OCCUPATIONAL ANALYSIS

MARINE ENGINEERING INDUSTRY

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ABSTRACT

An Occupational Analysis (OA) is the process of identifying the work scope of the occupational area in terms of competencies. It is used to analyse skilled human resource competency requirement for the industry. The development of the Occupational Structure is a preliminary process in developing relevant National Occupational Skills Standard (NOSS). The NOSS in turn will be developed to be used as the basis to conduct skills training and certification of competent personnel. This document is divided into several chapters, the first being an industrial overview highlighting the definition and scope of the industry, the current analysis of the local industry and its skilled worker requirements, Government bodies and development plans supporting the growth of the industry, then the next chapter will explain the methodology used in Occupational Analysis development such as qualitative analysis through brainstorming discussion sessions and the formulation of the Occupational Description. Workshops were held to get a better understanding of the organisational structure, job titles, hierarchy objectives and main activities of the specified positions. The final chapters will present the findings of the Occupational Analysis that is translated into the Occupational Structures, levels of competencies and critical areas. These findings will in turn be the basis of reference for the development of the National Occupational Skills Standard (NOSS) document. The NOSS will serve not only as a reference of skills standards for certification but also as a guide to develop the skills training curriculum. In order to conduct the Occupational Analysis on the Marine Engineering Industry, all the information related to the aforesaid industry was gathered through literature survey and further discussed in workshop sessions with experts from the industry. During the development workshops, the panel members had identified four sub sectors, 13 job areas and a total of 165 job titles that reflect the main category of Marine Engineering in Malaysia. The four Marine Engineering sub sectors are such as Ship Building & Ship Repairing, Offshore Fabrication & Installation, Ship & Offshore Designing and Ship Board Operation. In Malaysia, this sector has great employment opportunities. Furthermore, with strong support from the government and private sectors, these areas could expand further in the future.

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LIST OF ABBREVIATIONS

AMIM	Association of Marine Industries of Malaysia
DESCUM	Development of Standard and Curriculum
DSD	Department of Skill Development
ETP	Economic Transformation Programme
EU	European Union
GDP	Gross Domestic Product
IACS	International Association of Classification Societies
IMO	International Marine Organisation
MARDEP	Marine Department of Malaysia
MARPOL	Prevention of Pollution from Ships
MMEA	Malaysian Maritime Enforcement Agency
MOSQF	Malaysian Occupational Skills Qualification Framework
MOT	Ministry of Transport
MQA	Malaysia Qualification Agency
MSC	Malaysian Skills Certificate
NOSS	National Occupational Skills Standard
OA	Occupational Analysis
OAA	Occupational Area Analysis
OAS	Occupational Area Structure
OD	Occupational Description
OS	Occupational Structure
OSHA	Occupational Safety and Health Act
SOLAS	Safety of Life at Sea
STCW	Standard of Training, Certification & Watchkeeping

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1. INTRODUCTION

1.1 INTRODUCTION

This chapter will explain the objectives, scope and problem statement of the Occupational Analysis for the Marine Engineering Industry. The background of Occupational Analysis and its function in skills training and curriculum development is also elaborated in this chapter.

1.1.1 INTRODUCTION TO OCCUPATIONAL ANALYSIS DEVELOPMENT

An Occupational Analysis (OA) is the process of identifying the sectors, sub-sectors, job areas and job titles for a particular industry in the form of Occupational Structure (OS). The Occupational Analysis (OA) will also look at other elements such as common job titles and levels of competency for skilled personnel in the industry, job functions, industry overview, skills demand and individual job descriptions. Job scopes of each job title will be detailed out in the Occupational Description (OD).

Every job title will be identified according to its level as defined in the Malaysian Occupational Skills Qualification Framework (MOSQF) level descriptor (refer to Annex 1). It must be highlighted that the Occupational Structure should not reflect the Organisational Structure but rather the competency levels and possible career path for personnel under a particular sector in the industry.

The OA requires input from all parties especially industry players, statutory bodies, training institutions among others. The identified job titles obtained during the OA will be used as reference during National Occupational Skills Standard (NOSS) development. By developing the NOSS, personnel in the industry can be deemed certified by undergoing three methods of skills training certification.

The first of the three methods are certification through full time training where the candidate will undergo training from a minimum of 3 months for entry level certificates (Malaysia Skills Certificate 1, 2 and 3) or up until over a year for Malaysian Skills Diploma or Advanced Diploma. The second method is via the apprenticeship scheme which is called the National Dual Training System (NDTS) where the candidate can undergo training for a certain block of time then be attached to a company in the related industry as approved by the Department of Skills Development, Ministry of Human Resources. The third method is via Accreditation of Prior Experience where the candidates that possess working experience may be able to be certified based on duration of experience and proof of work.

The Department of Skills Development (DSD) formerly known as the National Vocational Training Council under the Ministry of Human Resources coordinates the setting up of all public and private training institutions, evaluates the demand for existing and future skills, identifies future vocational and industrial training needs and will continue to develop standards under the National Occupational Skills Standards (NOSS).

Therefore, it can be said that with the development of the OA and subsequently the relevant NOSS will provide wider opportunities for personnel to be trained and certified. Figure 1.0 shows the significance of the Occupational Analysis (OA) for policy and NOSS development used in Malaysian skills training.

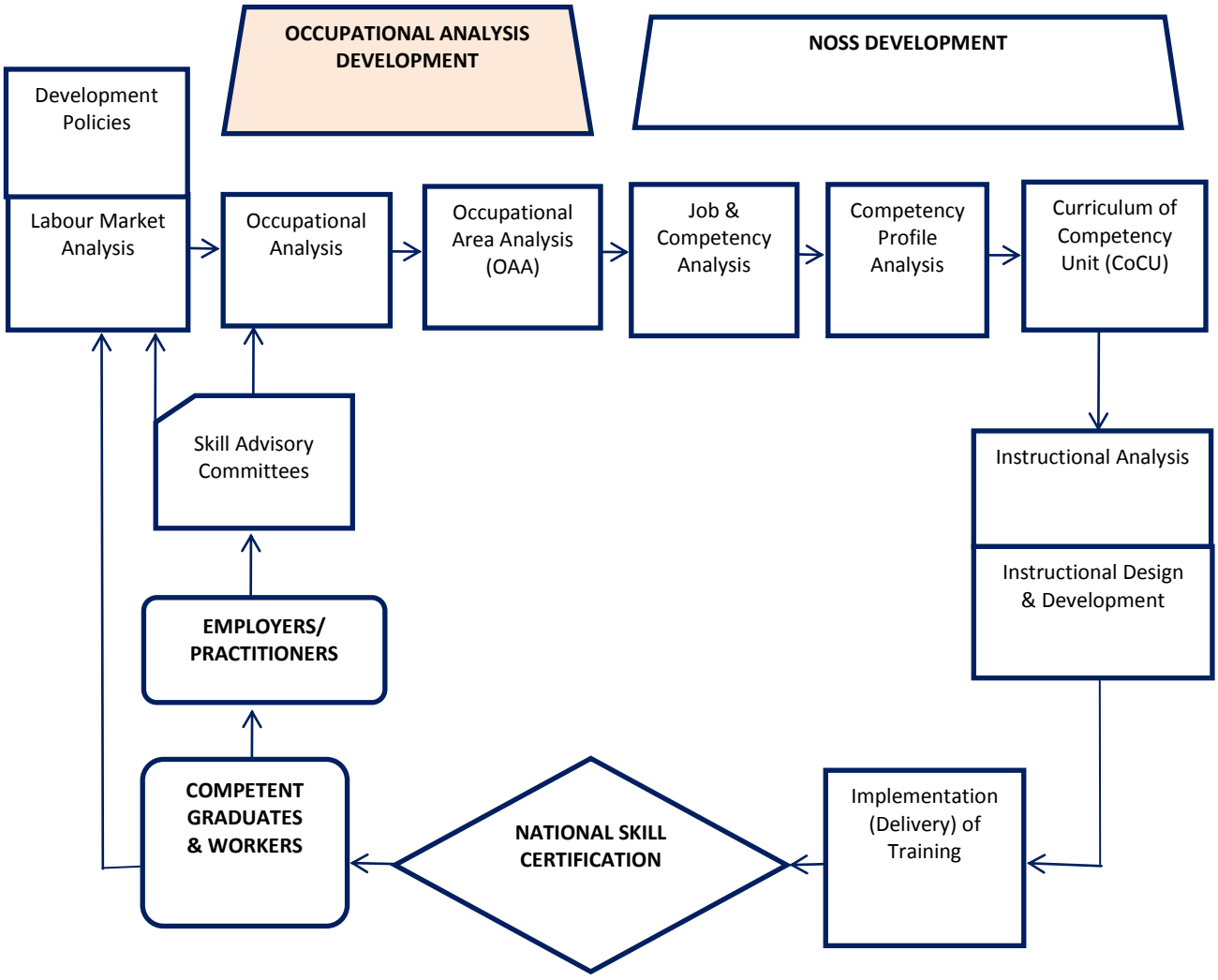

Figure 1.0 : A Competency Based Model for Skills Training in Malaysia

1.1.2 MALAYSIAN OCCUPATIONAL SKILLS QUALIFICATION FRAMEWORK (MOSQF)

The development of the OA is ensured to comply with the MOSQF. MOSQF is a framework that describes all skills qualifications awarded under the Malaysian Skills Certification System. It is an 8-tier framework that consists of 8 levels which reflect skills competencies in an occupational area (refer to Annex 1). However, for training purposes, only the first 5 levels are being offered with skills qualifications namely Malaysian Skills Certificate (MSC) Level 1, MSC Level 2, MSC Level 3, Malaysian Skills Diploma (MSD) Level 4 and Malaysian Skills Advance Diploma (MSAD) Level 5. MOSQF will serve as an instrument that develops and classifies skills qualifications based on a set of criteria guided by the National Skills Development Act 2006 (Act 652). It was benchmarked against international good practices in defining its level description and was developed in line with the Malaysian Qualifications Framework (MQF). It is aspired to become the national skills framework for all parties of interest such as individuals, skills training providers, the Government, associations, professional bodies, the industry sectors and the Malaysian communities.

1.2 OBJECTIVES

The objectives of this Occupational Analysis are to:

i. Identify the Occupational Structure and job titles available in the Marine Engineering Industry
ii. Identify the levels of competency required beginning at the entry levels until the highest level of competency
iii. Identify the job scope, job area and role of each job title identified including the possibility of multi skilling between different areas as to increase employability
iv. Identify the specific job titles that are considered critical and require immediate development of Standards & Curriculum

1.3 SCOPE

The scope of this particular OA is focused on the Marine Engineering Industry and all areas that are defined to be under the Marine Engineering Industry.

The Occupational Analysis on the Marine Engineering Industry will cover the scope of:

i. Occupational Structures;

ii. Occupational Area Analysis; and

iii. Job Descriptions.

1.4 PROBLEM STATEMENT, ISSUES AND CHALLENGES

There have been various National Occupational Skills Standard (NOSS) documents developed for the Marine Engineering Industry covering areas of Marine Electrical Maintenance and Technical Management, Marine Mechanical Engineering Maintenance and Technical Management, Marine Hull Construction and Marine Electronics Maintenance and Technical Management (Details of the existing NOSS relevant to the Marine Engineering Industry are included in Chapter 2).

However, a complete analysis on the Occupational Structure of the Marine Engineering Industry has not been undertaken before this. Marine engineering is the discipline of applying engineering sciences, mostly naval architecture, mechanical and electrical engineering, to the development, design, operation and maintenance of watercraft propulsion and on-board systems. Therefore, in order to identify the overall structure and available career paths in the industry, the Occupational Analysis must be done on the Marine Engineering Industry.

1.5 CONCLUSION

In the light of recent economic development in the Marine Engineering Industry, the demand for sufficient skilled personnel has increased and the development of skilled manpower is timely. By going through the mechanism provided by the Skills Training system in Malaysia, one of the important steps is to identify the Occupational Structure of the Marine Engineering Industry. With the Occupational Structure clearly defined, the industry stakeholders will be able to identify areas that will require more intensive efforts in human capital development. Although there have been past efforts in National Standards Development for the industry, the need for an Occupational Analysis is required to determine the overall areas that may not yet have been focused on. We can assume that the Occupational Analysis to be a 'blueprint' of the manpower planning for the Marine Engineering Industry.

2. LITERATURE REVIEW

2.1 INTRODUCTION

This chapter will focus on the explanation of the Marine Engineering Industry, the current scenario in Malaysia, introduction to government policies, development plans, government bodies and industrial competitiveness at the international level pertaining to the Marine Engineering Industry. Findings in this chapter were obtained via literature review, observation, interviews with industry practitioners and discussions during workshops with development panel members. This literature review will be further discussed with panel members to obtain insight on the matters at hand from a practitioner's perspective.

2.1.1 DESCRIPITION OF MARINE ENGINEERING INDUSTRY

Marine engineering broadly refers to the engineering of boats, ships, Mobile Offshore Drilling Unit (MODU) and any other marine vessel or floating structure. Specifically, marine engineering is the discipline of applying engineering sciences, mostly naval architecture, mechanical and electrical engineering, to the development, design, operation and maintenance of watercraft structure (hull) propulsion and on-board systems; e.g. power and propulsion plants, machinery, piping, automation and control systems etc. for marine vehicles of any kind like surface ships, submarines etc. Not all of marine engineering is concerned with moving vessels. Offshore construction, also called offshore engineering, ocean engineering or maritime engineering, is concerned with the technical design of fixed and floating marine structures, such as oil platforms and offshore wind farms. The term Marine Engineering can also be defined broadly to include all enterprises engaged in the business of designing, constructing, manufacturing, acquiring, operating, supplying, repairing and/or maintaining vessels, or component parts there of: of managing

and/or operating shipping lines, shipyards, dry docks, marine repair shops, shipping and similar enterprises. Marine engineering will deal with the engineering design work for any kind of maritime vessel or ocean-based structure that would cover anything from offshore vessels to super yachts and Mobile Offshore Drilling Unit (MODU).

The Marine Engineering Industry is defined into 4 main sub sectors which are:

i. Ship Building and Ship Repairing
ii. Offshore Fabrication and Installation
iii. Ship and Offshore Designing
iv. Ship Board Operation

The Ship Building / Ship Repair Industry as addressed in the Third Industrial Master Plan (IMP3), is part and parcel of the marine transport sub-sector of the larger transport equipment industry. [1] Structurally, the ship building/ship repair industry serves the shipping Industry in terms of building and supplying new vessels and maintaining existing vessels operated or owned by ship owners. Ship Design activities are high income activities and will contribute positively towards creating a high income nation with the establishment of a big pool of designers. The realisation of local design capabilities will support the Ship Building and Ship Repair sector to meet the target in year 2020, of capturing 80 % of local new built market and 2 % of global new built market.

2.2 EXISTING NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS)

In order to analyse the industry, the existing National Occupational Skills Standard (NOSS) and Occupational Structure documents were referred. In the DSD's NOSS

[1] Malaysian Shipbuilding/Ship Repair Industry Strategic Plan 2020.MIGHT.AMIM.

Registry, the existing OA Matrices can be seen in the following figures included in this section.

