6: Duties of a competent pilotage authority and pilot association

Source: IMO Resolution A.960 (23), 2003

2.4.2.1 Pilotage certificates or licences

All pilots are required to hold appropriate pilotage certificate or licences issued by a competent pilotage authority. Competent pilotage authority should ensure that the certificate or licence issued are printed in English and meet the minimum design and content requirements set out in article 3 of the resolution and should state all the information illustrated in Figure 7.
2.4.2.2 Medical fitness

Section 4 of the Resolution required pilots applying for any certificate of competency to meet medical fitness standards (eyesight, hearing and physical fitness) required for the certification of masters and officers in charge of a navigational watch prescribed by Regulation I/9 of the STCW convention. Medical fitness standards should adhere to the minimum in-service standards set out in table A-I/9 and take into account the criteria for physical and medical fitness set out in paragraph 2, section B-I/9 and table B-1/9 (STCW, 2011, p.89). All medical certificates shall be valid for a period of two years unless the seafarer is under the age of 18, in which case the maximum period of validity shall be one year (STCW, 2011, p.29). Pilots who has experienced serious injury or illness are subject to re-evaluation of medical fitness before allowed to return to duty.

Source: Resolution A.960 (IMO, 2003, p.3) and Reprinted from The Pinsta, Retrieved 3 September 2018 from http://www.thepinsta.com/amp-gt-1_f1fK%7C48nISh0HrAhn5
2.4.2.3 Training standards

CPA should ensure that the established training and certification or licensing standards are sufficient to enable pilots carry out their pilotage duties safely and efficiently. The training standards required are set for initial training; continuing training and for updating and refresher training which all have distinct goals and learning outcomes. All pilots must be trained in BRM that emphasis the exchange of information essential to safe transit. The training standards stipulate the several training elements (Appendix A) for that must be included in the training. Initial trainings targeted to the develop the trainee pilot’s skills and knowledge as determined by CPA and should include practical experienced gained under close supervision of an experienced pilots is supplemented by simulation (both computer and manned model); classroom instruction or other training method (IMO, 2003). The development of the initial training is illustrated in Figure 8.

BRM training for pilots should emphasis training elements illustrated in Figure 9, while the master-pilot information exchange training should regulatory requirements governing exchange; recognition of language, cultural, psychological and physiological techniques for
overcoming these impediments; and best practices in the specific pilotage area (IMO, 2003, p.4).

Figure 9: Training elements for bridge resource management

Source: Resolution A.960 (IMO, 2003, p. 4)

Continued proficiency trainings strive to maintain and enhances knowledge, skills and experiences of pilot for effective and efficient pilotage duties while update and refresher trainings ensure the continuation of pilot’s proficiency and updating of their knowledge. These trainings may be done in the manner as illustrated in Figure 10.
2.4.2.4 **Pilotage certification or licensing**

Section 7, of the Resolution outlined certification or licensing syllabus. All applicants for a pilot certificate or license must demonstrate that they have the necessary knowledge of the areas as illustrated in table 2.

Table 2: Pilotage certification licensing

Source: Resolution A.960 (IMO, 2003, p. 7-8)
<table>
<thead>
<tr>
<th>Necessary knowledge to demonstrate Maritime Pilot Certification or Licensing</th>
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<tr>
<td>1. Limits of local pilotage areas;</td>
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<tr>
<td>2. International Regulations for Preventing Collisions at Seas, 1972 as amended, as also such other national and local navigation safety and pollution prevention rules as may apply in the area;</td>
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<td>3. System of buoyage in the area;</td>
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<td>4. Characteristics of the lights and their angles of visibility and the fog signals, racons and radio beacons and other electronic aids in use in the area;</td>
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<td>5. Names, position and characteristics of the light vessels, buoys, beacons, structures and other marks in the area;</td>
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<td>6. Names and characteristics of the channel, shoals, headlands and points in the area;</td>
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<td>7. Bridge and similar obstruction limitations including air draughts;</td>
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<td>8. Depths of water throughout the area, including tidal effects and similar factors;</td>
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<td>9. General set, rate, rise and duration of the tides and use of the tide tables and real-time and current data systems, if available, for the area;</td>
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<td>10. Proper courses and distance in the area;</td>
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<td>11. Anchoring in the area;</td>
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<tr>
<td>12. Ship handling for piloting, anchoring, berthing and unberthing, manoeuvring with and without tugs, and emergency situations</td>
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<td>13. Communications and availability of navigation information;</td>
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<tr>
<td>14. Systems of radio navigation warning broadcasts in the area and the type of information likely to be included;</td>
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<td>15. Traffic separation schemes, vessel traffic services and similar vessel management systems in the area;</td>
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<td>16. Bridge equipment and navigational aids;</td>
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<tr>
<td>17. Use of radar and other electronic devices; their limitation and capabilities as navigation and collision avoidance aids;</td>
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<tr>
<td>18. Manoeuvring behaviour of the types of ships expected to be piloted and the limitations imposed by particular propulsion and steering systems;</td>
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CHAPTER 3 - RESEARCH METHODOLOGY

3.1 Research design

A qualitative approach was adopted because it fit the purpose of the study and according to consulted literatures, qualitative research takes place in the natural setting; it uses multiple method that are interactive and humanistic; it is emergent rather than tightly prefigured; it is fundamentally interpretive and allows for the researcher to be interpretive; to view social phenomena holistically; to be introspective and to acknowledge biasness, values and interest; and to allow for the use of more strategies of inquiries as a guide for the procedures in the qualitative study (Greswell, 2003, p.181-182).

Since the research questions pursued to comprehend the maritime pilot training and certification systems of Denmark and Namibia in respect of “what competencies are required...”; “How and where .”; “what are the minimum...” and “what is …”- case study was viewed appropriate in providing in-depth description of the study (Yin, 2017, p.4). Thomas explained that a case study method is a research that concentrates on one thing, look at the one thing in detail and does not seek to generalise from it - he further explained that a case study is about a particular rather than the general and that a researcher cannot generalised from it (Thomas, 2011, p.3). A case study analyse persons, events, decisions, periods, projects, policies, institutions or other systems which are studies holistically by one or more methods and that the subject of the inquiry will be an instance of a class of phenomena that provides an analytical frame – an object – whining which the study is conducted and which the case illuminates and explicates (Thomas, 2011, p.23). The case study research provides for the answering of the “how” & “why” type of questions; does not require control over behavioural events but focus on contemporary events (Yin, 2018, p.9). According to Yin, the demands of a case study on the researchers intellect, ego and emotions are far greater than those of any other research method because the data collection procedures are not routinized (2018, p.82).
Because of this the study formulated good questions and interpreted the answers fairly by continually reviewing the evidence without taking it for granted; by attempting to understand the intend of the documents and messages between the lines and remained adaptive and adopting and maintained an unbiased perspective and acknowledged situation in which the study may have inadvertently begun to pursue a totally new study (Yin, 2018, p.85). Additional methods used during the study included interviews and content analysis because of the value it added to the study. Interviews were used because it allowed for more detailed questions to be asked and for the clarification to be obtained when and where it was required while content analysis allowed for the systematic analysis of the data collected.

3.2 Sampling

A non-probability sampling technique using convenience and purposive sampling was used because of the research study limitation. The selection of the sample population was guided by two distinct criteria. The first criterion was to select a sample population that possessed vast experiences in both the administration, training and certifications of maritime pilots; and secondly was to identify individuals who meet the first criteria and who occupied positions of power in their respective institutions. Based on these criteria a sample comprising of officials from NAMPORT; Maritime Administrations, METI’s; Port captains and pilots were identified as the ideal sample for the study. Invitation to participate in the study were send to them but many opted not to respond to the invitation. Because of these shortcoming data collection strategy was revised and decision was made to restrict the study to a specific country. Denmark was chosen because of its strong position as a maritime nation; it is known to have qualified, skilled and competent employees; is among the world’s leading shipping nations; the world largest in terms of operating tonnage; and the 13th largest in terms of own tonnage (Maritime Denmark, 2018, p.3). Denmark was in the forefront of implementing new technology of its maritime rec. Despite the latter, Denmark has a strong maritime education structure; it is whitelisted and recognize STCW certificates issued by South Africa where Namibian Seafarers are currently trained.
3.3 Data Collection

Document & material analysis and online desktop research formed the greatest sources for data collection. Both provided an incredible amount of data which was available online on the internet. Information was directly browsed and extracted from key organisations sites and from google-scholar. This ensured that results were promising and relevant. Desktop studies included the review of international and national legal and administrative frameworks; policies and procedures, company data and policies; and various reports. Telephone interviews were held with the specific individuals. The interviewed question consisted of both specific, unstructured and open-ended questions aimed at obtaining as much as possible information and to seek clarity on certain aspects that were unclear were send to participants via email. The sample was informed of their rights for participating in the study and data protection.

3.4 Data Analysis

A constant comparative method was used to analyse the collected data. Constant comparative method does not have fixed formulas or practical rules to use as guides, according to Yin (2018, p.165), much depends on a researches own style of rigorous empirical thinking, along with the sufficient presentation of evidence and careful consideration of alternative interpretations. Comparison is important in the development of a theory that is grounded in the data. According to Tesch (1990) “the main intellectual tool is comparison – the method of comparing and contrasting is used for practically all intellectual tasks during analysis: forming categories, establishing the boundaries of the categories, assigning the segments to categories, summarizing the content of each category, finding negative evidence etc. The goal is to discern conceptual similarities, to refine the discriminative power of categories and to discover patterns” (Tesch, 1990, p.90). When comparing, the study will tried to look at commonalities and differences, perspectives and reasons between the maritime pilot training schemes of NAMPORT and that of Denmark to make inductive analysis and conclusion.

