CHAPTER ONE

1.1. Introduction

Shipsare large complex vehicles which must be self-sustaining in their environmentfor long periods with a high degree of reliability. A ship is the product oftwo main areas of skill, those of the naval architect and the marine engineer.The naval architect is concerned with the hull, its construction, form,habitability and ability to endure its environment. The marine engineer isresponsible for the various systems which propel and operate the ship. Morespecifically, this means the machinery required for propulsion, steering,anchoring and ship securing, cargo handling, air conditioning, power generationand its distribution. Some overlap in responsibilities occurs between navalarchitects and marine engineers in areas such as propeller design, thereduction of noise and vibration in the ship's structure, and engineering servicesprovided to considerable areas of the ship. This project will look into thepropulsion system with specific emphasis on the shafting system of a vesselcarrying out a detailed design and analysis.

Theshafting system which is part of the propulsion system of a vessel is a major acomponent onboard vessel. The shafting system directs the power generated bythe engine to the propeller which then provides thrust for the vessel. Marinepropulsion is the mechanism or system used to generate thrust to move a ship orboat across water. While paddles and sails are still used on some smallerboats, most modern ships are propelled by mechanical systems consisting of anelectric motor or engine turning a propeller, or less frequently, in pump-jets,an impeller. Until the application of the coal-fired steam engine to ships inthe early 19th century, oars or the wind were used to assist watercraftpropulsion. Merchant ships predominantly used sail, but during periods whennaval warfare depended on ships closing to ram or to fight hand-to-hand, galleywere preferred for their maneuverability and speed. The Greek navies thatfought in the Peloponnesian War used triremes, as did the Romans at the Battleof Actium. The development of naval gunnery from the 16th century onward meantthat maneuverability took second place to broadside weight; this led to thedominance of the sail-powered warship over the following three centuries.

Inmodern times, human propulsion is found mainly on small boats or as auxiliarypropulsion on sailboats. Human propulsion includes the push pole, rowing, andpedals.

Propulsionby sail generally consists of a sail hoisted on an erect mast, supported bystays, and controlled by lines made of rope. Sails were the dominant form ofcommercial propulsion until the late nineteenth century, and continued to beused well into the twentieth century on routes where wind was assured and coalwas not available, such as in the South American nitrate trade. Sails are nowgenerally used for recreation and racing, although innovative applications ofkites/royals, turbo sails, rotor sails, wing sails, windmills and Skysails' ownkite buoy-system have been used on larger modern vessels for fuel savings. A ship moves between two mediums (water andair) hence the increased resistance to motion. To overcome this, a suitablepropulsion system with an effective shafting system should be selected to meetthe specific vessel requirements. By evaluating and assessing the vessel designand intended operation profile together at an early stage, from a propulsionperspective, this will ensure that all interfaces within the drive-line,control and monitoring systems are precisely defined, resulting in theinstallation of an optimized, fully integrated shafting system.

Thedesign and general assembly of the shafting system of a vessel is very crucialto the successful operation of the vessel. A well designed shafting system,will reduce fuel consumption and ensure maximum power transfer from the engineto the propeller. In this report we shall look into the design and fabricationof shafting system for a vessel carrying out detailed design analysis of thevarious components of the shafting as well as make modifications andimprovements of existing shafting systems.

1.2. Background information

Small,mechanically-operated shafting are typically fitted in sailing boats and othersmall craft. Compact hydraulically-operated shafting, including two-speedversions, are suitable for pleasure craft and workboats including those forfishing, wind farm support, and pilot and harbor vessels, while larger modelsare specially designed for fast craft such as defense vessels, super and megayachts and high-speed ferries. For commercial, ocean-going vessels such asfreighters and tankers, heavy-duty shafting with various power take-off (PTO)and power take-in (PTI) arrangements can be specified to match medium-speeddiesel engines.

Largemotor yachts, naval, customs and coastguard vessels and fast ferries allrequire compact, high performance shafting, most of which are speciallyconfigured to comply with a ship designer's requirements. These shafting can berigged with optional equipment and monitoring systems to meet stringentenvironmental and technical specifications where safety, availability andreliability are of utmost importance.