Table 1.0 : NOSS Relevant to Marine Engineering Industry

(Source : DSD NOSS Registry July 2013)

Level	Mechanical	Electrical	Electronic	Hull	Boat Making – Fiber Glass
L5	**TP-021-5 : 2012** *Marine Mechanical Operation & Maintenance* (18.12.2012)	**TP-020-5 : 2012** *Marine Electrical Operation & Maintenance* (18.12.2012)	**TP-023-3 : 2012** *Marine Electronic Operation & Maintenance* (18.12.2012)	**TP-024-5 : 2012** *Ship Hull Construction Management* (18.12.2012)	*(Not Available)*
L4	**TP-021-4 : 2012** *Marine Mechanical Operation, Maintenance*& Administration (18.12.2012)	**TP-020-4 : 2012** *Marine Electrical Operation, Maintenance*& Administration (18.12.2012)	**TP-023-4 : 2012** *Marine Electronic Operation, Maintenance* & Administration (18.12.2012)	**TP-024-4 : 2012** *Ship Hull Construction Coordination* (18.12.2012)	*(Not Available)*
L3	**TP-021-3** *Marine Technician (Mechanical)* (04.04.1997) (24.03.2009)	**TP-020-3** *Marine Senior Electrician* (23.12.1997) (18.11.2008)	**TP-023-3** *Marine Electronic Senior Technician* (02.04.1998) (01.10.2009)	**TP-024-3** *Marine Hull Senior Technician* (16.07.1998) (01.10.2009)	**TP-022-3** *Fiberglass Hull and Superstructure Builder Supervisor* (25.04.2005) (24.03.2009)
L2	**TP-021-2** *Marine Mechanic (Mechanical)* (04.04.1997) (24.03.2009)	**TP-020-2** *Marine Electrician* (23.12.1997) (18.11.2008)	**TP-023-2** *Marine Electronic Technician* (02.04.1998) (01.10.2009)	**TP-024-2** *Marine Hull Technician* (16.07.1998) (01.10.2009)	**TP-022-2** *Senior Fiberglass Hull and Superstructure Builder* (25.04.2005) (24.03.2009)
L1	**TP-021-1** *Marine Junior Mechanic (Mechanical)* (04.04.1997) (24.03.2009)	**R-010-1** *Marine Mechanic* (19.07.1996)			**TP-022-1** *Fiberglass Hull and Superstructure Builder* (25.04.2005) (24.03.2009)

Table 2.0 : NOSS Relevant to Marine Engineering Industry

(Source : DSD NOSS Registry July 2013)

Level	*Deck*		
	Less than 500 GT	**500 – 3000 GT**	***More than 3000 GT***
L5	*(Not Available)*	**TP-025 – 2 : 2012** *Navigational and Shipboard Operation* (05.04.2012)	
L4	**TP-025 – 4 : 2012** *Navigational Watchkeeping and Cargo Operation* (05.04.2012)		
L3	**TP-025 – 3 : 2012** *Navigational Watchkeeping and Deck Operation* (05.04.2012)		
L2	**TP-025 – 2 : 2012** *Navigational Lookout and Deck Operation* (05.04.2012)		
L1	**TP-025 – 1 : 2012** *Deck Operation* (05.04.2012)		

Table 3.0 : NOSS Relevant to Marine Engineering Industry

(Source : DSD NOSS Registry July 2013)

Level	***Port Operation***	***Bunkering Service***
L5	*(Not Available)*	
L4		
L3	**TP-200-3** *Port Supervisor* (10.12.2010)	**TP-032-3 : 2012** *Bunker Operation* (18.12.2012)
L2	**TP-200-2** *Port Operation Assistant* (10.12.2010)	**TP-032-2 : 2012** *Bunker Operation* (18.12.2012)
L1	**TP-200-1** *Port Stevedore* (10.12.2010)	**TP-032-1 : 2012** *Bunker Operation* (18.12.2012)

2.3 CURRENT ANALYSIS, INDUSTRIAL DEMAND AND STATISTIC

Marine industries in this country had been established since the past many decades. The industries vary from boats, ships and offshore platforms design, construction, operation, maintenance, and repair to manufacturing of parts and equipment as well as in oil and gas exploration and production. [2]

Malaysia has what it takes to emerge as a serious player in the maritime industry which includes shipbuilding, ship repairing, and maritime support services. Blessed with favourable maritime features including being located along critical and busy sea lanes, Malaysia has many advantages that can be harnessed to elevate the nation's competitiveness and stature among key maritime nations. [3]

Malaysia faces several constraints and challenges in the Marine Engineering Industry. Among them are the strong competition from yards in other countries, rising cost of raw materials, shortage of skilled labour among locals, excess capacity of yards and high reliance on labour intensive activities. Partly because of these challenges, Malaysian yards are not capable of building large sophisticated ocean going vessels which leading shipbuilding nations like South Korea, Japan and China are renowned for. As a result, local ship owners still depend on foreign yards for building, servicing and repairing their vessels. This reliance on foreign made vessels and of the services of yards abroad leads to foreign exchange outflow and contributes to the current account deficit of the country. [4]

Malaysia has many advantages and features that can be leveraged upon to make it an internationally competitive shipbuilding and ship repairing nation. These include excellent location along busy shipping routes, pro-business policies, and good

[2]Malaysian Marine Industries Perspective. University Kuala Lumpur. Malaysian Institute of Marine Technology
[3] Malaysia Shipbuilding/Ship Repair Industry Report 2013/2014
[4]2nd National Marine Industries Forum 2012.Realising Ship Building/Ship Repair Industry Strategic Plan 2020.

institutional framework, favourable maritime features for shipyard activities and good infrastructure and many others.

In 2011, the Ship Building and Ship Repair Industry generated RM 7.05 billion in revenue, provided more than 30,000 jobs and attracted investments worth RM6 billion approved by MITI.

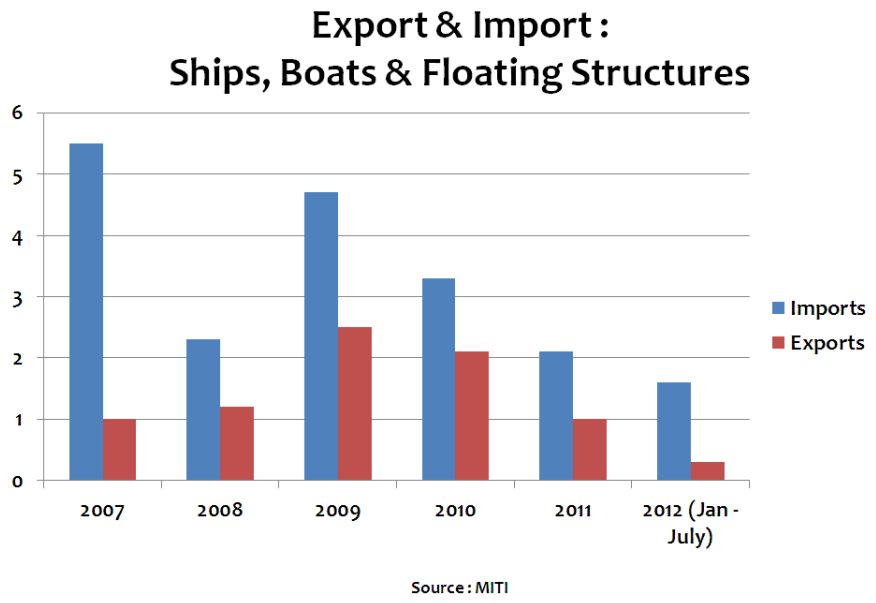

Figure2.0: Export and Import of Ships, Boats and Floating Structures

(Source : Ministry of International Trade and Investment – MITI)

Malaysia is poised to be one of the major ship building nations in the region with close to 55,500 jobs opening up by 2020 and plans to capture almost 80% of the local shipbuilding market by 2020. The country enjoys certain strengths such as its strategic location, serving as a strong logistics hub in the region, financial stability and a skilled workforce. However, certain weaknesses also include lack of government involvement, lack of modular technology and marketing presence. As part of its growth strategy, Malaysia plans to focus on building small/medium size vessels of up to 30,000 tonnes rather than large container vessels.

2.3.1 MARINE ENGINEERING INDUSTRY SKILLS DEMAND IN MALAYSIA

The marine industry is not only a conduit to Malaysia's trade but is also an important source of employment. Various activities in the industry provide a platform for the development of skills in a wide range of areas such as naval architecture, engineering and fabrication.

There are five (5) capital shipyards which could handle work scopes on construction, maintenance and repair of ships ranging from 300 up to 400,000 tonnes deadweight and eighteen (18) medium and small size shipyards handling the same work scopes for ships ranging from the smallest size of boats to the medium size of ships of up to 300 tonnes deadweight which are accounted for in Malaysia. These shipyards are linked to networks of vendors, suppliers and original manufactures of the associated materials, parts and equipment in the country and abroad which provide the integrated technical and the logistic supports to the industries. These shipyards take work orders from clients within the country and also from overseas. There are other numerous unaccounted small yards and traditional boat builders operating along many rivers and coastal towns in the West Peninsular and East Malaysia serving individual boat owners, fishermen and petty boat operators. General survey carried out shows that an average of up to 500 engineers and skilled technicians which are categorised as engineering professionals and semi-professionals are employed by every capital shipyard. Each of the medium and small size shipyards employs an average of up to 50 engineers and skilled technicians. Therefore a rough figure of more than 4000 engineering professionals and semi-professionals are employed in Malaysian shipyards. [5]

Statistic figures obtained from the Malaysian Shipowners Association (MASA) excluding government agencies show a fleet strength of 589 vessels owned by the

[5]Malaysian Marine Industries Perspective.University Kuala Lumpur. Malaysian Institute of Marine Technology

members, with a total capacity of about 10 million tonnes deadweight and nearly 7 million gross tonnages. With an average of up to 10 competent engineers and engineering ratings employed per vessel, the total employment of professionals and semi-professionals in seagoing ship operation by Malaysian ship owners is in the region of 6,000 employees. However, due to lack of interest by Malaysian general public despite attractive incentives offered by the government, almost 90% of the job opportunities in the seagoing ship operation of Malaysian ships are grabbed by foreign nationals.

It is estimated that about 5000 engineering professionals and semi-professionals ashore (50% of the total employment in shipyards and ships operation) are involved in the networks of vendors, suppliers, manufacturers and original equipment manufacturers which provide the integrated technical and the logistic supports to the marine industries in Malaysia.

A total of about 480 ships and boats of various sizes are owned by the various government agencies including the Royal Malaysian Navy, Marine Police, Fishery Department, Royal Custom and Excise, Port Authorities and the Maritime Enforcement Authority. With an average of 15 shipboard and shore support engineering personnel employed per ship, a total of more than 7000 engineering professionals and semi-professionals are engaged in the employment by the various government agencies. [6]

In all, from the above statistics a total of about 22,000 engineering professionals and semi-professional are currently employed in the marine and the related industries in Malaysia excluding in the oil and gas exploration and production sector. Allowing for a pessimistic growth of 8% to 10% inclusive of vacancies created due to workforce retirement and migration to other industries in every five years ahead, a total of

[6]Malaysian Marine Industries Perspective.University Kuala Lumpur. Malaysian Institute of Marine Technology

more than 2000 professionals and semi-professionals are necessary to be produced to meet the demand of the marine and the related industries in Malaysia. However the actual demand in every five-year period ahead are expected to be more taking into account of those intending to become individual technical entrepreneurs, taking employment overseas and meeting the demand in the oil and gas industries.

The Government of Malaysia seeks to strengthen the capacity and the capability of the shipbuilding and repair sector under the Third Industrial Master Plan (IMP3) from 2006 to 2020. This is necessary as to reduce the outflow of capital for the acquisition of marine transport products, especially ships. The push to the shipbuilding and repair sector is amongst the strategic thrusts for the long-term growth and viability of the marine transport sector. The country imported passenger ships, LNG ships, LPG ships, container ships, oil tankers, general cargo ships, barges and others. Many shipping companies also leased or chartered the various types of vessel from abroad as to cater the additional requirements to transport their commodities or goods out of and into the country.

Malaysia is in dire need of professionals in the fields of relevant specialisation to cater to the above industrial perspective. There is a shortage of shipyards in this country that are fully capable in the entire development of ship design, be it for merchant or naval vessels. This is one of the major reasons why our shipbuilding industry lags behind China, Korea and Japan.

The full capability and capacity in ship design are necessary to be built up. The Malaysian shipyards seemed to be more comfortable engaging foreign ship design consultants than building own capability and capacity. Most Malaysian ship owners prefer their vessels to be designed by foreign ship design consultants and constructed at shipyards overseas. The present limited capability and capacity in the fields of ship design and construction or shipbuilding needs to be enhanced as to ensure a long

term sustainability and competitiveness. In order to support and materialise the national industrial perspective in the marine transport sector, sufficient number of professionals in the combined fields of specialisation (naval architecture and shipbuilding) and others are necessary to be produced. It is timely to train and develop technical entrepreneurs in the combined specialisation of Naval Architecture, Shipbuilding, Marine Engineering, Subsea Engineering and Marine Electrical and Electronics to be able to participate in the relevant activities of the marine industries.

Out of the 30,000 strong workforces currently serving the industry, the blue collar skilled workers and technicians represent the majority of the workforce. In order to achieve the targets set for year 2020, it is necessary to fulfil the human capital demand of the industry which is estimated that by 2020, an approximately 1,300 marine engineers and 2,300 technicians and mechanics specialising in aluminium and steel welding and carpentry are required.

To fulfil the demand of workers in the Marine Industry, the role of training providers to produce highly skilled workers are crucial. Currently there are various local training institutions and universities that offer marine engineering courses, such as University Technology Malaysia (UTM), *University Pertahanan Malaysia, Akademi Laut Malaysia* (ALAM), Ungku Omar Polytechnic, Universiti Kuala Lumpur Malaysian Institute of Marine Engineering Technology (UniKL MIMET), Sarawak Maritime Academy and Ranaco Marine. [7]

However, with the development of this Occupational Analysis, various National Occupational Skills Standards can be developed that can pave the way to the establishment of more skills training centres under the Department of Skills Development offering courses in marine engineering.

[7]Malaysia Shipbuilding/Ship Repair Industry Strategic Plan 2013/2014

2.4 INTERNATIONAL BENCHMARKING

A "benchmark" is a comparative tool of measurement. It is a standard or point of reference used in measuring and judging quality or value. "Benchmarking" is the process of comparison. The process of continuously comparing and measuring an organisation against business leaders anywhere in the world to gain information that will help the organization take action to improve its performance. In practice it is the *process* of undertaking benchmarking that generates most benefits because it challenges current norms. Benchmarking data can be obtained from international, regional, and national sources. International organisations are one source of benchmarking data, and increasingly make information available for online access through the Internet. The three countries that have been referenced to in this study are China, South Korea and Singapore. The figure below shows the countries (China & South Korea) contribution to the global shipbuilding industry.