A constant comparative method was used to analyse the data collected. The method compared the maritime pilot training scheme of both Denmark and Namibia and IMO Resolution A.960 (23). The comparisons on pilotage and maritime pilot training and certification was drawn from
the two countries’ national legislations, operation regulations and codes. The analysis focussed on each research question followed by a brief discussion on the similarities and differences of the two systems and best practices.

3.5 Key assumption and potential limitations

The dissertation was intended to investigate the training and certification of pilots who are confined to pilotage in port area declared compulsory pilotage area. All other pilots such as “deep-sea pilots, grand reef passage pilots, estuarial pilots, sea pilots, river pilots, dock pilots, company preference pilots, specialist pilots for VLCC and other peculiar crafts” are excluded (The Nautical Institute, 1990, p.11). Due to delays or unwillingness of participants to participate in the research on time, the research will greatly rely on literature review from e-resources from case countries to provide the dissertation with the relevant data. Due to time constraints; difficulties in having all participants respond to questionnaires in time and unwillingness of certain organisations to share their data due to confidentiality reasons, online desktop research was another method used during the study because

3.6 Ethical Considerations

An application for ethic clearance was made to the WMU Research Ethics Committee before the commencement of the research. Participation in this study is entirely voluntary. Participants may withdraw their consent to participate at any time, without giving reasons. Information obtained during the study will be treated with confidentiality and the confidentiality of the participants will be assured. Data collected will be stored on a special file that will be locked with a password. The same data and reports generated will be backup on an external drive that will be stored at WMU. The data collected will be stored for a period of one year after the attainment of the degree before it is destroyed. All information obtained during the study is confidential and that no information that participants disclose will lead to the identification of any individual in the reports of the project, either by the researcher or by any party. The confidentiality of the participants is assured. The results of the study will only be used for academic purposes. In addition to this, a declaration was signed to certify that no plagiarizing and falsification of information will be done and accepting responsibility for own work.
CHAPTER 4 - DATA COLLECTION AND FINDINGS

4.1 Maritime pilot training and certification in Denmark

4.1.1 Organisation

One of the agency of the Ministry of Industry, Business and Financial Affairs, is the Danish Maritime Authority (DMA) which is responsible for governing maritime affairs of Denmark and for the issuing of legislations, orders on maritime safety and maritime employment and social laws. DMA consists of a number of sections as illustrated in Figure 11. The seafarers, certification and social affairs section provide seafarers conditions of employment services and is also responsible for the issuing of certificates of competency, recognition, call sign, yachtsmen and maritime pilot. The safety of navigation, national waters enhances safety at sea in the Danish Realm and is responsible for the supervision of pilotage area amongst others. The maritime regulation and legal affairs section is engaged in work relating to legislative instruments aimed at promoting health, safety and environment for ships, seafarers and fisherman’s conditions on board and the water that they are navigating. It is also responsible for safety, legal advices; acts and international conventions and for a.
DPA oversee pilotage and pilot related matters. Its main responsibilities is to issue regulations for the conditions under which pilots and pilotage service providers must perform in Danish waters; supervising governmental and private pilot companies on the Danish market; issue and renew pilot certificates and pilot exemption certificates; and register pilotage service providers (Navigation through Danish Waters, 2017, p.26).

### 4.1.2 Legislations on maritime pilot training and certification

A number of legislations and orders has been developed to govern pilotage and maritime pilot training and certification as listed in Appendix B. The Pilotage Act no. 567 compel ships using the inner and outer territorial waters and loaded with oil; un-cleaned cargo holds that are not secured by inactive air; chemicals; gases; more than 5,000 tonnes of bunker oil on board; loaded with highly radioactive materials to make use of the services of a pilot. Section 8 of the Act encouraged practical training in the form of training in the company of a pilot while subsection
allow a pilot who provided such training to sit in at the examinations of a pilot trainees or pilots who was under his/her training. The Order on the issuing of pilot certificates and pilot exemption certificates, laid down conditions guiding the practical implementation of the maritime pilot training and certification system. Compulsory pilotage is determined by the activities of a ship and on the basis of safety as large ships may have navigation difficulties in certain areas due to narrow waters, sharp bends, strong current and shallow depth (Navigation through Danish Waters, 2017, p.4). Pilotage areas are denoted by a solid red line in Figure 12 and are demarcated from ports, fjords and other countries territorial waters. At present Denmark has seven pilotage service providers - Danish Pilot Service which is state-owned and competes with private operators on the market and enjoys exclusive rights to pilot vessels transiting into and out of the Baltic Sea through the Danish straits and private pilotage services providers such as Aarhus Pilot Services; Skagen Pilot Services; Hanstholm Port Pilot; Hirtslals Port Pilot and Limfjord Pilot Aps (Navigating through Danish Waters, 2017, p.27-28).

![Figure 12: Breakdown of pilotage areas in Danish Waters](image)

Source: Executive Order1201 (DMA, 2012, p.1)
Section 11, of the Pilotage Act, permits only persons holding valid pilot certificates issued by Danish Pilotage Authority (only issuing authority) to carry out pilotage activities with restrictions to the area covered by the pilot certificate and that pilot certificates are issued to an applicant on fulfilment of the condition in illustrated in Figure 13.

1. Is trained at a level permitting the applicant to navigate ships irrespective of their size;
2. Has several years of experience as a master or chief officer form relevant voyages;
3. Is suitable in terms of health;
4. Has special insight into and experiences with the pilotage area;
5. Has completed both theoretical training and training in the company of a pilot;
6. Has completed pilotage training in the form of special manoeuvres;
7. Has passed a defined aptitude test;
8. Is associated with a pilot station; and
9. Does not have any considerable overdue debts due to the public authorities, meaning amounts of or above DKK 50,000

Figure 13: Requirements for pilot certificate


In accordance to subsection 2, the above requirements are subject to a review by the DPA when necessary while pilot exemptions are allowed only in special circumstances, and that pilot certificate will never be issued for the piloting of ships that the pilots are not trained to navigate. Pilots who don’t meet the conditions for being issued with the certificate are required to should return their pilot certificates to the DPA. DPA may issue pilotage exemptions certificates to navigation officer holding extensive knowledge of the pilotage area and ship type, but such exemption shall be issued for a limited period of time and may be renewed in accordance with
specifications laid down by the Pilotage Authority (Act no. 567, 2006, p.4). Section 12, of the Act detail the conditions under which pilot certificates and pilot exemption certificates may be withdrawn.

4.1.3 Education requirements

Maritime education and training rest with DMA and the Danish Agency of Higher UDS. DMA is responsible short courses while the UDS is responsible for long-cycle maritime programmes in line with the Order on the training programme for masters - order no. 1324 of 17 December 2012; Order on the training programme for master (home trade) - order no. 1325 of 17 December 2012; Orders on the training programme for masters (restricted) - order no. 1326 of 17 December 2012 and the Grading scale order - order no. No. 114 of 3 February 2015. The educational requirements for maritime pilots are set out in Appendix C.

4.1.4 Training requirements

Training requirements comprises of two training types – maritime training (short courses) and training in the company of a pilot (on-the-job training). Pilots are required to attend BRM and emergency training course, ship manoeuvring, pilotage law course and personal safety courses designed for pilots. The courses are valid for a period of 5 years except for the personal safety course that shall be completed every 3 years (Order no. 1077, 2012, p.3). Training in the company of a pilot is conducted by a certified pilot and in line with the set requirements and to ensure that the maritime pilots achieve sufficient local knowledge in the specific pilotage area, port, fjords, channels and bridges in order to assess the risks related to navigation in those pilotage areas (Order no. 1077, 2012, p.16). The training achievements are determine by the achievement of the set sailing frequencies (number of pilotage assignments/sailing) in categories outlined in Table 3 and in pilotage area’s as illustrated in Figure xx.
Table 3: Sailing frequencies per category

Source: Executive Order1077 (DMA, 2012, p.16)

<table>
<thead>
<tr>
<th>Category A</th>
<th>Minimum 20 pilotage assignments/sailings/ongoing year from the date of certification in the pilotage area (high-risk ports and pilotage areas) with associated upgrade requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category A*</td>
<td>If a holder of a certificate with an A area has fulfilled the requirements for sailing frequency continuously for more than 5 years, the requirements is reduced to minimum 10 pilotage assignments/ongoing year.</td>
</tr>
<tr>
<td>Category B</td>
<td>Minimum 10 pilotage assignments/year from the date of certification in the pilotage area (medium-risk ports and pilotage areas, possibly with upgrade requirements).</td>
</tr>
<tr>
<td>Category B*</td>
<td>If the holder of a certificate with a B area has satisfied the requirements for sailing frequency continuously for 5 years, the requirements are reduced to a minimum of 5 pilotage assignments/sailings/ongoing year.</td>
</tr>
<tr>
<td>Category C</td>
<td>5 pilotage assignments/sailings or less/ongoing year from the date of certification in the pilotage area (low-risk ports and low number of pilotage assignments/year).</td>
</tr>
</tbody>
</table>
Figure 14: Pilotage area for each category

Source: Executive Order 1077 (DMA, 2012, p.17)

4.1.5 Certificate structure

Pilots applying for certification should meet the conditions set out in Table 3. DMA may grant exemptions from the stated conditions but a pilot certificate shall never be issued to a pilot ships that the pilot is not trained to sail. Pilot certificates are restricted to various ship sizes. DMA may lay down specific requirement for the upgrading of pilots. Applications with health certificates encumbered with annotation, may be requested to submit additional information for assessment (Order no. 1077, 2012, p.1-2). If a holder for more than 5 years has not performed minimum one pilotage assignment in category C area, the certification cannot be maintained for that specific area. A holder of a pilot certificate or pilot exemption certificate no longer satisfied the prevailing requirements for sailing frequency, the pilot certificate or pilot exemption certificate shall be forwards to the Danish maritime authority and
equally if a holder of a pilot certificate or pilot exemption certificate holds other valid pilotage areas, the pilot certificate or the pilot exemption certificate shall be forwarded to the Danish maritime authority after the holder has received a new valid certificate (Order no. 1077, 2012, p.16). Certificate upgrade shall be allowed on performing minimum three pilotage assignment and on fulfilment of the upgrade plan condition set by the Danish maritime authority. Conditions for pilot exemption certificate is provided in the Order, page 16.