Forextremely demanding applications in commercial vessels with extended annualoperation. Various non-reversing shafting are also available, with hollowoutput shaft, designed for controllable pitch propeller (CPP) operation. Theshafting system on a ship transmits power from the engine to the propeller. Itis made up of shafts, bearings, and finally the propeller itself. The thrustfrom the propeller is transferred to the ship through the shafting system. Thedifferent items in the system include the thrust shaft, one or moreIntermediate shafts and the tail shaft. These shafts are supported by theThrust block, intermediate bearings and the stern tube bearing. A sealingArrangement is provided at either end of the tail shaft with the propeller andcone completing the arrangement.

1.3. Statement of problem

Theprimary function of any marine engineering plant is to convert the chemicalenergy in fuel into useful work and to use this work for propulsion of theship. To ensure that this energy generated is effectively utilized forpropulsion, an efficient shafting system is required transfer the powergenerated from the engine to the propeller of the vessel. An efficient shaftingsystem will reduce the energy loss accustomed to energy transfer and reducefuel consumption of the main engine. This project looks at the direct driveshafting system, carrying out a detailed design analysis of the components.

1.4Aim of project

Theaim of this project is the design and fabrication of a direct drive shaftingsystem of a vessel.

1.4.1Objectives of the project

Theobjectives of this project include:

1. ToIncrease the power output of the shafting system by maximizing the powerdelivered by the engine.
2. Selectionof low cost energy efficient materials for the design and construction of adirect drive shafting system.
3. Toproduce a direct drive shafting system model showing the various componentwhich will serve as an effective teaching aid.

1.5.Significance of the project

Theshafting system of a ship is a very important part of the ship machinery.
Thisproject will provide a better understanding of the principle of operation ofthe shafting system and proffer methods to increase its overall efficiency.

1.6.Scope of the project

Thisproject will focus on the design analysis and construction of the ship shaftingas well as proffer ways to improve the efficiency and reduce energy lossesassociated with the shafting system.

1.7.Project structure

Theproject is structured so as to present it in a coherent and logical manner. Thefollowing provides a description of each of the chapters within this document:
Chapter1 presents the introduction to the project which encompasses thebackground study, the problemdefinition, and the aims/objectives of the project. It also includes thesignificance of the project and its scope.
Chapter2 provides a literature review of the project. Focus on existing direct driveshafting in the world history, principles used and usage. Also includes all theresearch that has been done to provide ideas and specification as a guidelineto produce the design.
Chapter3 describes the experimental setup and methods used to design and construct thedirect drive shafting system, focusing on proposed design process, productdesign specification concept Measurement and Evaluation, and provides arecommendation and conclusion.
Chapter4 of these project gives description of tests carried out on the shaftingsystem and provides the results of these test in accordance to the parametersand theories been used. Hence there shall be a discussion of the end result ofthese project and its viability.
Chapter5 will hence be the conclusion of these project as well as analyzing thelimitation and making necessary recommendation pertaining to these projectwork.

Design and fabrication of marine shafting system

The complete project material is available and ready for download. All what you need to do is to order for the complete material. The price for the material is NGN 3,000.00.
Make payment via bank transfer to Bank: Guaranteed Trust Bank, Account name: Emi-Aware technology, Account Number: 0424875728

Bank: Zenith Bank, Account name: Emi-Aware technology, Account Number: 1222004869

or visit the website and pay online. For more info: Visit https://researchcub.info/payment-instruct.html
After payment send your depositor's name, amount paid, project topic, email address or your phone number (in which instructions will sent to you to download the material) to +234 70 6329 8784 via text message/ whatsapp or Email address: info@allprojectmaterials.com.
Once payment is confirmed, the material will be sent to you immediately.

It takes 5min to 30min to confirm and send the material to you.
For more project topics and materials visit: https://researchcub.info/ or For enquries: info@allprojectmaterials.com or call/whatsapp: +234 70 6329 8784
Regards!!!