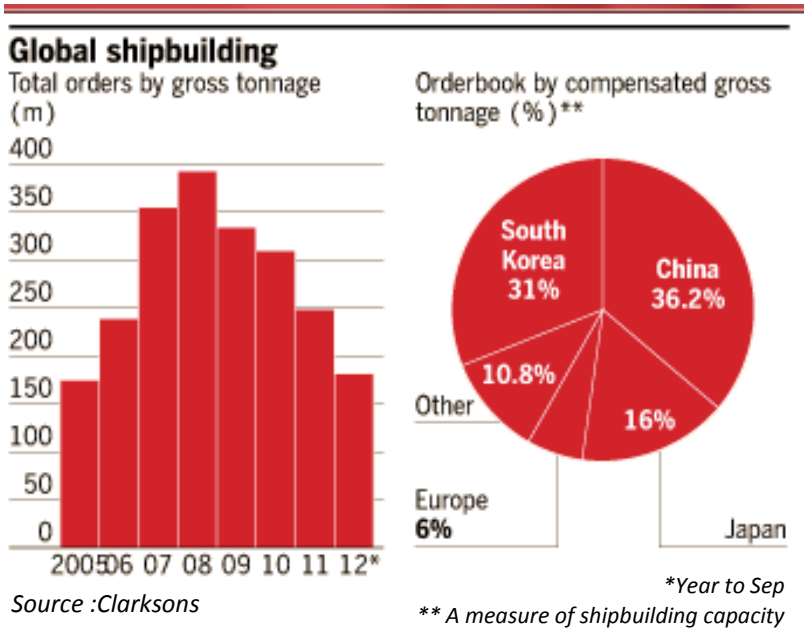

Figure 3.0 : Global Shipbuilding Total Orders by Gross Tonnage

Source (Secondary Source): Financial Times.com. Korean Shipbuilding Industry

China is making a concerted effort to establish itself as a major maritime power. It is now the world's largest shipbuilder in terms of gross tonnage, followed by South Korea and then Japan. The high volume of these three Asian countries comes from commercial, not naval (military), construction. Commercial shipbuilding has, however, always been considered a strategic industry, and not only because its infrastructure can also support warship construction. The Chinese-flag merchant fleet numbers more than 1,500 ships, over 700 of which have a displacement over 10,000 deadweight tons. A study of the Chinese shipbuilding industry by the European Commission found that Beijing has managed to expand its share of world shipbuilding to 7 percent.

The South Korean ship building industry is recognised as the best in the world, producing 350 commercial and military vessels per year, these range from VLCC tankers (385 meters in length) LNG, LPG, car carriers (7000 cars) and container vessels.

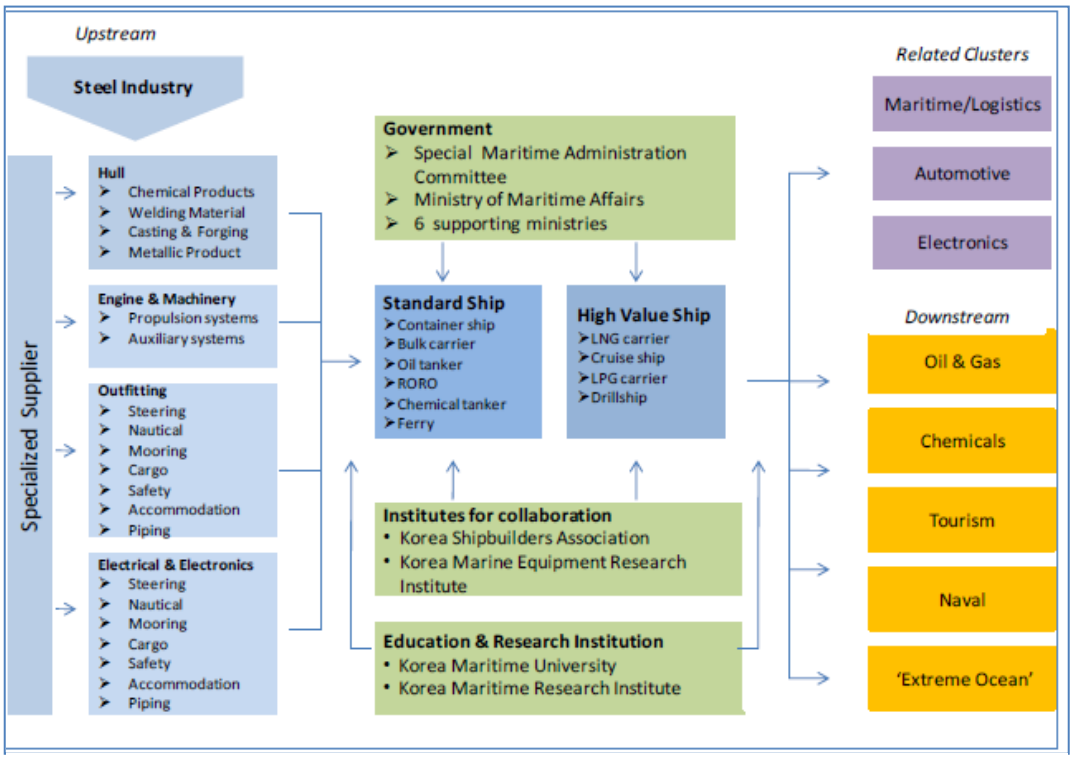

Figure 4.0 : Korea Ship Building Strategic Industry Infrastructure

Source (Secondary Source): Financial Times.com. Korean Shipbuilding Industry

Based on a Harvard Business School Study, the above segregation of areas or clusters shows a rough segmentation of the marine industry in South Korea. The steel industry plays a key role in raw material supply to the shipbuilding industry and its specialised suppliers.

The cluster is also supported by a large ecosystem of specialised suppliers producing shipbuilding related components (Hull, Engine, Machinery and Electronics components) as well as Outfitting services. South Korea completely depends on imports for oil consumption, and re-exports about a quarter of its gross oil imports as refined petroleum products, mostly to neighboring countries. The tourism sector utilises the ferry boat products produced by the cluster for purposes of domestic travel for mainland to island routes. Several key educational and research institution supporting the cluster including the Korea Maritime University (Busan) and the Korea Marine Equipment Research Institute (KOMERI) are located within the Gyeongnam region itself.

The cluster also benefits from supply of Engineers from Seoul National University and Korea Advanced Institute of Science & Technology (KAIST), as well as skilled workers from vocational institutions such Ulsan Polytechnic College and Changwon Polytechnic College. KOSHIPA is the leading shipbuilding association enhancing cooperation amongst members and promoting their common interests, with membership covering all major shipbuilders. Other key shipbuilding industry associations include Korea Marine Equipment Association (KOMEA) and the Korea Shipbuilding Industry Cooperative (KOSIC).

Singapore is the largest manufacturer of jack-up rigs, and commands 70 per cent of the world market. It also has 70 percent of the global market for the conversion of Floating Production Storage Offloading units. Towards meeting future demand for energy, offshore deep-water along with unconventional oil & gas exploration and

production activities will increase, to address the shortfall in conventional onshore oil & gas resources worldwide. More sophisticated products and technologies will be required to enable this new play in oil & gas exploration. For example, drilling rigs operating in the North Sea need to be designed for harsh environment and need to meet stringent specifications. The marine and offshore industry is on a roll, buoyed by high oil and gas prices and an ageing offshore fleet. Singapore has been a big beneficiary of the boom, having carved a reputation for consistent high quality and timely delivery. An expert cluster of marine-related service companies such as those providing classification services, maritime law and insurance services, and offshore support services has developed in Singapore. The industry also reaps significant gains from the country's robust and dynamic supply chain and precision engineering infrastructure. In 2011, total output from the marine and offshore industry grew to S$12.9 billion. Technology is a key driver for the marine engineering sector. To stay at the leading edge of the industry, Singapore actively promotes R&D collaboration between its educational institutions and the private sector. Key initiatives include the Centre for Offshore Research & Engineering and Centre of Innovation – Marine & Offshore Technology. Additionally, both the Marine Centre of Innovation @ Singapore Polytechnic and Maritime Research Centre @ NTU work closely with local yards, such as Keppel, SembCorp, and ST Marine, to develop new capabilities. Singapore tertiary institutes have stepped up efforts to groom manpower for the sector.

Based on the three benchmark countries shown above it can be summarised that in order to develop a sustainable Marine Engineering Industry, there are several factors that are instrumental such as:

i. collaboration between the industry and academic/vocational institutions
ii. intensive research efforts on the design and technology used in the marine engineering field

iii. strong support from the government and association that maintain the interests of its members in the industry

Therefore, the development of Malaysia's Marine Engineering Industry Occupational framework is done with these international benchmarks in mind, but is specifically guided by the local Marine Engineering Industry and government human capital development plans.

2.5 STATUTORY & REGULATORY BODIES

i. Ministry of Transport

The Ministry of Transport is responsible to plan, devise and implement policies with regards to rail, maritime, aviation transportation and ports, implement physical development projects which involve rail, maritime, port and civil aviation infrastructure, determining the pricing policy (except for land commercial vehicles), monitoring of policies and concessionaire / government linked companies, Identifying and monitoring legal issues, service and safety standards and conduct regional and international cooperation programmes in the transport sector.

ii. Marine Department of Malaysia (MARDEP)

The Marine Department of Malaysia acts as the regulatory body which audits the respective training institutions and enforces the implementation of the correct training programme for ship hull construction coordination/ marine seafarers at those institutes. The role of MARDEP is to ensure that the study program is in line with the STCW 2010, requirements where the workshop facilities, teaching faculty members qualifications and the students' entry qualifications are in full compliance with the set standard.

In compliance to this training requirement the institute will be categorized in the International Marine Organisation (IMO) white list and its graduates will be accepted globally. Since Malaysia is one of the participating country and also a signatory to the STCW 2010 conference, the Acts will be enforced by MARDEP under the Port State Control provision. Other related Acts applicable include:

- Malaysian Shipping Ordinance 1952.
- Environmental Act 1976.
- Part of Petroleum Act 1984 (Safety Measures) and its regulations.
- Guidelines, codes of practice, circulars of OSHA, with regards to the respective acts, DOSH comes forward to apply the functions as stipulated

iii. Classification Societies

Classification societies set technical rules, confirm that designs and calculations meet these rules, survey ships and structures during the process of construction and commissioning, and periodically survey vessels to ensure that they continue to meet the rules. Classification societies are also responsible for classing oil platforms, other offshore structures, and submarines. This survey process covers diesel engines, important shipboard pumps and other vital machinery. Classification surveyors inspect ships to make sure that the ship, its components and machinery are built and maintained according to the standards required for their class.

Today there are a number of classification societies operating in Malaysia, the largest of which are the American Bureau of Shipping, Det Norske Veritas, Bureau Veritas and a locally founded one, Ships Classification Malaysia (SCM). Classification societies employ ship surveyors, material engineers, piping engineers, mechanical engineers, chemical engineers and electrical engineers, often located at ports and office buildings around the world.

In particular, classification societies may be authorised to inspect ships, oil rigs, submarines, and other marine structures and issue certificates on behalf of the state under whose flag the ships are registered. As well as providing classification and certification services, the larger societies also conduct research at their own research facilities in order to improve the effectiveness of their rules and to investigate the safety of new innovations in shipbuilding. There are more than 50 marine classification organisations worldwide, some of which are listed below.

Table 4.0 : List of Classification Societies

No.	Name	Abbreviations	Year Established	Head Office
1.	Lloyd's Register	LR	1760	London
2.	Bureau Veritas	BV	1828	Paris
3.	Registro Italiano Navale	RINA	1861	Genoa
4.	American Bureau of Shipping	ABS	1862	Houston
5.	Det Norske Veritas	DNV	1864	Oslo
6.	Germanischer Lloyd	GL	1867	Hamburg
7.	Nippon Kaiji Kyokai (Class NK)	NK	1899	Tokyo
8.	Russian Maritime Register of Shipping	RS	1913	Saint Petersburg
9.	Hellenic Register of Shipping	HR	1919	Piraeus
10.	Overseas Marine Certification Services	OMCS	2004	Panama
11.	Polish Register of Shipping	PRS	1936	Gdansk
12.	Croatian Register of Shipping	CRS	1949	Split
13.	Bulgarian Register of Shipping	BRS (БКР)	1950	Varna
14.	China Corporation Register of Shipping	CR	1951	Taipei
15.	China Classification Society	CCS	1956	Beijing
16.	Korean Register of Shipping	KR	1960	Busan
17.	Turk Loydu	TL	1962	Istanbul
18.	Biro Klasifikasi Indonesia	BKI	1964	Jakarta

Table 4.0 : List of Classification Societies (continue)

No.	Name	Abbreviations	Year Established	Head Office
19.	Indian Register of Shipping	IRS	1975	Mumbai
20.	International Naval Surveys Bureau	INSB	1977	Piraeus
21.	International Register of Shipping	IROS	1993	Miami
22.	Ships Classification Malaysia	SCM	1994	Shah Alam
23.	Isthmus Bureau of Shipping	IBS	1995	Panama
24.	Guardian Bureau of Shipping	GBS	1996	Syria
25.	Biro Klasifikasi Indonesia	BKI	1964	Jakarta
26.	Registro Internacional Naval	RINAVE	1973	Lisbon
27.	Brazilian Register of Shipping	RBNA	1982	Rio de Janeiro
28.	Shipping Register of Ukraine	RU (РУ)	1998	Kyiv
29.	Dromon Bureau of Shipping	DBS	2003	Limassol
30.	Intermaritime Certification Services	ICS Class	2005	Panama
31.	Iranian Classification Society	ICS	2007	Tehran
32.	Register of Shipping Albania	ARS	1970	Durres
33.	Venezuelan Register of Shipping	VRS	2008	London

iv. International Maritime Organisation (IMO)

The International Maritime Organisation is the United Nations specialised agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships. The Convention establishing the International Maritime Organisation (IMO) was adopted in Geneva in 1948 and IMO first met in 1959. IMO's main task has been to develop and maintain a comprehensive regulatory framework for shipping and its remit today includes safety, environmental concerns, legal matters, technical co-operation, maritime security and the efficiency of shipping. A specialised agency of the

United Nations with 169 Member States and three Associate Members, IMO is based in the United Kingdom with around 300 international staffs.

IMO's specialised committees and sub-committees are the focus for the technical work to update existing legislation or develop and adopt new regulations, with meetings attended by maritime experts from Member Governments, together with those from interested intergovernmental and non-governmental organisations.

The result is a comprehensive body of international conventions, supported by hundreds of recommendations governing every facet of shipping. There are, firstly, measures aimed at the prevention of accidents, including standards for ship design, construction, equipment, operation and manning - key treaties include SOLAS, the MARPOL convention for the prevention of pollution by ships and the STCW convention on standards of training for seafarers.

In 1948 an international conference in Geneva adopted a convention formally establishing IMO (the original name was the Inter-Governmental Maritime Consultative Organisation, or IMCO, but the name was changed in 1982 to IMO).

The purposes of the Organization, as summarised by Article 1(a) of the Convention, are "to provide machinery for cooperation among Governments in the field of governmental regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade; to encourage and facilitate the general adoption of the highest practicable standards in matters concerning maritime safety, efficiency of navigation and prevention and control of marine pollution from ships". The Organisation is also empowered to deal with administrative and legal matters related to these purposes.

On 1 February 1997, the 1995 amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 entered into force. They greatly improve seafarer standards and, for the first time, give IMO itself powers to check Government actions with Parties required to submit information to IMO regarding their compliance with the Convention. A major revision of the STCW Convention and Code was completed in 2010 with the adoption of the "Manila amendments to the STCW Convention and Code". As IMO instruments have entered into force and been implemented, developments in technology and/or lessons learned from accidents have led to changes and amendments being adopted. The focus on implementation continues, with the technical co-operation programme a key strand of IMO's work.

IMO's mission statement, as stated in Resolution A.1011(26), which sets out the Strategic plan for the Organization (for the six year period 2010 to 2015:
"The mission of the International Maritime Organization (IMO) as a United Nations specialised agency is to promote safe, secure, environmentally sound, efficient and sustainable shipping through cooperation. This will be accomplished by adopting the highest practicable standards of maritime safety and security, efficiency of navigation and prevention and control of pollution from ships, as well as through consideration of the related legal matters and effective implementation of IMO's instruments with a view to their universal and uniform application."

v. Malaysian Maritime Enforcement Agency (MMEA)

MMEA was formally established with the enactment of the Malaysian Maritime Enforcement Agency Act 2004. Subsequently, the Act was gazetted on 1 July 2004 and came into force on 15 February 2005. The agency achieved operational status on 30 November 2005 with a soft launch. MMEA was

officially launched by the Hon. Deputy Prime Minister of Malaysia on 21 March 2006.