Table 4: Pilot certificate requirements
Source: Executive Order1077 (DMA, 2012, p.1)

<table>
<thead>
<tr>
<th>Conditions for Pilot certificate</th>
<th>Source: Executive Order 1077 (DMA, 2012, p.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Has been trained to a level at which the applicant is able to sail a ship regardless of its size;</td>
<td></td>
</tr>
<tr>
<td>2. Has a maritime trading certificate as a master;</td>
<td></td>
</tr>
<tr>
<td>3. Has at least two years’ experience as a master or chief mate from relevant shipping operations;</td>
<td></td>
</tr>
<tr>
<td>4. Can prove adequate knowledge of electronic nautical charts (ECDIS);</td>
<td></td>
</tr>
<tr>
<td>5. Possess a valid health certificate without annotations;</td>
<td></td>
</tr>
<tr>
<td>6. Has undergone pilotage training as explained in item 4.1.5;</td>
<td></td>
</tr>
<tr>
<td>7. Has undergone training in the company of a pilot as explained in item 4.1.5;</td>
<td></td>
</tr>
<tr>
<td>8. Has special knowledge and experiences of the geographical pilotage area applying for as illustrated in table 3;</td>
<td></td>
</tr>
<tr>
<td>9. Has passed a defined theoretical and practical aptitude test as illustrated in appendix C;</td>
<td></td>
</tr>
<tr>
<td>10. Is associated with a pilotage service provider that is registered in accordance with section 24 of Danish pilot act;</td>
<td></td>
</tr>
<tr>
<td>11. Does not have any significant overdue debt to public authorities, defined as amount to the order of DKK 50,000 or more;</td>
<td></td>
</tr>
</tbody>
</table>

4.1.6 Aptitude test

Aptitude test for pilot certificate consist of practical and theoretical test. Practical test consist of a pilotage assignment in the application relates. Theoretical test consist of a 4-hours test examining the applicant local knowledge in each pilotage area applied for and in accordance with the aptitude test syllabus. The aptitude test panel is made up by the Pilot (trainer) and external examiner appointed by DMA. Aptitude test cost is paid by pilot trainee (Order no. 1077, 2006, p.4). Aptitude test for pilot exemption certificate shall be issued to an applicant on prove that he/she has achieved the prescribed sailing times for the specific pilotage area and has passed the defined theoretical aptitude test. An hour aptitude test examines the applicant
local knowledge in each pilotage area applied for and in line aptitude test syllabus Annexure D. The aptitude test panel shall consist of two people appointed by DMA in the roles of internal and external examiners. Aptitude test costs for both certificate are paid by pilot trainee (Order no. 1077, 2006, p.4). Pilots who have successful pass the aptitude tests and are waiting on their pilot certificates are prohibited to perform pilot duties or act as a pilot until issued with a pilot certificate by the DMA. Pilots failing to deliver their pilots certificates when required through section 4(3); 16(3) will be liable to punishment by fine (Order no. 1077, 2006, p.5).

4.1.7 Design and content of a pilot certificate

The design and content of pilot certificates shall be comply with the requirement outline in Appendix E.

4.1.8 Medical Fitness

Medical examination is required for the acquisition or renewal of CoC and for students approved to commence an approved training programme. These medical examinations are conducted by medical examiners appointed by the DMA, examination done by doctors not appointed by the authority is invalid. The medical examinations are conducted in accordance to the Order on medical examinations of seafarers and fisherman’s, Order no 999 of 12 August 2013.

4.2 Maritime pilot training and certification in Namibia

4.2.1 Organisation

The department of transport under the Ministry of Works and Transport (MWT) oversee the activities of the Directorate of Maritime Affairs, entrusted with the responsible of ensuring safety of life and property at sea; preventing and combating pollution of the marine environment by ships; and to promoting Namibia’s maritime interests. The directorate of maritime affairs comprises of three divisions as illustrated in Figure 15. The division of legal and international maritime affairs is responsible for the drafting, review and implementation of
national maritime legislation as well as advising government on maritime policies. The division of marine pollution control and search and rescue is responsible for preventing and combating pollution of the sea from ships, undertake search and rescue activities and operations at sea; while the division of surveys and inspection is responsible for ensuring safety of vessels, the execution of port state and flag state control; legislation and certification of Namibian seafarers and the registration of Namibian vessels. This division is also responsible for the evaluation of foreign maritime CoC of seafarers employed on Namibian ships to ascertain their compliance with relevant international conventional standards of training certification and watch keeping (STCW). It also conducts examinations and issue various class certificates of competence for deck and engineering officers. It also administer eyesight tests and medical tests for all sea men as prescribed in the National Merchant Shipping Act. It issue seafarers record books for Namibian citizens sailing on board ships.

![Figure 15: Organisation of the Directorate of Maritime Affairs](image)

Source: Author, based on data analysis
4.2.2 Legislations on maritime pilot training and certification

There is no specific national legislation that exclusively deals with maritime pilot training and certification. The regulation made in terms of the Merchant Shipping Act 57 of 1951, section 356 on education, training and certification of Namibian seafarers, regulate and “applies to all personnel employed on board Namibian vessels, manned and certified according to Namibian law, and to personnel employed on Namibian fishing vessels in a capacity for which a certificate of competence is required” (Government of the Republic of Namibia, 2004) while the Namibian Ports Authority Act, 1944 Port Regulations deals with port operations. Part III of the port regulations deals with port procedures for vessels and further set out conditions for matters illustrated in Table 5, of which one is the licensing of pilots and other matter that is of interest to the study.

Table 5: Part III of the Port Regulations

Source: Namibian Ports Authority Port Regulations (MWT, 2001, p.2)

<table>
<thead>
<tr>
<th>Section</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Requirements to enter port</td>
</tr>
<tr>
<td>18</td>
<td>Compulsory pilotage port</td>
</tr>
<tr>
<td>19</td>
<td>Licensing of pilot</td>
</tr>
<tr>
<td>20</td>
<td>Cancellation or suspension of pilot licence</td>
</tr>
<tr>
<td>26</td>
<td>Berthing of vessel</td>
</tr>
<tr>
<td>29</td>
<td>Manoeuvring and warning signals</td>
</tr>
<tr>
<td>31</td>
<td>Lights, signals and navigating rules for vessels in ports</td>
</tr>
<tr>
<td>32</td>
<td>Accidents in ports</td>
</tr>
<tr>
<td>34</td>
<td>Anchoring</td>
</tr>
</tbody>
</table>

Other legislation worth considering is the Namibian Ports Authority Act and the Pilotage Codes by NAMPORT. The sections illustrated in Table 6 are the core areas that will be discussed in the proceeding sections.

Table 6: Critical sections from the Namibian Ports Authority Act and Marine pilot manual for the study

Source: Author, from data analysis
Section 23 of the Act states that the ports of the Authority are compulsory pilotage ports and conditions outline in item 1.1 are enforced. Exemption from the conditions referred to be possible on approval by the Port Captain and conditions stipulated in section 23 of the act. Failure to adherence to these conditions may lead to a fine of N$ 20,000 or imprisonment of five years (MWT, 2001, p.10).

4.2.3 Education requirements

Namibia has two institutes of higher education, but none offer maritime studies. The University of Namibia has proposed a school of marine engineering and maritime studies and discussion to this is at an advanced stage with implementation foreseen in the years to come. NAMPORT recruits candidates through the seafarer/cadet training scheme. Successful candidate who meet the school requirements, medical examinations, age limit and are send to Cape Peninsula University of Technology (CPUT) or Durban University of Technology (DUT), South Africa to undertake their studies which entails obtaining a National Diploma in maritime studies (navigation). The programme structure and requirements are outline in Figure 16. The education and training period ranges between 5 to 5.5 years.
Figure 16: National Diploma in Maritime Studies (Navigation) education and training structure

Source: Author, based on data analysis
4.2.4 Training requirements

NAMPORT recognises that maritime pilots require specialised knowledge and experiences of the specific pilotage area and developed several training programmes – general pilotage training for certification and fast tracking pilot training for deck officer’s class 3 and 2. General training include practical training under the supervision of experienced pilots and in line with the training syllabus. The training shall incorporate the trainee’s experience in ship handling, pilotage duties and experiences required for the specific port or pilotage area for which the license will apply and consist of practical ship handling and various pilotage operations conducted in daylight and in darkness. Elements of training as defined in section 6 of the pilotage code include:

(a) Appropriate international, national and local legislation covering navigational safety and pollution preventions;
(b) The characteristics of the port or local pilotage areas as defined in the pilotage code;
(c) Theory of ship handling and tug usage, including simulator training where appropriate;
(d) Factors affecting the safe handling of vessels (including wind, current, tide, channel configuration, water depth, squat and interaction) and the limitation of particular propulsion and their limitations;
(e) The use of tugs (including their propulsion and manoeuvring characteristics) and their limitations;
(f) Attendance as an observer on a tug during operations, including operations during the hour of darkness.
(g) Use of current technology, bridge equipment and bridge resources management.
Figure 17: Pilotage Area

Source: Port Jurisdiction of the Port of Walvis Bay (NAMPORT, 2018)

To ensure effective training and record keeping, trainee pilots are obliged to keep record of movements during trainings, carry out a pilotage movement under the supervision of a pilot holding an unrestricted pilots license for the port area he/she is qualified for; be committed towards the training program (Pilotage Code, 2013, p.14). Assessment focusses on the demonstration of ship handling and navigation and English language test to determine the
trainee level of the English command. The training requirement and structure for the fast tracking pilot scheme of deck officers class 3 and 2 is outlined in Figure 18.

4.2.5 Examination and licencing

Trainees who have successfully completed the pilotage training and probation period will undergo formal examination invigilated by a panel comprising of the Port Captain, the Chief Pilot, Senior Pilot and Training coordinator (Pilotage Code, 2013, p.14).

4.2.6 Assessment
Section 6.5 of the pilotage code, assessment for pilotage licensing consist of both practical and oral examinations. Practical test focus on ship handling while the oral examination shall be based on the pilotage syllabus. Trainees who passed the training are placed under a 3-month probation programme where they will be expected to carry out a determined number of pilotage manoeuvres on determined size vessels and berth before they are issued the specific pilot licence.

4.2.7 Ongoing training and periodic reassessment

Ongoing training is done in consultation with the individual pilot and is influenced by changes in port conditions or pilotage area. Reassessments is scheduled done at intervals not exceeding 5 years to ensure continued proficiency. Section 6.6 of the Pilotage code oblige pilots due for reassessment to:

(a) Attend a manned model and ship simulator course every 5 years;
(b) Attend an advanced bridge resources management course;
(c) Have their CoC’s revalidated every 5 years to conform with STCW Convention as amended;
(d) Possess knowledge of the current international, national and local laws, regulations and other requirements and provisions relevant to pilotage duties.
CHAPTER 5 - DISCUSSIONS AND INTERPRETATION OF FINDINGS

5.1 Findings

The study’s results are summarised in Table 7 – 10 below presented in the order of the research question.

5.1.1 What competencies are required by pilots in order to provide safe and effective pilotage services at the port?

Table 7: Findings to research question 1
Source: Author, based on data analysis

<table>
<thead>
<tr>
<th>Country</th>
<th>Competencies</th>
</tr>
</thead>
</table>
| Namibia | Highest ethical and professional conduct.  
|         | Safe navigation of ships in restricted waters.  
|         | Technical knowledge of ship operation.  
|         | Local knowledge of the area.  
|         | Knowledge of latest equipment and navigational aids.  
|         | Knowledge of national and international regulations; and environmental requirements.  
|         | Accident investigation and reporting skills.  
|         | Voyage planning.  
|         | Good communication skills (both spoken and witting). |
| Denmark | Ships navigation (irrespective of their sizes).  
|         | Several years of experience as a master or chief officer from relevant voyages.  
|         | Special insight into and experience with the pilotage area  
|         | Knowledge of special manoeuvres.  
|         | Good communication skills (both spoken and witting). |
5.1.2 How and where are these competencies acquired and what is the training and educational duration of these competencies;

Table 8: Findings to research question 2

<table>
<thead>
<tr>
<th>Source: Author, based on data analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Namibia</strong></td>
</tr>
<tr>
<td>⇒ Education: National Diploma - Maritime Studies, facilitated by institutes of higher education.</td>
</tr>
<tr>
<td>⇒ Practical training: In-house pilotage training under close supervision of an experienced pilot while maritime courses are provided by external accredited METI.</td>
</tr>
<tr>
<td>⇒ Where: Accredited METI in South Africa Appendix F.</td>
</tr>
<tr>
<td>⇒ Duration: Education between 5 to 5.5 years and pilotage training between 2 to 3.2 years and maritime course between 3 – 10 days.</td>
</tr>
</tbody>
</table>

| Denmark                               |
| ⇒ Education: Master’s Mariner - facilitated by institutes of higher education. |
| ⇒ Practical training: In-hour pilotage training in the company of a pilot while maritime courses are provided by external accredited training institutions. |
| ⇒ Where: Accredited METI in Denmark Appendix F. |
| ⇒ Duration: Education between 1.5 to 2.5 years; pilotage training between 2-3 months and maritime courses between 3 – 5 days. |

| IMO Resolution A.960 (23) | ⇒ Obliged competent pilotage authorities to establish own training and licensing standards and does not subscribed METI. Article 5 required trainings to include practical training gained under closed supervision of experienced pilots which may be supplemented by simulation, both computed and manned model, classroom instructions or other methods |

IMO Resolution A.960 (23)
and CPA to establish training and certification standards sufficient to enable pilots to carry out their duties safely and efficiently.

5.1.3 What are the minimum standards of pilots training and certification internationally?

Table 9: Finding to research question 3
Source: Author, based on data analysis

<table>
<thead>
<tr>
<th>Source</th>
<th>Article 5, 6 and 7 outline the minimum standards and certification syllabus CPA’s should include during the development of their standards.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMO Resolution A.960 (23)</td>
<td></td>
</tr>
</tbody>
</table>

5.1.4 What are the gaps between the Namibian practices against Denmark?

Table 10: Findings to research question 4
Source: Author, based on data analysis

<table>
<thead>
<tr>
<th>Denmark</th>
<th>Namibia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similarities</td>
<td></td>
</tr>
<tr>
<td>⇤ Both recognised the important role maritime pilots play in the safety and environment protection.</td>
<td></td>
</tr>
<tr>
<td>⇤ Both trainings and certification systems were guided by national legislations.</td>
<td></td>
</tr>
<tr>
<td>⇤ Both training and certification were guided and informed by STCW Convention and IMO Resolution A.960 (23).</td>
<td></td>
</tr>
<tr>
<td>⇤ No additional trainings were recommended apart from those set by STCW and IMO Resolution A.960 (23).</td>
<td></td>
</tr>
<tr>
<td>⇤ Compulsory pilotage areas were used as areas for practical training.</td>
<td></td>
</tr>
<tr>
<td>Differences</td>
<td></td>
</tr>
<tr>
<td>⇤ Had numerous legislations and regulations in place;</td>
<td>⇤ Had limited legislation and regulation in place;</td>
</tr>
<tr>
<td>⇤ Have a CPA in place;</td>
<td>⇤ Pilotage code failed to address all relevant matters;</td>
</tr>
</tbody>
</table>
5.2 Discussions

The study findings revealed that both Denmark and Namibia gave effect to the recommendations proposed in IMO Resolution A.960 (23) and that their training and certification/licensing systems are directed towards developing pilot’s specialised knowledge and experienced of specific areas. However both countries has different legislations, regulations structures in place. Denmark had a one national legislation that is supported by a number of executive orders that attempted to provide guidelines in almost all aspect of pilot training and certification. Namibia does not have any specific legislation governing pilot training, but addressed certain areas of pilot training certification through two legislations. The situation creates major challenge that need urgent attention. Despite the latter there are major differences in the organisation and administration of pilot training and certification system. Greatest being the absence of/or an independent CPA for Namibia. Competencies determined for pilots are similar I both countries. DMA empowered DPA to lay down more detailed regulations on required pilot competencies. DPA had several local accredited METI’s while Namibia had none and relied on South Africa to train its pilots. However practical on-the-job training were provided by pilot’s employers and seem to be following the IMO recommendations. These trainings done under the supervision of a certified experienced pilot
and aimed at the same outcome. Denmark had developed several rules that governed the entire training process to ensure smooth implementation. Denmark require teachers to hold appropriately qualifications which is not the case in Namibia. NAMPORT had developed its own training programme based on international guidelines. The gaps as outline in table 10 indicate major areas of differences that Namibia should work on to ensure effective administration and organisation of pilot training and certification system. Several proposals on this will be discussed in chapter 6.
CHAPTER 6 - CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

In terms of the formulated research questions, the study and analyses indicated that:

(a) There are predefined competencies for pilots training and certification and that those competencies were developed to promote maritime safety and prevention and control of marine pollution from ships;

(b) There is no uniform system on the training and certification of pilots. Each country deals with it in its own manner in adherence to the minimum training and certification elements prescribed by IMO;

(c) IMO Resolution A.960 (23) is the international standards used for pilot training and certification; and

(d) There are legislative and operational difference between Namibia and Denmark.

IMO recommended pilot training to have standards sufficient to enable pilots execute their duties safely and effectively. As a result, most pilots trainings comprises of mandatory CBT designed to develop particular skills to perform a job i.e. ship handling and manoeuvring and ship operations. There is little or no mention of other trainings vital to address new developments and challenges faced by pilot in today’s world therefore there is a need to introduce new trainings in areas such as soft skills, professional codes of conduct, risk prevention and environmental management. These training could aid with team communications, teamwork, and problem solving, motivation, and cultural diversity, professionalism, psychological and physiological impediments, environmental protection (just to mention a few), which all fall in the professional domain of a pilot. Trainings should be tailored to the needs of an individual pilots abilities which should influence the length, degree and depth of such training. Areas where an individual pilot need more time should be identified and properly managed and remedial measures be put in place. There is a need to have universal
standards on pilot training and certification that ensure consistent trainings, certification, license categories, validity conditions, validation intervals and other requirements essential to safe and effective pilotage.