MMEA'S Functions:

- To enforce law and order under any federal law;
- To perform maritime search and rescue;
- To prevent and suppress the commission of an offence;
- To lend assistance in any criminal matters on a request by a foreign State as provided under the Mutual Assistance in Criminal Matters Act 2002 (Act 621);
- To carry out air and coastal surveillance;
- To establish and manage maritime institutions for training;
- To ensure maritime security and safety;
- Perform any obligation to ensure maritime safety and security ;
- Control and prevention of maritime pollution in the seas;
- Prevent and suppress piracy and illicit trafficking of narcotic drugs on the high seas; and
- Placed under the control of the Malaysian Armed Forces during a period of emergency special crisis or war.

vi. Association of Marine Industries of Malaysia (AMIM)

The association was established on 14 March 1984 and was initially known as Association of Shipbuilders and Repairers of Malaysia (ASROM). The name was changed to Association of Marine Industries of Malaysia (AMIM) on 24 July 1997 with a view to broaden its membership and representative spectrum to include all aspects of marine industry activities in Malaysia.

The objectives of this Association are to:

- protect, safeguard, preserve and strive for the interest of its members to meet the growing demands of the industry and the aspiration of Malaysia to be a Maritime Nation;
- develop and improve the standard and technology by setting up standard in conformity with the global order and applying it to Malaysian Shipbuilding, Ship repair and general Marine industries;
- act as a mean of communication and forum for its members to interact contribute and consolidate their ideas and experience to improve the industry;
- act as a source of reference for Marine industries of Malaysia by providing information kiosk, directory and other services to promote and introduce the activities of its members;
- promote cooperation between its members and affiliated members with the objectives of forming a healthy working relations between parties and encourage the exchange of technologies as inspired by the national industrial policy;
- give assistance in the form of advice and references for expert advice on all matters relating to management of business and investments and also sponsor and promote research into areas affecting marine industries in Malaysia or any other act that the Association may think proper and desirable in the interest of the Association in line with any of its objective;
- promote and facilitate the pursuit of education and training in marine industries curriculum by sponsoring, introducing, advocating and subjects related to the industry and providing such facilities like scholarships and loans and to enable the pursuit locally or abroad of suitable candidates to ensure the continuity of the industry and its development;

- organise, sponsor and hold lectures, workshops, exhibition, visits, competition, trade discussion and representation locally and abroad on Marine industry activities in Malaysia;
- act as buffers and representative for its members in their relation with government agencies and other concerned groups to enable issue be collective and centralized to improve efficiency by eliminating repetition and deliberation;
- assist members in negotiations, meetings, discussions with other groups or agencies with the object of furthering the development of Marine industry in Malaysia;
- organise and manage matters of common interest, concern or benefit to members or any group of members and to collect and manage funds for the same;
- make by laws and regulations to govern the conduct and ethic of its members based on established customs and practices of marine businesses and having such mandate and authority to promulgate and enforce these rules and regulations against any members of the Association;
- make representation on behalf of its members at any forum for dispute settlements, negotiation, inquiries or forum at its sole discretion on all matters concerning marine industries and to employ, recommend and introduce professionals for the purpose of common good of the Association at its discretion without prejudice to any of its members;
- establish, maintain, rent, acquire or own property under the Association for the use of its members and engage in such social activities including meals and refreshment for its members;
- act as Arbitrators in any disputes of its members provided that such members have given their express consent in writing. Such Arbitration

shall always be subject to any written laws applicable at that time in Malaysia without prejudice to their legal rights thereof; and

- act as a catalyst and promote, introduce, assist and propose to the relevant Local, State or Federal government authorities or other law makers to review, revise, amend, append or introduce new legislation to the effect to improve the quality and quantity of marine industries in Malaysia;

AMIM is authorised and mandated to do all that is necessary to ensure the development, continuity and progression of its members in the industries and to do all that is in the best interest of its members and assist the government at realizing its aspiration.

2.6 RELATED POLICIES, ACTS, REGULATIONS AND STANDARDS FOR INDUSTRY

i. Standard of Training, Certification and Watch keeping (STCW 2010) - The 2010 Manila Conference

The Manila amendments to the International Convention on Standards of Training, Certification and Watch keeping for Seafarers, 1978 and to the Seafarers' Training, Certification and Watch keeping Code, as amended (STCW Convention and Code). Recognises the significant contribution made to seafarers' training and certification through model courses, validated and published by the International Maritime Organization (IMO) providing core curricula based on the minimum requirements of the STCW Convention and Code.

The STCW has assisted many training institutions to improve the quality of the training they provide and have been used to improve procedures for assessing competency by ensuring uniformity in the application of the training and assessment provisions of the STCW Convention and Code.

ii. International Convention for the Safety of Life at Sea (SOLAS), 1974

The SOLAS Convention in its successive forms is generally regarded as the most important of all international treaties concerning the safety of merchant ships. The first version was adopted in 1914, in response to the Titanic disaster, the second in 1929, the third in 1948, and the fourth in 1960. The 1974 version includes the tacit acceptance procedure - which provides that an amendment shall enter into force on a specified date unless, before that date, objections to the amendment are received from an agreed number of Parties.

As a result the 1974 Convention has been updated and amended on numerous occasions. The Convention in force today is sometimes referred to as SOLAS, 1974, as amended. The main objective of the SOLAS Convention is to specify minimum standards for the construction, equipment and operation of ships, compatible with their safety. Flag States are responsible for ensuring that ships under their flag comply with its requirements, and a number of certificates are prescribed in the Convention as proof that this has been done. Control provisions also allow Contracting Governments to inspect ships of other Contracting States if there are clear grounds for believing that the ship and its equipment do not substantially comply with the requirements of the Convention - this procedure is known as port State control.

iii. International Convention for the Prevention of Pollution from Ships (MARPOL)

The International Convention for the Prevention of Pollution from Ships (MARPOL) is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes.

The MARPOL Convention was adopted on 2 November 1973 at IMO. The Protocol of 1978 was adopted in response to a spate of tanker accidents in 1976-1977. As the 1973 MARPOL Convention had not yet entered into force, the 1978 MARPOL Protocol absorbed the parent Convention. The combined instrument entered into force on 2 October 1983. The Convention includes regulations aimed at preventing and minimising pollution from ships - both accidental pollution and that from routine operations.

iv. The Occupational Safety and Health Act (OSHA) 1994 - Act 415

The Occupational Safety and Health Act (OSHA) 1994 - Act 415 provides the legislative framework to promote, stimulate and encourage high standards of safety and health at work. The aim is to promote safety and health awareness, and establish effective safety organisation and performance through self-regulation schemes designed to suit the particular industry or organisation. The long-term goal of the Act is to create a healthy and safe working culture among all Malaysian employees and employers. *OSHA 1994 defines the general duties of employers, employees, the self-employed, designers, manufacturers, importers and suppliers of plant or substances.* Although these duties are of a general character, they carry a wide ranging set of responsibilities. The Act provides a comprehensive and integrated system of law to deal with the safety and health of virtually all people at work and the protection of the public where they may be affected by the activities of people at work.

The general duties of employers, employees, the self-employed, designers, manufacturers, importers and suppliers of plant or substances are clearly defined under OSHA 1994. Employers must safeguard so far as is practicable, the health, safety and welfare of the people who work for them. This applies in particular to the provision and maintenance of a safe plant and system of work. Arrangements must also be made to ensure safety and health in the use, handling, storage and transport of plant and substances. Under OSHA 1994, definition of 'plant' includes any machinery, equipment, appliance, tool and component, whilst 'substance' means any natural or artificial substance whether in solid, liquid, gas, vapour or combination thereof, form.

Processes that use hazardous chemicals require competent persons to conduct the air quality and personal monitoring, and a safety and health officer and an occupational health doctor are required to ensure the proper surveillance of the workplace.

There are seven regulations under OSHA 1994 that are enforced by DOSH, which are:

- Employers' Safety and Health General Policy Statements (Exception) Regulations, 1995
- Control of Industrial Major Accident Hazards Regulations, 1996
- Classification, Packaging and Labelling of Hazardous Chemicals Regulations, 1997
- Safety and Health Committee Regulations, 1996
- Safety and Health Officer Regulations, 1997
- Use and Standards of Exposure of Chemicals Hazardous to Health Regulations, 2000
- Notification of Accident, Dangerous Occurrence, Occupational Poisoning and Occupational Disease Regulations, 2004

v. Acts Listed By Ministry Of Transport Relevant To The Marine Engineering Industry

Below are lists of other Acts relevant to the marine engineering industry as listed by the Ministry of Transport Malaysia:

- Cargo Transport by Sea Act1950 [Act 527]
- Merchant Shipping Ordinance 1952 [Ord. 70/1952]
- Federal Fire Dues Act 1953 [Act 243]

- Penang Port Commission Act 1955 [Act 140]
- Port Authorities Act 1963 [Act 488]
- Bintulu Port Authority Act 1981 [Act 243]
- Privatization Port Act 1990 [Act 422]
- Langkawi International Yacht Registry Act 2003 [Act 630]
- Government Gazette
- Gazette On The Exemption Of Foreign Cruise Vessels From The Domestic Shipping License Requirement

vi. International Standard Related to Marine Engineering Industry

Below are examples of industry standards of Marine Engineering Industry

a) International Association of Classification Societies (IACS)
   - Shipbuilding & Repair Quality Standard (IACS Recommendation No. 47)

b) Classification Society Rules & Regulations
   - Bureau Veritas Rules for the Classification of Steel Ships (NR 467)
   - Bureau Veritas Rules for Naval Ships (NR 483)
   - Bureau Veritas Guidelines – Raw Materials for FRP Hull (Approval & Survey Program)
   - Bureau Veritas Rules & Regulations for the Classification of Ships – Hull Structure Design, Fibre Reinforced Plastic Ships (NR 220)
   - Bureau Veritas Rules for the Classification of Offshore Units (NR 445)
   - Bureau Veritas Survey of Materials and Equipment at Works for the Classification of Ships and Offshore Units (NR 266)
   - Bureau Veritas Rules On Materials and Welding for the Classification of Marine Units (NR 216)

2.7 CONCLUSION

It can be summarised in this chapter that the Malaysian Marine Engineering Industry has great potential. Malaysia has many advantages and features that can be leveraged upon to make it an internationally competitive shipbuilding and ship repairing nation. In order to support and materialise the national industrial perspective in the marine transport sector, a sufficient number of professionals are necessary to be produced. It is timely to train and develop technical personnel in order to achieve the targets set for year 2020, which is estimated that by 2020, an approximately 1,300 marine engineers and naval architects and more than 2,300 technicians and mechanics specialising in aluminium and steel welding and carpentry are required. By looking at the examples of benchmark countries such as Singapore, South Korea and China, research intensive activities that have served as an edge for these countries in terms of production and design can be enhanced with a tight collaboration between the government, the industry players, learning institutions and research institutions.

3. OCCUPATIONAL ANALYSIS METHODOLOGY

3.1 INTRODUCTION

This chapter describes the methodology of the overall Occupational Analysis process that was conducted throughout the Marine Engineering Industry Occupational Analysis.

3.2 OCCUPATIONAL ANALYSIS PROCESS

Below are the techniques used throughout the research conducted on the Insurance Industry:

(i) Preliminary information gathering

(a) Literature survey

A literature survey is carried out to get some insight on the scope, policies, programs and activities in the context of the Malaysian scenario. The scope covered under this survey includes descriptions, current analysis of the sectors/ Sub-Sectors, current status of the respective industry, skilled workers requirement in the local sector and the industrial competition at international level.

(b) Survey/Questionnaire

The purpose of the survey is to collect the data and feedback from the industries on the supply and demand on skilled workforce, job scope, nature of work, occupational description, occupational structure, career path, current and future trend of the industries.

(c) Interview

Interviews are one of the methods to reinforce the information gathered from the survey. The Interview focuses on the main industry players and stakeholders to seek their opinions and/or impressions.

(d) Identifying industrial experts

Industrial experts who represent small, medium and large scale industries are identified and short listed for further communication and contact. Normally these experts are from Human Resources or managerial levels that have an

overall view of the skilled workforce in the industry. They should have sufficient experience and substantial knowledge on industry growth.

(e) Brainstorming session

The Developing a Curriculum (DACUM) technique is commonly used in OA. The session is attended by industrial experts where they will discuss exhaustively on the Sub-Sectors and areas involved. The facts obtained during the literature survey will be discussed and presented to the industry experts.

(ii) Analysing the information

Based on the activities done above, substantial data and information will then be collected. The data and information will then be discussed and analysed in development workshops attended by selected key persons or experts from the public and private sector. The presence of the key persons or experts ensures that the development of the Occupational Analysis is current and relevant.

During this session, the respective industry is analysed using the DACUM/DESCUM and brainstorming methodology to identify the following:

(a) Scope of the Industry and its Sub-Sector ;
(b) Main areas;
(c) Occupational groups of the sector;
(d) Job title;
(e) Critical job title;
(f) Hierarchy structure (Level 1 – 8); and
(g) Occupational Description.

(iii) Development Workshop and interviews with development panel members

Workshops and interviews were conducted during the development of the Entertainment Industry Occupational Analysis. Follow up discussions with the expert panel members were done in smaller groups to verify the findings of the Occupational Analysis. The details of the workshop are as below:

Table 5.0: List of Occupational Analysis Development Session

Date	Venue	Activity
10th June 2013	Association of Marine Industries of Malaysia (AMIM) Menara Boustead, Jalan Raja Chulan, Kuala Lumpur	Occupational Structure Development Workshop
25th – 26th June 2013	Association of Marine Industries of Malaysia (AMIM) Menara Boustead, Jalan Raja Chulan, Kuala Lumpur	Occupational Description Development Workshop

(iv) Finalising OA Documentation

Follow up discussions with the industrial experts and proofreader in a small group is vital to ensure all the findings of the occupational analysis are valid, reliable and sufficient.

The final report of OA must be well presented with discussion, conclusion and recommendations in order to guide the general readers and interested parties to comprehend about the skilled workforce scenario in the industries.

Details of the process flow in developing the OA is as shown in Figure 5.0.