6.2 Recommendations

6.2.1. Namibia

6.2.1.1. The Directorate of Maritime Affairs through the Ministry of Works Transport should develop the necessary legislations and guidelines on maritime pilot training and certification in line with international requirements and best practices.

6.2.1.2. The Directorate of Maritime Affairs spearhead and promote the establishment of an independent competent pilotage authority to give full effect to IMO recommendations, including IMO Resolution A.960.

6.2.1.3. That the Government of the Republic of Namibia empower the Directorate of Maritime Affairs with the necessary resources so that it can to efficiently carry out its responsibilities.

1.4.2 Namibian Ports Authority

6.2.2.1. Review its pilotage code to expand on and/or provide for matters such as role players and responsibilities, CoC structure and mandatory requirements, calculation of seagoing service and responsibilities, appeals, medical examinations, requirements for seagoing service, recommended ancillary and safety course certification, human element – leadership and management education and training, navigation aids and equipment simulator trainings, qualification of teachers, medical fitness and eyesight standards.

6.2.2.2. Introduce new trainings such as mandatory in-service training that should be conducted every 2 years. Pilotage evolution training dealing for example with human factors, pilotage, legislative changes, technological innovation and pilotage organisation and additionally the trainings discussed in item section 6.1 and Appendix G should have training goals and learning outcomes clearly defined.
6.2.2.3. Review its training entry requirement to allow people such as tug masters with relevant experienced to join the pilot training program as they might qualify for admission at universities through recognition of prior learning. This will fast tract the pilotage training programme and ensure that there are enough pilots to meet the demands of the port.

6.2.2.4. To supplement the traditional hands-on training with modern classroom and simulation instruction whether on manned models, full mission or partial bridge simulators or personal computers to fast track sea going service of pilots;
References


Appendixes
Appendix A – Initial Training Elements

(Initial training is discussed under Figure 2.4.2.3)
Appendix B – Danish Legislations on Maritime pilot training and certification

Pilotage and Pilot Training and Certification legislations under Danish Maritime Authority and Danish Pilotage Authority

- Pilotage Act no. 567 (Consolidated pilotage act no. 352)
- Act amending the pilotage act and the act on Danish pilot no. 775
- Executive Order no. 1199 on activities of pilotage service providers and the obligations of pilots
- Amendment on Executive Order no. 1199 on activities of pilotage service providers and the obligations of pilots (no. 384)
- Amendment on Executive Order no. 1199 on activities of pilotage service providers and the obligation of pilots (no. 1382) (Only in Danish)
- Executive Order on the issuing of pilot certificates and pilot exemption certificates (1201)
- Attachments
- Amendment on Executive order on the issuing of pilot certificates and pilot exemption certificates (no. 471)
- Amendment on Executive order no. 1201 on the issuing of pilot certificates and pilot exemption certificates (no. 1312)
- Amendment on Executive order no. 1201 on the issuing of pilot certificates and pilot exemption certificates (no. 1067)
- Amendment on Executive order no. 1201 on the issuing of pilotage certificates and pilot exemption certificates (252) (Only in Danish)
- Executive Order no. 449 on the use of pilot
- Executive Order 1142 on ordering of pilot
- Executive Order no. 491 on payment for the Danish Pilotage Authority’s services
- Executive Order no. 1373 on approval and quality assurance, etc. of maritime training programmes

Legislation under the Danish Agency of Higher Education

- Executive Order no. 1324 on the training programme for masters
- Executive Order no. 1325 on the training programme for masters (home trade)
- Executive Order no. 1326 on the training programme for masters (restricted)
- Grading scale order 114
## Appendix C – Danish Educational requirements for pilot training

### Danish Education

1. **Training Programme – Masters**

   In accordance with the order on the training programme for Masters, Order no. 1334 of 17 December 2012

   The purpose of the training is to qualify the student for functioning as a manager in the maritime profession. The master shall be capable of forming part of the crew on merchant ships as a mate and, after having acquired the necessary duration of service, be capable of acquiring competency rights as a master. The training programme for masters shall meet the requirements of the STCW Convention, as amended, so that, following the prescribed duration of service, it shall be possible to issue certificates at the management level pursuant to part II/2 of the Convention for merchant ships with a gross tonnage of or above 3000. The training duration is 2.5 years (full time study) which can be completed within 5 year period. MElT may grant exemption from the stipulated time when justified by special conditions (section 6, 7 and 8). Conditions on the admission and acquisition of certificates; and required courses are provided in the table below.

<table>
<thead>
<tr>
<th>Objective of the training Programme</th>
<th>The training programme shall develop the student focusing on management, safety, operation, optimization and commercialization using English as the working language. The objective of the learning outcomes includes the knowledge, the skills and the competences that a master is to acquire from the training programme. The learning objective related to knowledge of the master is outlined in subsection 2 or the order.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission Requirement and acquisition of certificates</td>
<td>Pass 10th Grade leaving exam (Danish Felleseksamen) with subjects in Danish, English, Mathematics, Physics and Chemistry with exam mark of 12 according to 7 point marking scale; OR a mark 6 according to 13 point marking scale in each subject; OR passed maritime preparatory course; and completed the following courses: SAT (Basic level) with 12 months seagoing service as ordinary ships assistant; SAT (final course) with combined 15 months sea going service as ordinary ships assistant; vocational training in the field of iron and metal industries and SAT for persons holding a CoA combined 12 sea time as a ship assistant; SM training OR have 30 months relevant duration of sea going service in ships with a gross tonnage of or above 20 before February 2002 and have approval basic trainings as per Reg. VI/1 of STCW Convention and of A-VI/1, par. 2 on Basic training of the STCW Code.</td>
</tr>
<tr>
<td>Courses and References</td>
<td>Watch keeping on Bridge (incl. full mission training) Table A-I/1; ARPA - Table A-I/1; ECDIS - Table A-I/1; GMDSS Reg. IV/3; FFS - Reg. VI/3; OLR - Reg. VI/3, par. 1; theoretical basis for issuing a certificate of BTOC/GTCC - Reg. VI/1, par. 2.2; Reg. VI/2, par. 2.2; SPSST &amp; SS - Reg. VI/5, par. 1.2; MMS (for medicine chest category A): CoC in MO and OHC (only for member of safety group in merchant ships).</td>
</tr>
<tr>
<td>Additional</td>
<td>Hold a valid health certificate for seawarriors without limitations; be fit for lookout duty; hold watch keeping certificate; and completed practical training during the duration of services as prescribed in the training record book approved by the AHEES, however not as regards persons covered by subsection 3(y).</td>
</tr>
</tbody>
</table>

* A minimum of 12 months of the duration of service required for vocational training, shall have been acquired in merchant ships with a gross tonnage of or above 500, hereof 6 months in ship outside coastal trade.
2. **Training Programme for Master (Home – Trade)**  

   *In accordance with the order on the training programme for Masters: Order no. 1325 of 17 December 2012*

The purpose of the training programme for master (home trade) is to qualify the student for functioning as a mate on board merchant ships below 500 GT engaged in home trade as well as for being capable of acquiring competency as a master on ships below 500 GT engaged in home trade after having acquired the necessary duration of service. The training programme for master (home trade) shall meet the requirements STCW Convention, as amended, so that it is possible to issue certificates pursuant to part II of the Convention. The training duration is 0.5 year full time studies which can be completed within 1.5 year period. METI may grant exemption from the stipulated time when justified by special conditions (sections 6, 7 and 8). Conditions on the admission and acquisition of certificates; and required courses are provided in the table below.

<table>
<thead>
<tr>
<th>Objective of the training Programme</th>
<th>The training programme shall develop the student focusing on management, safety and operation optimisation. The learning objective related to knowledge is that the master (home trade) is outlined in subsection 2 of the order.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission Requirement and acquisition of certificates</td>
<td>Must have completed the basic course for ship assistant combined with 12 months sea time as an apprentice mate; or 18 months duration service as an ordinary ship assistant; have completed final course for ship assistant combined with 15 months duration of sea service as an ordinary ships assistant; have completed vocational training within the iron and metal industries and the ships assistant training programme for persons holding a CoA combined with 12 months duration of service as ships assistant; have completed a training programme as a ships mechanic; and have acquired 36 months relevant sea time on merchant ships with a gross tonnage of or above 20 before 1 February 2002 as well as have completed approved basic training in terms of Reg. VI/1 of STCW Convention and section A-VI, paragraph 2 of STCW Code on “Basic Training”.</td>
</tr>
<tr>
<td>Additional</td>
<td>Hold a valid health certificate for seafarers without limitations; be fit for lookout duty; hold watch keeping certificate; and completed practical training during the duration of services as prescribed in the training record book approved by the Agency of Higher Education support, however not as regards persons covered by subsection 2(5).</td>
</tr>
</tbody>
</table>

3. **Training Programme for Master (Unrestricted)**  

   *In accordance with the order on the training programme for Masters: Order no. 1325 of 17 December 2012*

The purpose of the training programme for master (unrestricted) is to qualify the student for functioning as a mate on board merchant ships engaged in trade on all seas as well as for being capable of acquiring competency as a master on ships below 5000 GT after having acquired the necessary duration of service. The training programme for master (unrestricted) shall meet the requirements of the STCW Convention so that it is possible to issue certificates for mates and masters, respectively, on ships below 3000 GT pursuant to regulation II/2 of the Convention. The training programme duration is 1.5 years full time studies which can be completed in 3 year period. METI, may grant
exemption from the stipulated time when justified by special conditions by special conditions. The admission and acquisition of certificates conditions are provided in the below table.

<table>
<thead>
<tr>
<th>Objective of the training Programme</th>
<th>The training programme shall develop the student focusing on management, safety, operation optimisation and internationalisation using English as the working language. The learning objective related to knowledge is that the major (restricted) is outlined in subsection 2 of the order.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission requirement and acquisition of certificates</td>
<td>Must have passed the 10th Grade leaving exam (Danish Folkemøde) in the subjects Danish, English, Mathematics, Physics and Chemistry at acquired exam mark 02 according to the 7-point marking scale or the mark 6 according 15-point marking scale in each subject or have passed the maritime preparatory course. Have completed the basic course for ships assistants combined with 12 months duration as an apprentice mate or 18 months duration as an ordinary assistant; Have completed the final course for ships assistant combined with 15 months duration as an ordinary ship assistant; Have completed vocational training within the iron and metal industries and the ships assistant training programme for persons holding a certificate of apprenticeship combined with 12 months duration of service as a ships assistant; Have completed a training programme as a ship's mechanic; or have acquired 36 months relevant duration of service in merchant ships with a gross tonnage of or above 20 before 1 Feb. 2002 as well as completed approved basic training meeting the requirements of Reg. V/1 of STCW Convention and section A-V/1, par. 2 of the STCW Code on &quot;Basic Training&quot;.</td>
</tr>
<tr>
<td>Addition</td>
<td>Hold a valid health certificate for seafarers without limitations; be fit for rockon duty; hold watchkeeping certificate; and completed practical training during the duration of services as prescribed in the training record book approved by the DA/HIEES, however not as regards persons covered by subsection 2(v).</td>
</tr>
</tbody>
</table>

*A minimum of 12 months of the duration of service required in merchant ships with a gross tonnage of or above 500, of which 6 months shall have been acquired in ships engaged in non-home trade.*
Appendix D – Danish Aptitude Test Syllabus

1. **Requirements for acquiring a pilot certificate** (in a certain pilotage area)
   1) Limits in the pilotage area
   2) International Regulations for Preventing Collision at Sea (COLREGS)
      a) Order on regulations for navigation etc. in certain Danish waters
      b) Relevant orders and regulations on navigation
      c) Danish pilotage act with associated orders
      d) Danish act on safety at sea and the Danish act on the marine environment
   3) Buoy systems in the area
   4) Characteristics of the lights and their angles of visibility and fog signals, racons and radio beacons, and other electronic aids in use in the area, including virtual buoy systems/AIS
   5) Name, position and characteristics of buoys, beacons, structures and other buoying devices in the area
   6) Names and characteristics of channels, shoals, headlands and other characteristic features in the area
   7) Bridge(s) and similar obstruction limitations, including air draughts
   8) Water depths in the whole area, incl. tidal water effects and other similar factors
   9) General knowledge of set, rate, rise and duration of the tides, and the use of tidal tables and real-time data and prevailing data systems for the area if any are available
   10) Routes, courses and distances in the area
   11) Anchorage areas, anchorage
   12) Ship handling during pilotage, anchoring, berthing and unberthing, manoeuvring with and without tug-boats and in emergency situations
   13) Communication and access to navigation information
   14) Navigational warning systems, including the kind of information that can be expected in the area
   15) Traffic separation schemes, vessel traffic services and other navigational regulations in the area
   16) Bridge and navigational aids
   17) Use of radar and other electronic equipment, its limitations and possibilities as an auxiliary tool for saling and anti-collision equipment
   18) Maneuvering behaviour for the type of ship to be piloted and limitations imposed by particular propulsion and steering systems
   19) Factors affecting ship performance such as wind, current, tide, channel configuration, water depth, sea-bed, bank and ship interaction including squat effect and under keel clearance
   20) Use and limitation of various types of tugboats
   21) Sufficient knowledge of English for the pilot to be able to communicate clearly
22) IMO Standard Marine Communication Phrases
23) IMO Code for the investigation of marine casualties and incidents
24) Bridge Team Management, including master-pilot relationship, operational procedures and Pilot Card
25) Prevention of pollution
26) Emergency and contingency plans for the area
27) Safe disembarkation and embarkation procedure and
28) Other relevant knowledge considered necessary.

Reference:
IMO Resolution A.960 (23), section 7.22

2. Requirement for acquiring a Pilot Exemption Certificate (in a specific pilotage area)

1) Limits in the pilotage area
2) International Regulations for Preventing Collision at Sea (COLREG)
   a) Order on regulations for navigation etc. in certain Danish waters
   b) Relevant orders and regulations on navigation
   c) Danish pilotage act with associated orders
   d) Danish act on safety at sea and the Danish act on the marine environment
3) Buoy systems in the area
4) Characteristics of the lights and their angles of visibility and fog signals, radars and radio beacons, and other electronic aids in use in the area, including virtual buoy systems/AIS
5) Name, position and characteristics of buoys, beacons, structures and other buoying devices in the area
6) Names and characteristics of channels, shoals, headlands and other characteristic features in the area
7) Bridge(s) and similar obstruction limitations, including air draughts
8) Water depths in the whole area incl. tidal water effects and other similar factors
9) General knowledge of set, rate, rise and duration of the tides, and the use of tidal tables and real-time data and prevailing data systems for the area if any are available
10) Routes, courses and distances in the area
11) Anchorage areas, anchorage
12) Ship handling during pilotage, anchoring, berthing and unberthing, manoeuvring with and without tug-boats and in emergency situations
13) Communication and access to navigation information
14) Navigational warning systems, including the kind of information that can be expected in the area
15) Traffic separation schemes, vessel traffic services and other sailing regulations in the area
16) Prevention of pollution
17) Emergency and contingency plans for the area
18) Manoeuvring behaviour for the type of ship to be piloted and limitations imposed by particular propulsion and steering systems
19) Factors affecting ship performance such as wind, current, tide, channel configuration, water depth, sea-bed, bank and ship interaction including squat effect and under keel clearance
20) Use and limitation of various types of tugboats
21) Sufficient knowledge of English for the pilot to be able to communicate clearly
22) IMO Standard Marine Communication Phrases
23) IMO Code for the investigation of marine casualties and incidents
24) Bridge Team Management, including master-pilot relationship, operational procedures and Pilot Card
25) Prevention of pollution
26) Emergency and contingency plans for the area
27) Safe disembarkation and embarkation procedure and
28) Other relevant knowledge considered necessary, including
   a) squat effect
   b) under keel clearance
29) Duty to report.

References:
IMO Resolution A.960 (23), section 7.
Appendix E – Design and Content of pilot certificates
Appendix F – Accredited METIs

ACCREDITED METI FOR NAVIGATION
DENMARK

Approved Institutions of Higher Education
1. Svedborg International Maritime Academy (SIMAC)
2. Maruu Navigationsschool

Approved Maritime Training Centres in
1. Simac (Svedborg)
2. Martec (Skagen Skipperkole and Training Ship Denmark) Frederikshavn
3. Maruu Nautical Training Institute
4. Greenland Maritime Centre / Imariernermik Ilmimarfiik
5. Svedborg Nautical School (Svedborg)
6. Training Ship Georg Stige (Copenhagen)
7. Nytrof Nautical School
8. Fiskeriskolen EUC Nordvest (The Danish Fishing School)
9. Centre for Maritime Health Services
10. Force Technology (Lyngby)
11. North Sealand Firefighting School (Elsinore)
12. Falck Safety Services (Esbjerg)
13. RESC. Rescue & safety centre
14. Northern Jutland Fire Department (Frederikshavn)
15. East Jutland Fire Department
16. Danish Shipping – Danish Shipping Academy
17. Green – Jakobsen
18. SAMAJU Uddannelse ApS (Svedborg/Elsinore)
19. Maersk Training (Esbjerg A/S)
20. Maersk Training (Svedborg)
21. MacCore Development (Svedborg)

22. Lloyds Register (Hellerup)
23. SAT - Training
24. Clipper Marine Services – INDIA (Mumbai, India)
25. Torim A/S (Hellerup)
26. Sea Health & Welfare (Rødovre)
27. Faruno INS Training Centre (Hvidovre)
28. Vikings Saastua ApS

Overview of Radio Schools approved for
GMDSS Radio Courses
1. School of Home Guard, (Marinestation Sliphavn)
2. Navigation & VHF School (Mogens Larsen)
3. Manseskoen, dk (Jørgen Ericksen)

SOUTH AFRICA

Approved Institutions of Higher Education
1. Durban University of Technology (DUT)
2. Cape Peninsula University of Technology (CPUT)

Approved Maritime Training Centres in
3. SAMTRA
4. Unicorn Shipping
5. SA Navy (SAS Saldhana Naval College)
6. Anchor Powerboat Academy
7. Concord Maritime Training
8. Siyaloba Training Academy
9. Port Academy of SA
10. CPUT Survival Centre
## Appendix G – Marine Courses