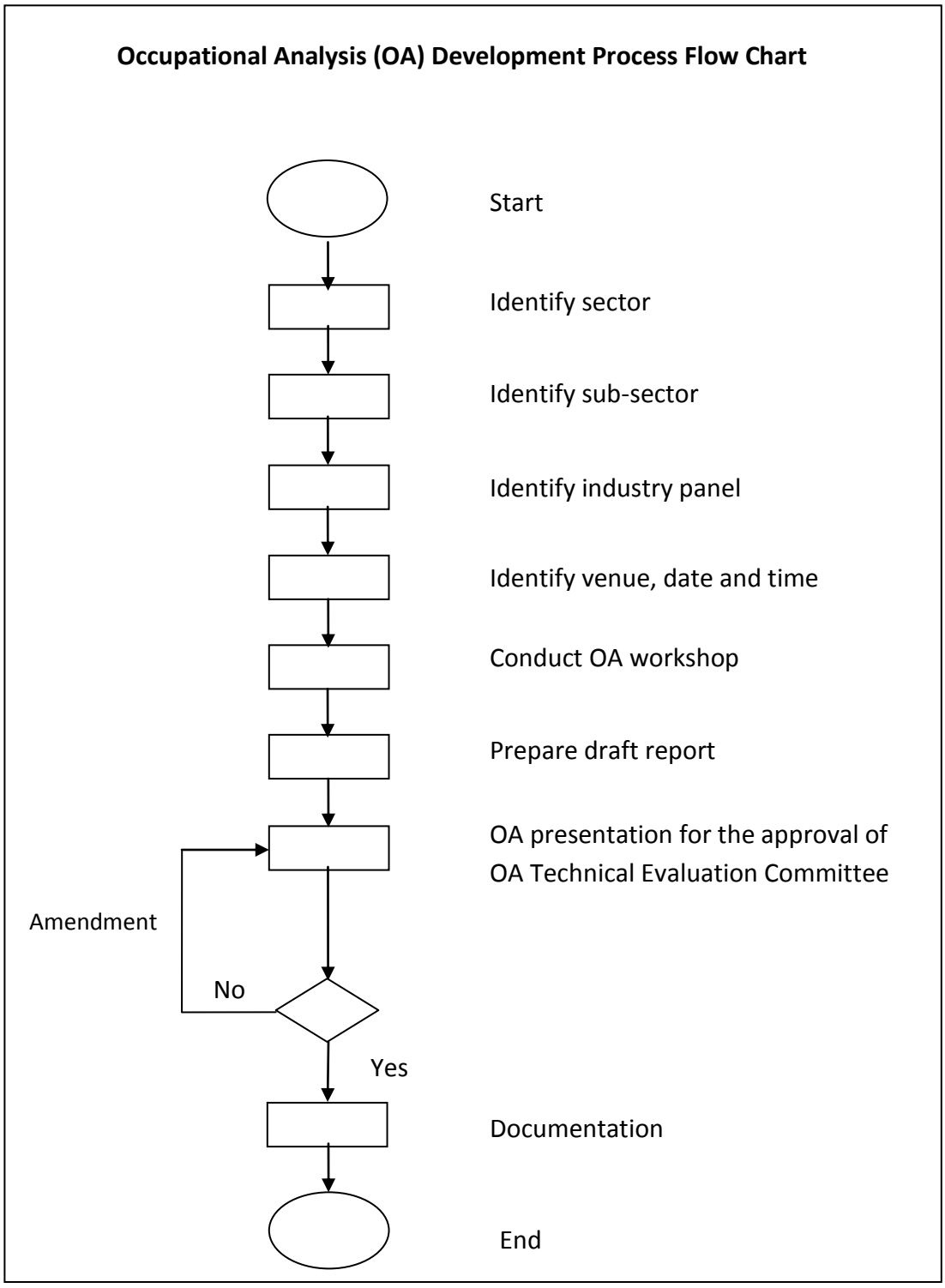

Figure 5.0: Occupational Analysis Development Process Flow Chart

3.3 OCCUPATIONAL DESCRIPTION DEVELOPMENT

The Occupational Description (OD) is the detailed description of the main job scope of the job title. Below are the main steps in producing an OD for the respective job titles:

i. determine the main sub-sectors and areas in the sector;
ii. identify the job titles; and
iii. identify the job scope.

To describe the Occupational Description clearly, the statement must consist of an ***Object***, ***Verb*** and ***Qualifier***. The rationale of determining the description attributes is to facilitate NOSS development especially in job and competency analysis.

a) Object

The object is determined first before the verb and qualifier. It is the main determinant to distinguish one job to another. The objects are acquired from the industrial experts during a brainstorming session and written on DACUM cards so that all the experts can see the objects identified. Objects of those in the related area or sub-sector are determined as in the example below.

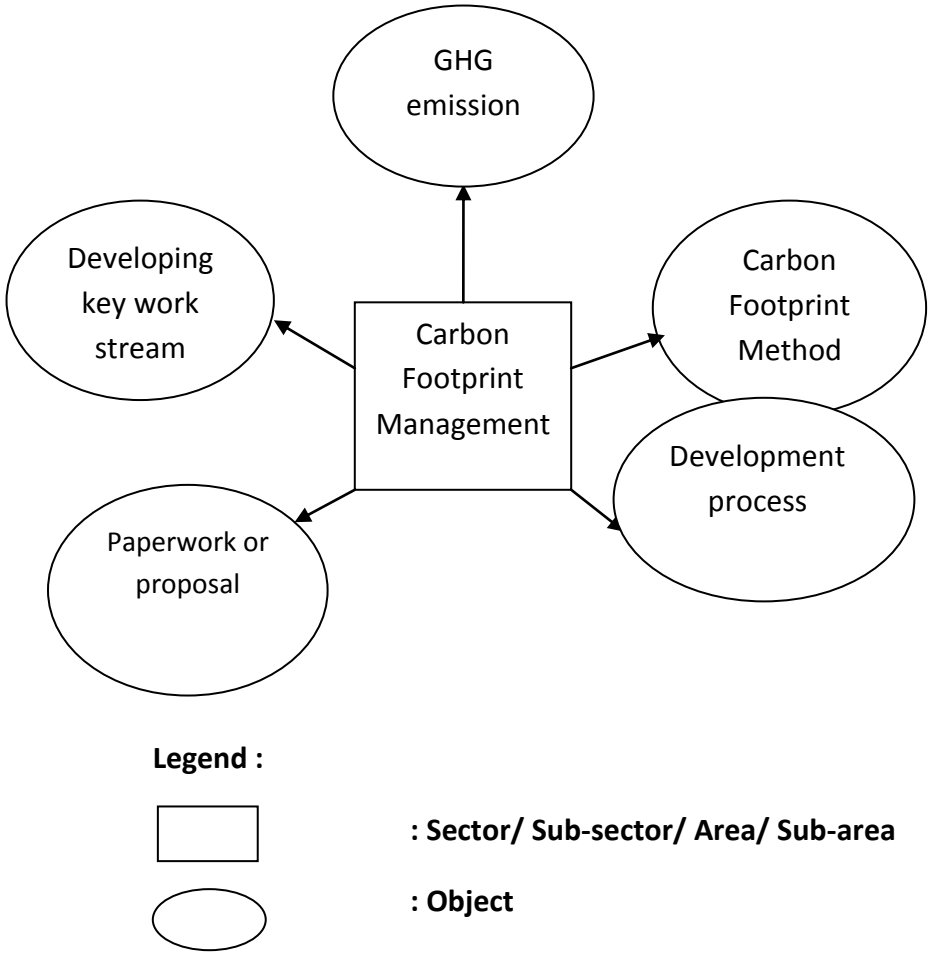

Figure 6.0: Example of Identifying Objects

b) Verb

The verb is then determined based on the level of difficulty of the identified job titles, such as below:

- *Object :* ***GHG emission data***
- *Verb for Level 3 :* ***Calculate and analyse***
- *Verb for Level 4 :* ***Verify***
- *Verb for Level 5 :* ***Endorse***

Hence, the contents of the job definitions will be as below:

- Carbon Footprint Lead Auditor (Level 5)
  - ✓ ***Endorse GHG emission data*** *+ (qualifier)*
- Carbon Footprint Auditor (Level 4)
  - ✓ ***Verify GHG emission data*** *+ (qualifier)*
- Carbon Footprint Data Collector (Level 3)
  - ✓ ***Calculate and analyse GHG emission data*** *+ (qualifier)*

c) Qualifier

Based on the example above, the statement is not clear as there is no qualifier for the object, therefore a qualifier must be added to further clarify it. Below is an example:

- ***Calculate and analyse GHG emission data according to determined standard***

3.4 CONCLUSION

These chapters have elaborated on the methodology used in the study which is through literature review, brainstorming sessions and DESCUM (Development of Standard and Curriculum). The development of the Occupational Structure and Occupational Description obtained via brainstorming sessions will be presented in the next chapter, Chapter 4, Findings.

4. FINDINGS

4.1 INTRODUCTION

The identified sectors for the Marine Engineering Industry were obtained through discussions with industry experts during the development workshop sessions and interviews. Based on the discussions held during development workshops, the development panel members had identified that the main sectors under the Marine Engineering Industry in Malaysia were to be segregated into 4 different Occupational Structures which are Ship Building and Ship Repair, Offshore Fabrication and Installation, Ship Design and Ship Board Operation.

4.2 OCCUPATIONAL STRUCTURE AND OCCUPATIONAL AREA STRUCTURE

The Occupational Structures for these sectors are included in this section, firstly the sectors and relevant areas are shown, then following them will be the Occupational Structures that show the common job titles in the industry and are presented under each relevant sub-sector and area.

Following each Occupational Structure framework is an Occupational Area Structure that depicts the common job scope for each of the areas as defined in their respective occupational structures. In the Occupational Area Analysis, job titles under the same area may be combined if the job scope is similar. This is to show the common responsibilities of the personnel regardless of job title, as job titles may vary between different institutions and organisation's. Below are the descriptions of each of the different sectors and sub sectors:

i. Ship Building and Repairing

Under this sub sector, there are 5 areas that are pertinent to ship building and ship repairing which are piping, electrical and instrumentation, hull, mechanical and preservation. The personnel under the piping area may start as Fitters at Level 1, Piping System Technician at Level 2, Piping System Supervisor at Level 3, Piping System Technical Executive at level 4 and finally as Piping System Manager at level 5. These personnel will be responsible for the ship's piping system preparation, fabrication, installation and maintenance.

The personnel under the Electrical and Instrumentation (E & I) area are responsible for the preparation, installation, maintenance and management of the ship's electrical devices, electrical appliances, lighting system and overall electrical system. The Instrumentation personnel under the E & I area will perform the testing and calibration of the electrical devices, appliances and lighting on the ship. This is important to ensure that they are in good working condition and are accurate. The personnel start their careers as Junior Technicians at Level 1, then proceed as Technicians at level 2, Supervisors at level 3, Technical Executives at level 4 and finally as Managers at level 5.

The Hull area involves personnel who will be responsible for the construction of the ship's hull which is the body of the ship. The personnel at entry level 1 are divided according to their specialisation of material used to build the ship hull. These materials are aluminum, composite, steel and wood. Then for each material they will be further divided into hull and outfitting work. Outfitting is the fitting of parts other than that of the Hull. Entry level personnel at level 1 are as Fitters that proceed to level 2 as Technicians, to Level 3 as Supervisors

and at Level 4 & Level 5 they will be able to oversee hull and outfitting work for all types of materials as their competencies are the same for the higher levels.

The personnel under Mechanical are divided into Engine, Propulsion, Auxiliary, Heating, Ventilation and Air-Conditioning (HVAC) and Cargo System. HVAC systems can provide ventilation, reduce air infiltration, and maintain pressure relationships between spaces. The three central functions of heating, ventilating, and air-conditioning are interrelated, especially with the need to provide thermal comfort and acceptable indoor air quality within reasonable installation, operation, and maintenance costs. The means of air delivery and removal from spaces is known as room air distribution. Propulsion Engineering focuses on the propulsion systems that power the various marine vessels. The kind of propulsion system that will power a maritime vessel will depend on the size of the vessel, what sort of waters it's going to be entering, what the function of the vessel is etc. The Auxiliary sub area is responsible for the operation, maintenance, and repair of mechanical equipment and systems installed in spaces outside of the engine room. The personnel under the Mechanical area start at Level 1 as Junior Mechanics, Mechanical Fitters for Propulsion, HVAC and Auxiliary. However, the entry level for Cargo Systems starts at Level 4 as Technical executives due to the complexity of the system.

The Preservation area deals with Painting, Blasting and Fairing work that deal with the exterior and surface preparation of the ship. Fairing is coating used on luxury ships. The personnel start at level 1 as Painting, Blasting or Fairing Junior Technicians then at Level 2 may advance as Technicians, at Level 3 as Supervisors. At Level 4, they will be Blasting & Painting Executives and at Level 5 as Blasting & Painting Managers, where they will be able to oversee both

painting and blasting work as their competencies are the same for the higher levels.

ii. Offshore Fabrication and Installation

The next sub sector is Offshore Fabrication and Installation which are usually platforms and other vessels than ships. The areas and levels of competencies under this sub sector are mostly similar such as Piping and Electrical & Instrumentation however the skills and technologies used are different from those under the Ship Building & Ship Repairing sub sector.

Under the Structure area, the personnel are responsible for the fabrication of the steel structure where their entry level is at Level 1 as Steel Structure Fitter. They may proceed to higher levels until the highest level which is as the Structure Manager at Level 5.

Outfitting is also another area that deals with the fittings and fixtures other than the main structure, where personnel start at Level 1 and are known as Accommodation & Outfitting personnel until Level 5 as Accommodation & Outfitting Managers.

Under the Mechanical area the difference with the Mechanical Engineering on Ships is that there are no cargo systems. The level of competencies are the same for the Engine, Propulsion, Auxiliary and Marine HVAC between the Mechanical area for Ships and Offshore structures though the personnel require different skills and technologies.

The Preservation area under Offshore Fabrication and Installation involves Blasting and Painting work that deal with the interior and exterior surface

preparation and coating of the floaters (vessels). The personnel start at level 1 as Painting or Blasting Junior Technicians then at Level 2 may advance as Technicians, at Level 3 as Supervisors until Level 5, where they will be Blasting or Painting Managers.

iii. Ship and Offshore Designing

The Ship & Offshore Design sub sector consists of the Naval Architecture, Electrical & Instrumentation and Mechanical Piping Design personnel. Naval Architecture focuses on designing the structure of various maritime and naval vessels. Personnel in this field must ensure the design of vessels that are both extremely safe under the often wild conditions of the ocean, but are still able to effectively perform whatever function they've been designed for. Electrical & Instrumentation design personnel are responsible for the design of electrical systems on ships and other offshore structures. Personnel under the Mechanical Piping Design area are responsible for the design of piping systems. The personnel under this sub sector start at Level 3 as Draughtsman in their respective areas and may proceed until the highest level as Design Specialists.

iv. Ship Board Operation

The Ship Board Operation sub sector consists of personnel under Deck Operation and Engine Operation. The personnel start at Level 1 in their respective areas and may proceed until the highest level of competency as the Captain for Deck Operation and Chief Engineer for Engine Operation. It must be highlighted that the personnel under this area that wish to serve on board seagoing vessels must comply with the Malaysian Marine Department (MARDEP) requirements that follow the international STCW Convention

(Standards of Training, Certification and Watchkeeping). Ship Board Operation (Engine Operation) positions are as below:

- Chief Engineer: In charge of the engine department.
- Second Engineer: In charge of the day-to-day running of the engine department. Often in charge of main engine maintenance.
- Oiler: A Rating who is responsible for ensuring that machinery is adequately lubricated.
- Wiper: The lowest rating in the engine room and is tasked with keeping the machinery spaces clean and tidy. Wipers usually go on to become oilers once they are familiar with engine room machinery and specific routines. A wiper is the entry level position in the engine department. The name came from the job function on old-fashioned ships, with a wiper actually wiping the equipment off, as well as watching and learning from the more experienced members of the engine department. Today the wiper is more like a "gofer," helping and assisting everyone else in the department.

The Deck Operation area consists of personnel in charge of the Deck area of the ship such as below:

- Captain: The Captain is responsible for the safe and efficient operation of a merchant vessel, including crew management, navigation, cargo operations and making sure that the vessel is in compliance with all international and local laws, as well as any state or company policies.
- Chief Mate : The Chief Mate is the head of the Deck Operation area or Deck department of the ship. This involves administrative tasks such as scheduling work, quality control, coordinating with other departments, and conflict resolution. The Chief Mate also compiles supply, overtime,

and cost control records, and requisitions or purchases stores and equipment.