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Bridge Resources Management (BRM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Objective(s):</td>
<td>To train pilots in the correct exchange of information between pilot and ship's master prior to and during the pilotage, including: Pilot Card; passage planning, including emergency procedures; information about mooring, types of tugboats, use of tugboats; exchange of special information, current, tide and traffic conditions; unusual ship-handling characteristics, crew limitations, technical difficulties and deficiencies; confirmation of which languages are used for internal and external communication; safe, correct communication with the ship's master and the bridge watchkeeping personnel; safe, efficient allocation of work on the bridge, both during piloting and in an emergency situation and ensuring the efficient exchange of information.</td>
</tr>
<tr>
<td>Learning Objectives:</td>
<td>The learning objectives of the learning outcome includes the knowledge, the skills and the competencies that Pilots is to acquire from the course.</td>
</tr>
<tr>
<td>Course Reference:</td>
<td>STCW '95, as amended; IMO Resolution A.960 (23), subsections 5.3, 5.4 and 5.5 &amp; Guidelines for renewal of certificate of competency for navigators and tanker certificates on management level.</td>
</tr>
<tr>
<td>Target Group:</td>
<td>Pilots and Trainee Pilots.</td>
</tr>
<tr>
<td>Validity:</td>
<td>This course is for pilots and pilot trainees only and shall, as a minimum, be completed every 5 years, in accordance with the pilot training requirements.</td>
</tr>
<tr>
<td>Course Outcome:</td>
<td>A certificate shall be issued for a theoretical and practical satisfactory completion of the course.</td>
</tr>
<tr>
<td>Teaching method:</td>
<td>Simulation, both computer and manned model, classroom instruction, or other training methods. Case study - simulator training of BRM in a full mission simulator, including planning, briefing, communication and teamwork.</td>
</tr>
<tr>
<td>Assessment method:</td>
<td>Comprises of written, oral and practical examination on the elements of training provided during training.</td>
</tr>
<tr>
<td>Pre-requisites:</td>
<td>#</td>
</tr>
<tr>
<td>Course Duration:</td>
<td># days</td>
</tr>
</tbody>
</table>

### SUBJECT TITLE

<table>
<thead>
<tr>
<th>Subject Title</th>
<th>Subject Content</th>
</tr>
</thead>
</table>
| 1. Communication | * rules of good communication  
* limitations and strengths in verbal communication  
* context and perspective |
| 2. Briefing | * joint situation perception |
| 3. People's physical and Psychological limitations and strengths, including | * perception  
* interpretation and situation perception  
* memory  
* fatigue, stress and workload |
| 4. The relationship between crew and pilot | * cultural problems  
* expectations  
* management, the group and the individual |
| 5. Emergency Response | * loss of steering  
* loss of main engine, etc.  
* radar faults  
* loss of vital systems, such as Gyro and ECDIS – blackout  
* collisions, groundings, oil spill and search and rescue  
* handling of other crises and accidents during pilotage. |

### Important notes

#
Course Title: Ship Manoeuvring for Pilots (Ship Handling)

Course Objectives: To train the pilot in basic/elementary ship handling techniques in a relevant demarcated sailing area and give the pilot knowledge and an understanding of how a POD propulsion system works.

Learning Objectives: The learning objectives of the learning outcome includes the knowledge, the skills and the competencies that Pilots is to acquire from the course.

Course Reference: STCW '95, as amended; IMO Resolution A.960 (23), subsection 5.5.6.

Target Group: Pilots and Trainee Pilots

Validity: This course shall be completed at a minimum every five years in accordance with pilot training requirements.

Outcomes: A certificate shall be issued to the course attendees for a theoretical and practical satisfactory completion of the course.

Teaching Methods: Simulation, both computer and manned model, classroom instruction, or other training methods

Assessment Methods: Comprises of written, oral and practical examination on the elements of training provided during training.

Course Duration: # days

<table>
<thead>
<tr>
<th>SUBJECT TITLE</th>
<th>Subject Content</th>
</tr>
</thead>
</table>
| 1) Navigation (Theory) | Theoretical examination in:  
  - Manoeuvring possibilities and strategies  
  - Stopping distance  
  - Williamson turn  
  - Constant rate of turn techniques  
  - Use of throttles  
  - Ships with Azimuth propellers  
  - Rudders, types and effect  
  - Propeller(s), types, effect, reversing effect, twin propeller ships  
  - Harbour manoeuvring with propellers and several rudders  
  - Banking effect  
  - Overtaking  
  - Encounter with other ships, including ship-ship interaction effect  
  - Navigation in various weather conditions, including wind, current and wave effect  
  - Anchoring in general and twin anchoring with stern approach  
  - Instrument navigation in reduced visibility or when sailing at night  
  - Use of tugboats and escort towing  
  - Squat effect  
  - Under keel clearance  
  - Pivot point  
  - Hydrodynamics  
  - Use of POD and Joystick/DP systems  
  - Handling of large Cruise ships |

| 2) Navigation (Practical) | Navigational training that supports and illustrates the above-mentioned theoretical elements, including:  
  - Harbour manoeuvrings with various relevant ship types and equipment  
  - Harbour manoeuvrings under conditions where manoeuvring limits for POD/Azimuth propellers are tested  
  - Navigation and approach of relevant harbours with various POD/Azimuth propeller driven ships  
  - Harbour manoeuvring with twin propellers and rudder  
  - Harbour manoeuvring using tugboats  
  - Navigation and approach in various weather conditions (wind, current and waves)  
  - Navigation under the influence of hydrodynamic effects, e.g. banking effect |
Course Title: Pilotage law course for pilots

Course Objectives: To provide pilots with knowledge of relevant prevailing international and national laws, rules and other provisions.

Learning Objectives: The learning objectives of the learning outcome includes the knowledge, the skills and the competencies that Pilots is to acquire from the training programme.

Course Reference: IMO Resolution A.960 (23), subsections 5.5.8 and 6.3 and guidelines on the renewal of certificate of competency for navigators and tanker certificate on management level.

Target Group: Pilots and pilot trainees

Validity: This course shall be completed at a minimum every five years in accordance with pilot training requirements.

Outcomes: A certificate shall be issued to the course attendant for a theoretical and practical satisfactory completion of the course.

Teaching Methods: Simulation, both computer and manned model, classroom instruction, or other training methods.

Assessment Methods: Comprises of written, oral and practical examination on the elements of training provided during training.

Pre-requisite: #

Course Duration: # days

SUBJECT TITLE Subject Content

Pilotage Law
- The structure of the legal system and the administration
- The Namibian Pilotage act and the orders, etc. in force
- Employment for pilots
- Obligations of pilots
- Compulsory pilotage obligation
- The obtaining of a pilot certificate and pilot exemption certificate
- The pilot’s liability and freedom from liability – including sanctions
- Maritime inquiry/witness statement
- The merchant shipping act
- Deep-sea pilotage.

Important Notes: #
**Course Title:** Personal Safety course for pilots

| **Course Objectives:** | To train pilots in personal safety, techniques of personal survival at sea, emergency and first aid procedures, including heart massage, resuscitation, including hypothermic prevention measures. The pilot shall also be provided with knowledge of risks and measurements in connection with transfer of people and shall be able to act efficiently in man-over-board and evacuation situations. |
| **Learning Objectives:** | The learning objectives of the learning outcome includes the knowledge, the skills and the competencies that Pilots is to acquire from the course. |
| **Course Reference:** | IMO Resolution A.860 (21), sections 5.5.9, 5.5.10 and 5.5.11, Guidelines for renewal of certificate of competency for navigators and tanker certificates on management level. |
| **Target Group:** | Pilots and trainee pilots |
| **Validity:** | This course shall be completed at a minimum every five years in accordance with pilot training requirements. |
| **Outcomes:** | A certificate shall be issued to the course attendant for a theoretical and practical satisfactory completion of the course. |
| **Teaching Methods:** | Simulation, both computer and manned model, classroom instruction, or other training methods |
| **Assessment Methods:** | Comprises of written, oral and practical examinations on the elements of training provided during training. |
| **Pre-requisite:** | # |
| **Course Duration:** | # days |

**SUBJECT CONTENT**

**First aid**
- The four main principles of first aid
- Life-saving first aid, including the use of heart starter
- Cardiovascular diseases
- Cardiac infarct/angina
- Drowning and hypothermia
- Crush/heel/falling injuries
- Arrest of bleeding
- Communication with injured persons.

**Safety at sea**
- Personal life-saving appliances, including emergency transmitter
- Risks and precautions by person transfer
- Precautions if the pilot falls overboard, including possibilities and limits of the vessel in relation to rescue.
- Familiarity with water emergency suit
- Survival techniques in water
- Helicopter hoist
- Capsizing exercises
- Possibilities and limits of the life raft
- Evacuation methods from large vessels, including evacuation chute 13
- Summary evacuation exercise

**IMPORTANT NOTES**
- To ensure that the pilot becomes familiar with the possibilities and limits of his personal equipment, the practical part of the course shall be carried out with the same type of equipment that is used by the pilot. Hence the pilot shall bring his own suit and west for the course. The course is completed when the attendants, in a practical exercise, has demonstrated knowledge of:
  - The acquired theoretical knowledge in a written test. At a minimum 80% of the answers given shall be correct.
  - Proper passage on the pilot ladder.
  - Proper behaviour in relation to capsizing in open vessels.
  - Individual and collective survival techniques in water.
  - Entering the raft and stay and reversal using a size of raft similar to the pilotage service provider's.
  - Correct behaviour in connection with rescuing a person from the sea both as the salvaged and salving party by the use of a similar size of raft that is used by the pilotage service provider. The exercise shall be carried out with typically used salvage tools such as cradle and rescue sling.
  - Correct individual and collective behaviour in connection with the summary evacuation exercise. The evacuation exercise shall accumulate the practical elements in connection with evacuation from vessel to water, water to life raft and from life raft to helicopter.
# Course Title:
Ship to ship operations (STS)