- Bosun : A Bosun is responsible for the rigging, anchors, cables, sails, and other items that are used to keep a ship running smoothly.
- Watchkeeping Officer: The Watchkeeping Officer in nautical terms concerns the division of qualified personnel to operate a ship continuously. On a typical sea-faring vessel, be it naval or merchant, personnel keep watch on the bridge and over the running machinery. They are responsible for the safe navigation of the ship. Safe navigation means keeping the vessel on course and away from dangers as well as collision avoidance from other shipping.
- Able-Bodied Seamen (AB) and an Ordinary Seaman: On a fully manned ship, each deck watch consists of an Able-Bodied Seamen (AB) and an Ordinary Seaman. The ABs will divide their time between the helm station, standing lookout on the bow, and standing by in the crew mess or the crew lounge for any duties that may arise. The Ordinary Seaman will work as directed by the Chief Mate and the Bosun.

4.2.1 OCCUPATIONAL AREA ANALYSIS

The Occupational Area Analysis is done so that the current job titles in the industry are translated into the job areas required of the personnel. In doing so, candidates will have better employment prospects as there will be no mismatch of job titles to expected job competencies. This is because different organisations use different job titles. Certification will also be able to reflect the job competencies correctly and avoid confusion of job scope based on job titles.

For the Ship Building and Ship Repairing job areas, it has been analysed by expert panel members that personnel start their careers at Level 1 where their job areas

consist of installation, operation and maintenance work. They will be specialised in their areas of production at level 1 until level 3 respectively. At Level 4, their scope of work will consist of operation, installation and maintenance coordination in their respective areas. At Level 5, their scope of work will consist of operation, installation and maintenance management in their respective areas.

Under the Ship & Offshore Design sub sector personnel start at Level 3 where their job scope is design operation and they may advance until Level 8 and conduct Design Planning.

Under Ship Board Operation, the personnel at Levels 1 and 2 have been merged because their job scopes are similar and may be combined into one area. Whereas at Level 4 and Level 5 the personnel will focus on Deck Administration and Management in their respective areas.

Table 6.0 : Marine Engineering Industry – Ship Building & Ship Repairing Occupational Structure

Sector	**Marine Engineering Industry**		
Sub Sector	**Ship Building & Ship Repairing**		
Area	**Piping System**	**Electrical & Instrumentation**	
Sub Area/ Level		**Electrical**	**Instrumentation**
Level 8	*No Level*	*No Level*	*No Level*
Level 7	*No Level*	*No Level*	*No Level*
Level 6	*No Level*	*No Level*	*No Level*
Level 5	Piping System Manager	Marine Electrical Manager	Marine Instrumentation Manager
Level 4	Piping System Technical Executive	Marine Electrical Technical Executive	Marine Instrumentation Technical Executive
Level 3	Piping System Supervisor*	Marine Electrical Supervisor*	Marine Instrumentation Supervisor*
Level 2	Piping System Technician*	Marine Electrical Technician*	Marine Instrumentation Technician*
Level 1	Piping System Fitter*	Marine Electrical Junior Technician*	Marine Instrumentation Junior Technician*

*Notes: *Critical Job Title*

Table 6.0 : Marine Engineering Industry – Ship Building & Ship Repairing Occupational Structure (continued)

Sector	**Marine Engineering Industry**								
Sub Sector	**Ship Building & Ship Repairing**								
Area	**Hull**								
Sub Area/ Level	**Aluminum**	**Outfitting**	**Steel**	**Outfitting**	**Composite**	**Outfitting**	**Wood**	**Outfitting**	**Ship Carpentry**
Level 8	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 7	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 6	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 5	Ship Hull Manager (Aluminum& Steel)				Ship Hull Manager (Composite)		Ship Hull Manager (Wood)		
Level 4	Ship Hull Technical Executive (Aluminum)		Ship Hull Technical Executive (Steel)		Ship Hull Technical Executive (Composite)		Ship Hull Technical Executive (Wood)		
Level 3	Ship Hull Supervisor (Aluminum)*	Outfitting Supervisor (Aluminum)	Ship Hull Supervisor (Steel)*	Outfitting Supervisor (Steel)	Ship Hull Supervisor (Composite)*	Outfitting Supervisor (Composite)	Ship Hull Supervisor (Wood)	Outfitting Supervisor (Wood)	Ship Carpentry Supervisor
Level 2	Ship Hull Technician (Aluminum)*	Outfitting Technician (Aluminum)	Ship Hull Technician (Steel)*	Outfitting Technician (Steel)	Ship Hull Technician (Composite)*	Outfitting Technician (Composite)	Ship Hull Technician (Wood)	Outfitting Technician (Wood)	Ship Carpentry Technician
Level 1	Ship Hull Fitter (Aluminum)*	Outfitter (Aluminum)	Ship Hull Fitter (Steel)*	Outfitter (Steel)	Ship Hull Fitter (Composite)*	Outfitter (Composite)	Ship Hull Fitter (Wood)	Outfitter (Wood)	Ship Carpenter

*Notes: *Critical Job Title*

Table 6.0 : Marine Engineering Industry – Ship Building & Ship Repairing Occupational Structure (continued)

Sector	**Marine Engineering Industry**							
Sub Sector	**Ship Building & Ship Repairing**							
Area	**Mechanical**					**Preservation**		
Sub Area/ Level	**Engine**	**Auxiliary**	**Propulsion**	**Marine HVAC**	**Cargo System**	**Blasting**	**Painting**	**Fairing**
Level 8	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 7	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 6	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 5	Marine Mechanical Manager				Cargo System Manager*	Blasting & Painting Manager		
Level 4	Marine Mechanical Technical Executive (Engine)	Marine Mechanical Technical Executive (Auxiliary)	Marine Mechanical Technical Executive (Propulsion)	Marine Mechanical Technical Executive (Marine HVAC)	Cargo System Technical Executive*	Blasting & Painting Technical Executive		
Level 3	Marine Mechanical Supervisor (Engine)	Marine Mechanical Supervisor (Auxiliary)	Marine Mechanical Supervisor (Propulsion)*	Marine Mechanical Supervisor (Marine HVAC)	*No Level*	Blasting Supervisor	Painting Supervisor	Fairing Supervisor (Cold Fairing)
Level 2	Marine Mechanical Technician (Engine)	Marine Mechanical Technician (Auxiliary)	Marine Mechanical Technician (Propulsion)*	Marine Mechanical Technician (Marine HVAC)	*No Level*	Blasting Technician	Painting Technician	Fairing Technician (Cold Fairing)
Level 1	Marine Mechanical Fitter (Engine)	Marine Mechanical Fitter (Auxiliary)	Marine Mechanical Fitter (Propulsion)*	Marine Mechanical Fitter (Marine HVAC)	*No Level*	Blasting Junior Technician	Painting Junior Technician	Fairing Junior Technician (Cold Fairing)

*Notes: *Critical Job Title*

Table 7.0 Marine Engineering Industry – Offshore Fabrication & Installation Occupational Structure

Sector	**Marine Engineering Industry**		
Sub Sector	**Offshore Fabrication & Installation**		
Area	**Piping System**	**Electrical & Instrumentation**	
Sub Area/ Level		**Electrical**	**Instrumentation**
Level 8	*No Level*	*No Level*	*No Level*
Level 7	*No Level*	*No Level*	*No Level*
Level 6	*No Level*	*No Level*	*No Level*
Level 5	Piping System Manager	Marine Electrical Manager	Marine Instrumentation Manager
Level 4	Piping System Technical Executive	Marine Electrical Technical Executive	Marine Instrumentation Technical Executive
Level 3	Piping System Supervisor*	Marine Electrical Supervisor*	Marine Instrumentation Supervisor*
Level 2	Piping System Technician*	Marine Electrical Technician*	Marine Instrumentation Technician*
Level 1	Piping System Fitter*	Marine Electrical Junior Technician*	Marine Instrumentation Junior Technician*

*Notes: *Critical Job Title*

Table 7.0 Marine Engineering Industry – Offshore Fabrication & Installation Occupational Structure (continued)

Sector	**Marine Engineering Industry**				
Sub Sector	**Offshore Fabrication & Installation**				
Area	**Structure**	**Mechanical**			
Sub Area/ Level	**Steel**	**Engine**	**Auxiliary**	**Propulsion**	**Marine HVAC**
Level 8	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 7	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 6	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 5	Marine Structure Manager	Marine Mechanical Manager			
Level 4	Marine Structure Technical Executive	Marine Mechanical Technical Executive (Engine)	Marine Mechanical Technical Executive (Auxiliary)	Marine Mechanical Technical Executive (Propulsion)	Marine Mechanical Technical Executive (HVAC)
Level 3	Marine Structure Supervisor*	Marine Mechanical Supervisor (Engine)*	Marine Mechanical Supervisor (Auxiliary)*	Marine Mechanical Supervisor (Propulsion)*	Marine Mechanical Supervisor (HVAC)*
Level 2	Marine Structure Technician*	Marine Mechanical Technician (Engine)*	Marine Mechanical Technician (Auxiliary)*	Marine Mechanical Technician (Propulsion)*	Marine Mechanical Technician (HVAC)*
Level 1	Marine Structure Fitter*	Marine Mechanical Fitter (Engine)*	Marine Mechanical Fitter (Auxiliary)*	Marine Mechanical Fitter (Propulsion)*	Marine Mechanical Fitter (HVAC)*

*Notes: *Critical Job Title*

Table 7.0 Marine Engineering Industry – Offshore Fabrication & Installation Occupational Structure (continued)

Sector	**Marine Engineering Industry**		
Sub Sector	**Offshore Fabrication & Installation**		
Area	**Outfitting**	**Preservation**	
Sub Area/ Level		**Blasting**	**Painting**
Level 8	*No Level*	*No Level*	*No Level*
Level 7	*No Level*	*No Level*	*No Level*
Level 6	*No Level*	*No Level*	*No Level*
Level 5	Accommodation & Outfitting Manager	Blasting & Painting Manager	
Level 4	Accommodation & Outfitting Technical Executive	Blasting & Painting Technical Executive	
Level 3	Accommodation & Outfitting Supervisor*	Blasting Supervisor	Painting Supervisor
Level 2	Accommodation & Outfitting Technician*	Blasting Technician	Painting Technician
Level 1	Accommodation & Outfitting Fitter*	Blasting Junior Technician	Painting Junior Technician

*Notes: *Critical Job Title*

Table 8.0 Marine Engineering Industry – Ship & Offshore Designing Occupational Structure

Sector	**Marine Engineering Industry**			
Sub Sector	**Ship & Offshore Designing**			
Area	**Engineering**			
Sub Area/ Level	**Naval Architecture**	**Electrical & Instrumentation**		**Mechanical**
		Electrical	**Instrumentation**	**Piping / Machinery**
Level 8	Naval Architecture Specialist	Electrical Design Specialist	Instrumentation Design Specialist	Piping / Machinery Design Specialist
Level 7	Chief Naval Architect	Electrical Chief Design Manager	Instrumentation Chief Design Manager	Piping / Machinery Chief Design Manager
Level 6	Naval Architect	Electrical Design Manager	Instrumentation Design Manager	Piping / Machinery Design Manager
Level 5	Assistant Naval Architect*	Electrical Senior Designer*	Instrumentation Senior Designer*	Piping / Machinery Senior Designer
Level 4	Ship Designer*	Electrical Designer*	Instrumentation Designer*	Piping / Machinery Designer
Level 3	Draughtsman*	Electrical Draughtsman*	Instrumentation Draughtsman*	Piping / Machinery Draughtsman
Level 2	No Level	No Level	No Level	No Level
Level 1	No Level	No Level	No Level	No Level

*Notes: *Critical Job Title*

Table 9.0: Marine Engineering Industry – Ship Board Operation Occupational Structure

Sector	**Marine Engineering Industry**	
Sub Sector	**Ship Board Operation**	
Area / **Sub Area/ Level**	**Deck Operation**	**Engine Operation**
Level 8	*No Level*	*No Level*
Level 7	*No Level*	*No Level*
Level 6	Captain	Chief Engineer
Level 5	First Officer Chief Mate	Second Engineer
Level 4	Watchkeeping Officer	Watchkeeping Engineer
Level 3	Bosun (Deck Rating)	Oiler (Engine Rating)
Level 2	Leading Seaman (Deck Rating)	Greaser (Engine Rating)
Level 1	Able Body / Ordinary Seaman (Deck Rating)	Wiper (Engine Rating)

Table 10.0 : Marine Engineering Industry – Ship Building & Ship Repairing Occupational Area Structure

Sector	**Marine Engineering Industry**		
Sub Sector	**Ship Building & Ship Repairing**		
Area	**Piping System**	**Electrical & Instrumentation**	
Sub Area/ Level		**Electrical**	**Instrumentation**
Level 8	*No Level*	*No Level*	*No Level*
Level 7	*No Level*	*No Level*	*No Level*
Level 6	*No Level*	*No Level*	*No Level*
Level 5	Piping System Fabrication, Installation & Maintenance Management	Marine Electrical Installation, Operation & Maintenance Management	Marine Instrumentation Installation, Operation & Maintenance Management
Level 4	Piping System Fabrication, Installation & Maintenance Coordination	Marine Electrical Installation, Operation & Maintenance Coordination	Marine Instrumentation Installation, Operation & Maintenance Coordination
Level 3	Piping System Fabrication, Installation & Maintenance Supervision	Marine Electrical Installation, Operation & Maintenance Supervision	Marine Instrumentation Installation, Operation & Maintenance Supervision
Level 2	Piping System Fabrication, Installation & Maintenance	Marine Electrical Installation, Operation & Maintenance	Marine Instrumentation Installation, Operation & Maintenance
Level 1			

Table 10.0 : Marine Engineering Industry – Ship Building & Ship Repairing Occupational Area Structure (continued)

Sector	**Marine Engineering Industry**								
Sub Sector	**Ship Building & Ship Repairing**								
Area	**Hull**								
Sub Area/ Level	**Aluminium**	**Outfitting**	**Steel**	**Outfitting**	**Composite**	**Outfitting**	**Wood**	**Outfitting**	**Ship Carpentry**
Level 8	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 7	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 6	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 5	Marine Hull Fabrication, Installation & Maintenance Management (Aluminum & Steel)				Marine Hull Fabrication, Installation & Maintenance Management (Composite)		Marine Hull Fabrication, Installation & Maintenance Management (Wood)		
Level 4	Marine Hull Fabrication, Installation & Maintenance Coordination(Aluminum)		Marine Hull Fabrication, Installation & Maintenance Coordination(Steel)		Marine Hull Fabrication, Installation & Maintenance Coordination(Composite)		Marine Hull Fabrication, Installation & Maintenance Coordination(Wood)		
Level 3	Marine Hull Fabrication, Installation & Maintenance Supervision (Aluminum)	Outfitting Fabrication, Installation & Maintenance Supervision (Aluminum)	Marine Hull Fabrication, Installation & Maintenance Supervision (Steel)	Outfitting Fabrication, Installation & Maintenance Supervision (Steel)	Marine Hull Fabrication, Installation & Maintenance Supervision (Composite)	Outfitting Fabrication, Installation & Maintenance Supervision (Composite)	Marine Hull Fabrication, Installation & Maintenance Supervision (Wood)	Outfitting Fabrication, Installation & Maintenance Supervision (Wood)	Ship Carpentry Fabrication, Installation & Maintenance Supervision
Level 2	Marine Hull Fabrication, Installation & Maintenance (Aluminum)	Outfitting Fabrication, Installation & Maintenance (Aluminum)	Marine Hull Fabrication, Installation & Maintenance (Steel)	Outfitting Fabrication, Installation & Maintenance (Steel)	Marine Hull Fabrication, Installation & Maintenance (Composite)	Outfitting Fabrication, Installation & Maintenance (Composite)	Marine Hull Fabrication, Installation & Maintenance (Wood)	Outfitting Fabrication, Installation & Maintenance (Wood)	Ship Carpentry Fabrication, Installation & Maintenance
Level 1									

Table 10.0 : Marine Engineering Industry – Ship Building & Ship Repairing Occupational Area Structure (continued)

Sector	**Marine Engineering Industry**							
Sub Sector	**Ship Building & Ship Repairing**							
Area	**Mechanical**					**Preservation**		
Sub Area/ Level	**Engine**	**Auxiliary**	**Propulsion**	**Marine HVAC**	**Cargo System**	**Blasting**	**Painting**	**Fairing**
Level 8	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 7	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 6	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 5	Marine Mechanical Installation, Operation & Maintenance Management				Cargo System Operation & Maintenance Management	Marine Preservation Operation & Maintenance Management		
Level 4	Marine Mechanical Installation, Operation & Maintenance Coordination (Engine)	Marine Mechanical Installation, Operation & Maintenance Coordination (Auxiliary)	Marine Mechanical Installation, Operation & Maintenance Coordination (Propulsion)	Marine Mechanical Installation, Operation & Maintenance Coordination (Marine HVAC)	Cargo System Operation & Maintenance Coordination	Marine Preservation Operation & Maintenance Coordination		
Level 3	Marine Mechanical Installation, Operation & Maintenance Supervision (Engine)	Marine Mechanical Installation, Operation & Maintenance Supervision (Auxiliary)	Marine Mechanical Installation, Operation & Maintenance Supervision (Propulsion)	Marine Mechanical Installation, Operation & Maintenance Supervision (Marine HVAC)	No Level	Marine Preservation Operation & Maintenance Supervision (Blasting)	Marine Preservation Operation & Maintenance Supervision (Painting)	Marine Preservation Operation & Maintenance Supervision (Fairing)
Level 2	Marine Mechanical Installation, Operation & Maintenance (Engine)	Marine Mechanical Installation, Operation & Maintenance (Auxiliary)	Marine Mechanical Installation, Operation & Maintenance (Propulsion)	Marine Mechanical Installation, Operation & Maintenance (Marine HVAC)	No Level	Marine Preservation Operation & Maintenance (Blasting)	Marine Preservation Operation & Maintenance (Painting)	Marine Preservation Operation & Maintenance (Fairing)
Level 1					No Level	Marine Preservation Operation & Maintenance (Blasting)	Marine Preservation Operation & Maintenance (Painting)	Marine Preservation Operation & Maintenance (Fairing)

Table 11.0 Marine Engineering Industry – Offshore Fabrication & Installation Occupational Area Structure

Sector	**Marine Engineering Industry**		
Sub Sector	**Offshore Fabrication & Installation**		
Area	**Piping System**	**Electrical & Instrumentation**	
Sub Area/ Level		**Electrical**	**Instrumentation**
Level 8	*No Level*	*No Level*	*No Level*
Level 7	*No Level*	*No Level*	*No Level*
Level 6	*No Level*	*No Level*	*No Level*
Level 5	Piping System Fabrication & Installation Management	Marine Electrical Installation Management	Marine Instrumentation Installation Management
Level 4	Piping System Fabrication & Installation Coordination	Marine Electrical Installation Coordination	Marine Instrumentation Installation Coordination
Level 3	Piping System Fabrication & Installation Supervision	Marine Electrical Installation Supervision	Marine Instrumentation Installation Supervision
Level 2	Piping System Fabrication & Installation	Marine Electrical Installation	Marine Instrumentation Installation
Level 1			

Table 11.0 Marine Engineering Industry – Offshore Fabrication & Installation Occupational Area Structure (continued)

Sector	**Marine Engineering Industry**				
Sub Sector	**Offshore Fabrication & Installation**				
Area	**Structure**	**Mechanical**			
Sub Area/ Level	**Steel**	**Engine**	**Auxiliary**	**Propulsion**	**Marine HVAC**
Level 8	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 7	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 6	*No Level*	*No Level*	*No Level*	*No Level*	*No Level*
Level 5	Marine Structure Fabrication & Installation Management	Marine Mechanical Fabrication & Installation Management			
Level 4	Marine Structure Fabrication & Installation Coordination	Marine Mechanical Fabrication & Installation Coordination (Engine)	Marine Mechanical Fabrication & Installation Coordination (Auxiliary)	Marine Mechanical Fabrication & Installation Coordination (Propulsion)	Marine Mechanical Fabrication & Installation Coordination (HVAC)
Level 3	Marine Structure Fabrication & Installation Supervision	Marine Mechanical Fabrication & Installation Supervision (Engine)	Marine Mechanical Fabrication & Installation Supervision (Auxiliary)	Marine Mechanical Fabrication & Installation Supervision (Propulsion)	Marine Mechanical Fabrication & Installation Supervision (HVAC)
Level 2	Marine Structure Fabrication & Installation	Marine Mechanical Fabrication & Installation (Engine)	Marine Mechanical Fabrication & Installation (Auxiliary)	Marine Mechanical Fabrication & Installation (Propulsion)	Marine Mechanical Fabrication & Installation (HVAC)
Level 1					

Table 11.0 Marine Engineering Industry – Offshore Fabrication & Installation Occupational Area Structure (continued)

<table>
<tr><td>Sector</td><td colspan="3">Marine Engineering Industry</td></tr>
<tr><td>Sub Sector</td><td colspan="3">Offshore Fabrication & Installation</td></tr>
<tr><td>Area</td><td rowspan="2">Outfitting</td><td colspan="2">Preservation</td></tr>
<tr><td>Sub Area/ Level</td><td>Blasting</td><td>Painting</td></tr>
<tr><td>Level 8</td><td>No Level</td><td>No Level</td><td>No Level</td></tr>
<tr><td>Level 7</td><td>No Level</td><td>No Level</td><td>No Level</td></tr>
<tr><td>Level 6</td><td>No Level</td><td>No Level</td><td>No Level</td></tr>
<tr><td>Level 5</td><td>Marine Outfitting Fabrication & Installation Management</td><td colspan="2">Marine Preservation Application Management</td></tr>
<tr><td>Level 4</td><td>Marine Outfitting Fabrication & Installation Coordination</td><td colspan="2">Marine Preservation Application Coordination</td></tr>
<tr><td>Level 3</td><td>Marine Outfitting Fabrication & Installation Supervision</td><td>Marine Preservation Application Supervision (Blasting)</td><td>Marine Preservation Application Supervision (Painting)</td></tr>
<tr><td>Level 2</td><td rowspan="2">Marine Outfitting Fabrication & Installation</td><td rowspan="2">Marine Preservation Application (Blasting)</td><td rowspan="2">Marine Preservation Application (Painting)</td></tr>
<tr><td>Level 1</td></tr>
</table>

Table 12.0 Marine Engineering Industry – Ship & Offshore Designing Occupational Area Structure

Sector	Marine Engineering Industry			
Sub Sector	**Ship & Offshore Designing**			
Area	**Engineering**			
Sub Area/ Level	**Naval Architecture**	**Electrical & Instrumentation**		**Mechanical**
		Electrical	**Instrumentation**	**Piping / Machinery**
Level 8	Marine Engineering Design (Naval Architecture)	Marine Engineering Design (Electrical)	Marine Engineering Design (Instrumentation)	Marine Engineering Design (Piping/Machinery)
Level 7	Marine Engineering Design Management (Naval Architecture)	Marine Engineering Design Management (Electrical)	Marine Engineering Design Management (Instrumentation)	Marine Engineering Design Management (Piping/Machinery)
Level 6	Marine Engineering Design Operation Management (Naval Architecture)	Marine Engineering Design Operation Management (Electrical)	Marine Engineering Design Operation Management (Instrumentation)	Marine Engineering Design Production Management (Piping/Machinery)
Level 5	Marine Engineering Design Operation Administration (Naval Architecture)	Marine Engineering Design Operation Administration (Electrical)	Marine Engineering Design Operation Administration (Instrumentation)	Marine Engineering Design Production Administration (Piping/Machinery)
Level 4	Marine Engineering Design Coordination (Naval Architecture)	Marine Engineering Design Coordination (Electrical)	Marine Engineering Design Coordination (Instrumentation)	Marine Engineering Design Production Operation (Piping/Machinery)
Level 3	Marine Engineering Design Drafting (Naval Architecture)	Marine Engineering Design Drafting (Electrical)	Marine Engineering Design Drafting (Instrumentation)	Marine Engineering Design Drafting (Piping/Machinery)
Level 2	No Level	No Level	No Level	No Level
Level 1	No Level	No Level	No Level	No Level

Table 13.0: Marine Engineering Industry – Ship Board Operation Occupational Area Structure

Sector	**Marine Engineering Industry**	
Sub Sector	**Ship Board Operation**	
Area / **Sub Area/ Level**	**Deck Operation**	**Engine Operation**
Level 8	*No Level*	*No Level*
Level 7	*No Level*	*No Level*
Level 6	Deck Operation Management	Engine Operation Management
Level 5	Deck Operation Administration & Control	Engine Operation Administration & Control
Level 4	Deck Operation Coordination	Engine Operation Coordination
Level 3	Deck Operation & Maintenance Supervision	Engine Operation & Maintenance Supervision
Level 2	Deck Operation & Maintenance	Engine Operation & Maintenance
Level 1		

4.3 CRITICAL JOB TITLES

This section will highlight the skilled personnel requirement in the Marine Engineering Industry job areas which are in demand currently and in the near future. There were job titles identified during the brainstorming session with the panel members that they had categorised as critical. The job titles which were not considered as critical were because the current numbers of personnel under these categories were sufficient. Based on input from the expert panel members, the following table is the list of the critical job titles within short term and medium term.

Table 14.0: List of Critical Job Titles within Short Term and Medium Term

Item	Critical job Title	Short Term (1-3 years) (√)	Medium Term (4-5 years) (√)	Page
SHIP BUILDING & SHIP REPAIRING				
1.	Piping System Fitter	√		86
2.	Piping System Technician	√		87
3.	Piping System Supervisor	√		88
4.	Marine Electrical Junior Technician	√		91
5.	Marine Electrical Technician	√		92
6.	Marine Electrical Supervisor	√		93
7.	Marine Instrumentation Junior Technician	√		96
8.	Marine Instrumentation Technician	√		97
9.	Marine Instrumentation Supervisor	√		98
10.	Ship Hull Fitter (Aluminum)	√		101
11.	Ship Hull Technician (Aluminum)	√		102
12.	Ship Hull Supervisor (Aluminum)	√		103
13.	Ship Hull Fitter (Steel)	√		108
14.	Ship Hull Technician (Steel)	√		109
15.	Ship Hull Supervisor (Steel)	√		110
16.	Ship Hull Fitter (Composite)	√		116
17.	Ship Hull Technician (Composite)	√		117
18.	Ship Hull Supervisor (Composite)	√		118

Table 14.0: List of Critical Job Titles within Short Term and Medium Term

(continued)

Item	Critical job Title	Short Term (1-3 years) (√)	Medium Term (4-5 years) (√)	Page
19.	Marine Mechanical Fitter (Propulsion)	√		143
20.	Marine Mechanical Technician (Propulsion)	√		144
21.	Marine Mechanical Supervisor (Propulsion)	√		145
22.	Cargo System Technical Executive	√		152
23.	Cargo System Manager	√		153
OFFSHORE FABRICATION & INSTALLATION				
24.	Piping System Fitter	√		166
25.	Piping System Technician	√		167
26.	Piping System Supervisor	√		168
27.	Marine Electrical Junior Technician	√		171
28.	Marine Electrical Technician	√		172
29.	Marine Electrical Supervisor	√		173
30.	Marine Instrumentation Junior Technician	√		176
31.	Marine Instrumentation Technician	√		177
32.	Marine Instrumentation Supervisor	√		178
33.	Marine Structure Fitter	√		181
34.	Marine Structure Technician	√		182
35.	Marine Structure Supervisor	√		183
36.	Marine Mechanical Fitter (Engine)	√		186
37.	Marine Mechanical Technician (Engine)	√		187
38.	Marine Mechanical Supervisor (Engine)	√		188
39.	Marine Mechanical Fitter (Auxiliary)	√		190
40.	Marine Mechanical Technician (Auxiliary)	√		191
41.	Marine Mechanical Supervisor (Auxiliary)	√		192

Table 14.0: List of Critical Job Titles within Short Term and Medium Term (continued)

Item	Critical job Title	Short Term (1-3 years) (√)	Medium Term (4-5 years) (√)	Page
42.	Marine Mechanical Fitter (Propulsion)	√		194
43.	Marine Mechanical Technician (Propulsion)	√		195
44.	Marine Mechanical Supervisor (Propulsion)	√		196
45.	Marine Mechanical Fitter (Marine HVAC)	√		198
46.	Marine Mechanical Technician (Marine HVAC)	√		199
47.	Marine Mechanical Supervisor (Marine HVAC)	√		200
48.	Accommodation & Outfitting Fitter	√		203
49.	Accommodation & Outfitting Technician	√		204
50.	Accommodation & Outfitting Supervisor	√		205
SHIP & OFFSHORE DESIGNING				
51.	Draughtsman	√		217
52.	Ship Designer	√		218
53.	Assistant Naval Architect	√		219
54.	Electrical Draughtsman	√		223
55.	Electrical Designer	√		224
56.	Electrical Senior Designer	√		225
57.	Instrumentation Draughtsman	√		229
58.	Instrumentation Designer	√		230
59.	Instrumentation Senior Designer	√		231

Table 15.0: Summary of Critical Job Titles According to Sub Sectors

Sector	Sub-sector	Level								Total
		NL	1	2	3	4	5	6	7	8	
Marine Engineering Industry	Ship Building & Ship Repairing	-	7	7	7	1	1	-	-	-	**23**
	Offshore Fabrication & Installation	-	9	9	9	-	-	-	-	-	**27**
	Ship & Offshore Designing	-	-	-	3	3	3	-	-	-	**9**
	Ship Board Operation	-	-	-	-	-	-	-	-	-	**0**
Total Critical Job Titles		**-**	**16**	**16**	**19**	**4**	**4**	**-**	**-**	**-**	**59**
Total Job Titles Identified		**-**	**32**	**32**	**36**	**29**	**22**	**6**	**4**	**4**	**165**

4.4 OCCUPATIONAL DESCRIPTION

The Occupational Description describes the occupations under the Occupational Structure in terms of competencies and duties that they are designated to carry out as competent personnel. These Occupational Descriptions can be used as reference for employees, employers, practitioners, trainers and academicians alike. The Occupational Descriptions in this chapter are organised according to sector, area and hierarchy of levels.

4.5 CONCLUSION

Based on this chapter, the sub sectors that have been identified reflect the main sectors in the Marine Engineering Industry which are Ship Building & Ship Repairing, Offshore Installation & Fabrication, Ship & Offshore Designing and Ship Board Operation. The visual representations of the Occupational Structures and Occupational

Area Structures will enable for the industry to be interpreted at a glance in terms of levels of competency and available career paths.

5. DISCUSSIONS, CONCLUSIONS & RECOMMENDATIONS

5.1 INTRODUCTION

This chapter will discuss the findings and providing recommendation on the development of human capital for Marine Engineering Industry.

5.2 CONCLUSION

As a result of the Marine Engineering Industry Occupational Analysis conducted together with expert panel members from various organizations, a total of **4 Sub Sectors, 165 job titles and 13 areas** have been identified. Referring to Malaysia's economic plans and vision for the coming years, a framework of the Marine Engineering Industry workforce has been identified.