<table>
<thead>
<tr>
<th><strong>Course Objectives:</strong></th>
<th>To train the pilot in more advanced ship handling techniques, and at the same to practise good communication between the master and the pilot in actual ship handling exercises.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learning Objectives:</strong></td>
<td>The learning objectives of the learning outcome include the knowledge, the skills and the competencies that Pilots is to acquire from the course.</td>
</tr>
<tr>
<td><strong>Course Reference:</strong></td>
<td>IMCO Resolution A.950 (23), section 5.3.6. OCIMF Ship to Ship Transfer Guide The Danish Maritime Authority’s order no. 734 of 25 June 2007 on transfer of oil cargo between ships in Danish territorial waters</td>
</tr>
<tr>
<td><strong>Target Group:</strong></td>
<td>Pilots and trainer pilots</td>
</tr>
<tr>
<td><strong>Validity:</strong></td>
<td>This course shall be completed at a minimum every five years in accordance with pilot training requirements.</td>
</tr>
<tr>
<td><strong>Outcomes:</strong></td>
<td>A certificate shall be issued to the course attendant for a theoretical and practical satisfactory completion of the course.</td>
</tr>
<tr>
<td><strong>Teaching Methods</strong></td>
<td>Simulation, both computer and manned model, classroom instruction, or other training methods</td>
</tr>
<tr>
<td><strong>Assessment Methods</strong></td>
<td>Comprises of written, oral and practical examination on the elements of training provided during training.</td>
</tr>
<tr>
<td><strong>Pre-requisite:</strong></td>
<td>Participants in STS part II requires completion of the STS part I course, and at a minimum ten STS operations over the past five years.</td>
</tr>
<tr>
<td><strong>Course Duration:</strong></td>
<td>Maximum days</td>
</tr>
<tr>
<td><strong>SUBJECT TITLE</strong></td>
<td><strong>SUBJECT CONTENT</strong></td>
</tr>
</tbody>
</table>
| **Tug handling course for pilot (Stage 1, STS part I)** | - Ship to shore operations  
- Ship handling in connection with ship to ship operations  
- Connection between the effect of rudders and propulsion  
- Use of bow thrusters  
- Use of various kinds of tugboats and bow to use them  
- Ship to ship operations without use of tugboat  
- Navigation and ship handling in narrow waters and in port  
- Ship handling under various wind and current conditions  
- Tide effect  
- Banking effect  
- Anchoring ships  
- Emergency response  
- Navigation with fenders  
- Fender location, their strength and limitations and their mooring  
- Mooring procedures according to varying conditions  
- Moorings and force effects  
- Mooring arrangement, contact and agreement with another ship  
- Briefing and exchange of experience between the master, the pilot and the mooring master  
- Debriefing after ship to ship operation. |
| **Ships up to 65,000 GT (Stage 2, STS part II)** | - Ship handling under various wind and current conditions  
- Anchoring of mother ship  
- Fender location, their strength and limitations and their mooring  
- Connection between the effect of rudders and propulsion  
- Mooring procedures according to varying conditions and under force effects on moorings and fenders, including the order of moorings at arrival and departure  
- Use of various types of tugboats, including advantages and disadvantages of the tugboats’ position and place of use. |

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Course Title: Tug handling course for pilots

Course Objectives: To increase the pilot's understanding of tugboat operations, their possibilities and limitations, and to ensure good communication between master and pilot in the actual manoeuvring exercises.

Learning Objectives: The learning objectives of the learning outcome includes the knowledge, the skills and the competencies that Pilots is to acquire from the course.

Course References: IMO Resolution A.960 (22), subsection 5.5.6.

Target Group: Pilots and Trainee Pilots

Validation: To be completed, as a minimum, every 5 years, in terms of the training condition of the Ship to ship operations.

Outcomes: A certificate shall be issued to the course attendant for a theoretical and practical satisfactorily completion of the course. The Tug handling course for pilots is equated with the completion of Ship to Ship Operations, part 1.

Teaching method: Simulation, both computer and manned model, classroom instruction, or other training methods

Assessment method: Comprises of written, oral and practical examination on the elements of training provided during training.

Pre-requisites: Participants in STS part III requires completion of the STS part II course, and at a minimum ten STS operations over the past five years.

Course Duration:

<table>
<thead>
<tr>
<th>SUBJECT TITLE</th>
<th>SUBJECT CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tug Handling</td>
<td>Theoretical examination of:</td>
</tr>
<tr>
<td></td>
<td>* Hydrodynamic elements</td>
</tr>
<tr>
<td></td>
<td>* The pivot point's influence under towing</td>
</tr>
<tr>
<td></td>
<td>* Dangerous situations under towing</td>
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<tr>
<td></td>
<td>* Towlines</td>
</tr>
<tr>
<td></td>
<td>* Direct and indirect towing – Transverse Arrest</td>
</tr>
<tr>
<td></td>
<td>* Escort towing</td>
</tr>
<tr>
<td></td>
<td>* Use of various types of tug boats, including conventional, Azimuth Stern Drive, Voith Schneider, Rover Tug and escort</td>
</tr>
<tr>
<td></td>
<td>* Emergency response with tug boats</td>
</tr>
<tr>
<td></td>
<td>* Harmon factors, including communication exercises and orders to the tug boat</td>
</tr>
<tr>
<td></td>
<td>* Navigational training that supports and illustrates the above mentioned theoretical elements, including</td>
</tr>
<tr>
<td></td>
<td>a. Use of various types of tug boats, including Azimuth Stern Drive tug boats</td>
</tr>
<tr>
<td></td>
<td>b. Escort towing</td>
</tr>
<tr>
<td></td>
<td>c. Emergency response</td>
</tr>
</tbody>
</table>

Important Notes: The Tug handling course for pilots is equated with the completion of Ship to Ship Operations, part 1.
1. Navigation and Watch keeping services (10 ECTS Credit)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Central Themes</th>
<th>Assessment Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigation</td>
<td>• Positioning&lt;br&gt;• Navigation equipment&lt;br&gt;• Charts and manuals&lt;br&gt;• Maneuvering</td>
<td>Exam</td>
</tr>
<tr>
<td>Watchkeeping</td>
<td>• Regulations for preventing collisions at sea&lt;br&gt;• Collisions prevention&lt;br&gt;• Watchkeeping procedures&lt;br&gt;• Communication</td>
<td>Exam</td>
</tr>
<tr>
<td>Meteorology</td>
<td>• Weather systems&lt;br&gt;• Retrieval of information&lt;br&gt;• Voyage planning</td>
<td>Internal test</td>
</tr>
</tbody>
</table>

2. Administration, Management and Communication (6 ECTS Credit)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Central Themes</th>
<th>Assessment Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maritime law and administration</td>
<td>• Employment law&lt;br&gt;• Maritime law obligations of masters&lt;br&gt;• Technical operation and administration&lt;br&gt;• General administration&lt;br&gt;• Entrepreneurship&lt;br&gt;• Computers</td>
<td>Internal Test</td>
</tr>
<tr>
<td>English</td>
<td>• Maritime English&lt;br&gt;• Safety Communication</td>
<td>Exam</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td>Exam and completion of Restricted operators certificate (ROC)</td>
</tr>
</tbody>
</table>

3. Safety, health and Maritime Security (7 ECTS Credits)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Central Themes</th>
<th>Assessment Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety and environmental protection</td>
<td>• Environmentally sound ship operation and pollution prevention&lt;br&gt;• Maritime safety management&lt;br&gt;• Operation of liferaft, life craft and rescue boats&lt;br&gt;• The ISM code, occupational health and pollution prevention&lt;br&gt;• Maritime security</td>
<td>Internal test</td>
</tr>
<tr>
<td>Firefighting and fire management</td>
<td>• Organisation of fire prevention&lt;br&gt;• Instructions concerning fire preparedness&lt;br&gt;• Firefighting and evaluation of fire preparedness</td>
<td>Complete a course in firefighting for ships.</td>
</tr>
<tr>
<td>Medical examiner training programmes</td>
<td></td>
<td>Completed medical examiner training programme for medicine chest category B</td>
</tr>
</tbody>
</table>

4. Ship Construction (7 ECTS Credits)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Central Themes</th>
<th>Assessment Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship construction and cargo handling</td>
<td>• The construction of ship types&lt;br&gt;• Stability&lt;br&gt;• Corrosion of the ship and its equipment&lt;br&gt;• Cargo handling in general and where the cargo constitutes a safety or environmental risk&lt;br&gt;• International regulations on dangerous goods</td>
<td>Exam</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td></td>
<td>Internal test for Certificate of Proficiency in motor operation</td>
</tr>
<tr>
<td>Use of bow thruster</td>
<td></td>
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<td>---------------------</td>
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<tr>
<td>Emergency response</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A review of current national regulation and international guidelines</td>
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<td></td>
</tr>
<tr>
<td>Navigation exercises in a full mission simulator that increases in difficulty and include:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. anchoring in connection with STS operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. STS operations under navigation (suction/pressure effects)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. ship handling with large draught to obtain ‘tide effect’, including the effect of difference in the ships’ draughts at ship to ship operations.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Ships larger than 65,000 GT (Stage 3, STS part III)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetition of the training in theory, principles etc. from STS part I</td>
</tr>
<tr>
<td>Intensive and comprehensive simulator training in all types of STS operations, including emergency response</td>
</tr>
<tr>
<td>Briefing before and debriefing after all simulator exercises.</td>
</tr>
</tbody>
</table>

**IMPORTANT NOTES:**

Participation in STS part II requires completion of the STS I course or the Tug Handling course for pilots.