5.3 DISCUSSIONS & RECOMMENDATIONS

To ensure that Malaysian marine based industry remain competitive in the global employment market, the manpower in the industry need to be trained in the advanced technology of current ships. This requires many corrective actions at the national level to enhance their training much beyond the current scope of current curriculum and make them competent to meet the technology challenge of new ships and thereby enhance their employability globally. A number of initiatives are required to meet these challenges which include revision of the curriculum, course certification and also general enhancements of the training infrastructure. Academic institutions and other skills institutions should play an important role in addressing this issue. As the result from this Occupational Analysis, it can be the basis of restructuring their training programs and curriculum. Endowed with strong government support, this industry could expand more and continuously contribute to Malaysian economy. It is hoped that

the result of this Occupational Analysis will be able to be used as reference as how to fulfill the future plans of developing skilled personnel and certifying Malaysians in the Marine Engineering Industry towards improving the quality of the local industry and at boosting Malaysia's global competitiveness.

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ANNEX 1 : MALAYSIAN OCCUPATIONAL SKILLS QUALIFICATION FRAMEWORK (MOSQF) LEVEL DESCRIPTOR

MALAYSIAN OCCUPATIONAL SKILLS QUALIFICATION FRAMEWORK (MOSQF) LEVEL DESCRIPTOR

Level	Level Description
1	Achievement at this level reflects the ability to use relevant knowledge, skills and procedures to **complete routine and predictable tasks** that include responsibility for completing tasks and procedures subject to **direction or guidance**
2	Achievement at this level reflects the ability to select and use relevant knowledge, **ideas**, skills and procedures to **complete well-defined tasks and address straightforward problem**. It includes **taking responsibility** for completing tasks and procedures, **and exercising autonomy** and **judgment** subject to overall direction or guidance
3	Achievement at this level reflects the ability to **identify and use relevant understanding,** methods and skills to **complete task** and address problems that are well defined with a **measure of complexity.** It includes taking responsibility for initiating and completing tasks and procedures as well as exercising autonomy and judgments **within limited parameter.** It also reflects awareness of different perspectives or approaches within an area of study or work
4	Achievement at this level reflects the ability to identify and use relevant understanding, methods and skills to address problems that are well defined but **complex and non-routine**. It includes taking responsibility for overall courses of action as well as exercising autonomy and **judgment within fairly broad** parameters. It also reflects **under-standing of different** perspective or approaches within an area of study or work
5	Achievement at this level reflects the ability to identify and use relevant understanding, methods and skills to address **broadly-defined, complex problems**. It includes taking responsibility for **planning and developing courses** of action as well as exercising autonomy and judgment within broad parameters. It also reflects **understanding of different perspectives, approaches or schools of thought and the reasoning behind them**
6	Achievement at this level reflects the ability to **refine** and use relevant understanding, methods and skills to address **complex problems that have limited definition**. It includes taking responsibility for planning and developing courses of action **that are able to underpin substantial change or development, as well as exercising broad autonomy and judgment.** It also reflects an understanding of different perspectives, **approaches of schools of thought and the theories that underpin them**

Level	Level Description
7	Achievement at this level reflects the ability to **reformulate** and use relevant understanding, methodologies and approaches to address **problematic situations** that involve many interacting factors. It includes taking responsibility for **planning and developing** courses of action that initiate or underpin substantial change or development, as well as exercising broad autonomy and judgment. It also reflects an understanding **of theoretical and relevant methodological perspectives, and how they affect their area of study or work**
8	Achievement at this level reflects the **ability to develop original understanding** and extend an area of knowledge or professional practice. It reflects the ability to address problematic situations that involve many complexes, interacting factors through initiating, designing and undertaking research, development or strategic activities. It involves the exercise of broad autonomy, judgement and leadership in sharing responsibility for the development of a field of work or knowledge, or for creating substantial professional or organisational change. It also reflects a critical understanding of relevant theoretical and methodological perspectives and how they affect the field of knowledge or work.

ANNEX 2 : LIST OF PANEL OF EXPERTS AND FACILITATORS FOR THE DEVELOPMENT OF THE MARINE ENGINEERING INDUSTRY'S OCCUPATIONAL ANALYSIS

LIST OF PANEL OF EXPERTS FOR THE DEVELOPMENT OF THE MARINE ENGINEERING INDUSTRY'S OCCUPATIONAL ANALYSIS

NO.	NAME	POSITION	ORGANISATION
1.	Ir. Ee Teck Chee	Advisor	Boustead Heavy Industries Corporation Berhad
		Honorary Secretary	Association of Marine Industries of Malaysia (AMIM)
2.	Mr. Abdul Razak Bin Ismail	Executive Director	Ship Classification (M) Sdn. Bhd.
		Vice President	Association of Marine Industries of Malaysia (AMIM)
3.	Mr. Noor Asha Bin Abdul Rashid	New Construction Manager	Bureau Veritas (M) Sdn. Bhd.
		Treasurer	Association of Marine Industries of Malaysia (AMIM)
4.	Captain Lee Ghim Teck	Director of Training & Education	Malaysian Maritime Academy Sdn. Bhd.
5.	Captain Ting Hien Liong	Chief Executive Officer	Shin Yang Shipping Corporation Berhad
6.	Captain V. Sivanandan	Senior Lecturer	Malaysian Maritime Academy Sdn. Bhd.
7.	Cdr. (R) Raja Mohamed Mustafa	Chief Executive Officer	BYO Marine Sdn. Bhd.
8.	Ir. Ng Hock Seng	Senior General Manager	Boustead Penang Shipyard Sdn. Bhd.
9.	Lt. Cdr Zulhilmi Bin Jamaluddin	Quality Control Staff Officer	Naval Education Training Command (NETC),Royal Malaysian Navy
10.	Mr. Abdul Nasar Abdul Hadi	Principal Assistant Director	Jabatan Laut Malaysia
11.	Mr. Anuar Bin Mohd Noor	Senior Principal Analyst	Malaysian Industry Government Group For High Technology (MIGHT)

NO.	NAME	POSITION	ORGANISATION
12.	Mr. Baharudin Bin Hatim	Electrical & Instrumentation Manager	Malaysian Marine & Heavy Engineering Sdn. Bhd. (MMHE)
13.	Mr. Brendan Wright	General Manager	Boustead Langkawi Shipyard Sdn. Bhd.
14.	Mr. Daniel Yung Wu Yung	Executive Director	Yong Choo Kui Shipyard Sdn. Bhd.
15.	Mr. Haji Mohamed Bin Ithnin	General Manager	Boustead Heavy Industries Corporation Berhad
16.	Mr. Kamarulbahrin Saidin	Technical Advisor	Malaysia Shipowner's Association (MASA)
17.	Mr. Koey Chee Leong	Head of Production	Boustead Naval Shipyard Sdn. Bhd.
18.	Mr. Mohd Nizam Yusof	Head of Marketing and Commercial	MSET Shipbuilding Corporation Sdn. Bhd.
19.	Mr. Muhamad Kharis Bin Ahmad	Senior Operation Manager	Destination Marine Service Sdn. Bhd.
20.	Ms. Nur Syahira Binti Sharifuddin	Senior Executive	Boustead Heavy Industries Corporation Berhad
21.	Mr. Ooi Kien Chuan	General Manager	Muhibbah Marine Engineering Sdn. Bhd.
22.	Mr. Renco Yong King Hwa	Executive Director	Gimhawk Shipyard Sdn. Bhd.
23.	Mr. Sharuddin Bin Zainuddin	Project Manager	Kencana HL Sdn. Bhd.
24.	Mr. Zaimi Bin Zainal	Senior Lecturer	UniKL MIMET

LIST OF FACILITATORS OF EXPERTS FOR THE DEVELOPMENT OF THE MARINE ENGINEERING INDUSTRY'S OCCUPATIONAL ANALYSIS

DR. AMIRON ISMAIL

FACILITATOR

PRITEC ACADEMY

MR. FAHISZAM SAAD

CO - FACILITATOR

PRITEC ACADEMY

MR. ZOLHELMY ZOLKEPLY

SECRETARIAT

PRITEC ACADEMY

ANNEX 3 : OCCUPATIONAL DESCRIPTIONS (OD) FOR THE MARINE ENGINEERING INDUSTRY

SECTOR : MARINE ENGINEERING INDUSTRY

SUB SECTOR : SHIP BUILDING & SHIP REPAIRING

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Piping System
Sub Area	N/A
Job Title	Piping System Fitter*
Level	1

Job Definition :

A Piping System Fitter is designated to carry out piping system fabrication, installation, repairing and preservation application according to quality assurance & quality control procedures. The fitter also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out piping system fabrication.
4. Carry out piping system repairing.
5. Carry out piping system installation.
6. Carry out piping system preservation activities.
7. Adhere to quality assurance & quality control procedures.
8. Update piping system installation, fabrication & repairing checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Piping System
Sub Area	N/A
Job Title	Piping System Technician*
Level	2

Job Definition :

A Piping System Technician is designated to carry out piping fabrication and check piping system fabrication, installation, repairing and preservation application according to quality assurance & quality control procedures. The technician also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Inspect tools, equipment & materials preparation.
3. Carry out complex piping system fabrication, installation, and repair works.
4. Check piping system installation, fabrication and repair works.
5. Carry out and check piping system preservation.
6. Adhere to quality assurance & quality control procedures.
7. Check piping system installation, fabrication & repairing checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Piping System
Sub Area	N/A
Job Title	Piping System Supervisor*
Level	3

Job Definition :

A Piping System Supervisor is designated to supervise piping system fabrication, installation, repairing and preservation application according to quality assurance & quality control procedures. The supervisor also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate tools, equipment & materials preparation.
3. Supervise piping system fabrication activities.
4. Supervise piping system installation activities.
5. Supervise piping system repairing activities.
6. Supervise piping system preservation activities.
7. Adhere to quality assurance & quality control procedures.
8. Check piping system fabrication, installation & repairing checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Piping System
Sub Area	N/A
Job Title	Piping System Technical Executive
Level	4

Job Definition :

A Piping System Technical Executive is designated to monitor & control piping system fabrication, installation, repairing and preservation application activities according to quality assurance & quality control procedures. The technical executive also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate piping system installation & maintenance tools, equipment & materials availability.
3. Monitor & control piping system fabrication activities.
4. Monitor & control piping system installation activities.
5. Monitor & control piping system repairing activities.
6. Manage piping system preservation activities.
7. Perform piping system installation quality assurance & quality control procedures.
8. Verify piping system installation, fabrication & repairing checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Piping System
Sub Area	N/A
Job Title	Piping System Manager
Level	5

Job Definition :

A Piping System Manager is designated to plan & organise piping system fabrication, installation, repairing and preservation application activities. He also has to review and endorse quality assurance & quality control procedures. The manager also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Evaluate & endorse tools, equipment & materials procurement.
3. Plan & organise piping system fabrication.
4. Plan & organise piping system installation.
5. Plan & organise piping system repairing.
6. Plan & organise piping system preservation.
7. Review & endorse quality assurance & quality control procedures.
8. Endorse piping system installation, fabrication & repairing checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Electrical And Instrumentation
Sub Area	Electrical
Job Title	Marine Electrical Junior Technician*
Level	1

Job Definition :

A Marine Electrical Junior Technician is designated to operate switch gear, carry out preventive maintenance, installation, repairing and troubleshooting. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out marine electrical installation activities.
4. Carry out switch gear operation.
5. Carry out electrical preventive maintenance activities.
6. Carry out marine electrical troubleshooting.
7. Carry out marine electrical repairing.
8. Adhere to quality assurance & quality control procedures.
9. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Electrical And Instrumentation
Sub Area	Electrical
Job Title	Marine Electrical Technician*
Level	2

Job Definition :

A Marine Electrical Technician is designated to check switch gear operation, check preventive maintenance, installation, repairing and troubleshooting. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Carry out complex marine electrical installation and repair works.
4. Check switches gear operation.
5. Check marine electrical installation & repair works.
6. Check electrical preventive maintenance activities.
7. Check marine electrical troubleshooting.
8. Adhere to quality assurance & quality control procedures.
9. Check& update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Electrical And Instrumentation
Sub Area	Electrical
Job Title	Marine Electrical Supervisor*
Level	3

Job Definition :

A Marine Electrical Supervisor is designated to supervise switch gear operation, supervise preventive maintenance, installation, repairing and troubleshooting, perform electrical testing & commissioning and perform electrical equipment inspection & calibration. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise switch gear operation.
4. Supervise marine electrical installation activities.
5. Supervise electrical preventive maintenance activities.
6. Supervise marine electrical repairing.
7. Perform marine electrical equipment inspection & calibration.
8. Supervise marine electrical troubleshooting.
9. Perform marine electrical testing & commissioning.
10. Adhere to quality assurance & quality control procedures.
11. Check activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Electrical And Instrumentation
Sub Area	Electrical
Job Title	Marine Electrical Technical Executive
Level	4

Job Definition :

A Marine Electrical Technical Executive is designated to coordinate switch gear operation, coordinate preventive maintenance, installation, repairing and troubleshooting, verify electrical testing & commissioning and verify electrical equipment inspection & calibration. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate tools, equipment & materials availability.
3. Coordinate switch gear operation.
4. Coordinate marine electrical installation activities.
5. Coordinate electrical preventive maintenance activities.
6. Coordinate marine electrical repairing.
7. Coordinate marine electrical troubleshooting.
8. Verify marine electrical equipment inspection & calibration.
9. Verify marine electrical testing & commissioning.
10. Perform quality assurance & quality control procedures.
11. Verify activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Electrical And Instrumentation
Sub Area	Electrical
Job Title	Marine Electrical Manager
Level	5

Job Definition :

A Marine Electrical Manager is designated to monitor & control switch gear operation, plan & organise preventive maintenance, installation, repairing and troubleshooting, manage electrical testing & commissioning and review & endorse electrical equipment inspection & calibration. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Evaluate & endorse tools, equipment & materials procurements.
3. Monitor & control switch gear operation.
4. Monitor & control marine electrical installation activities.
5. Plan & organise electrical preventive maintenance activities.
6. Plan & organise marine electrical repairing.
7. Monitor & control marine electrical troubleshooting.
8. Review & endorse design adjustment.
9. Review & endorse marine electrical equipment inspection & calibration.
10. Manage marine electrical testing & commissioning.
11. Adhere to quality assurance & quality control procedures.
12. Endorse activities checklist.

Sector Marine Engineering Industry

Sub-sector Ship Building & Ship Repairing

Job Area Electrical And Instrumentation

Sub Area Instrumentation

Job Title Marine Instrumentation Junior Technician*

Level 1

Job Definition :

A Marine Instrumentation Junior Technician is designated to carry out preventive maintenance, installation, repairing and troubleshooting. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out marine instrumentation installation activities.
4. Carry out instrumentation preventive maintenance activities.
5. Carry out marine instrumentation repairing.
6. Carry out marine instrumentation troubleshooting.
7. Adhere to quality assurance & quality control procedures.
8. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Electrical And Instrumentation
Sub Area	Instrumentation
Job Title	Marine Instrumentation Technician*
Level	2

Job Definition :

A Marine Instrumentation Technician is designated to check preventive maintenance, installation, repairing and troubleshooting. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Carry out complex marine instrumentation installation and repair works.
4. Check instrumentation preventive maintenance activities.
5. Check marine instrumentation installation and repair works.
6. Check marine instrumentation troubleshooting.
7. Adhere to quality assurance & quality control procedures.
8. Check & update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Electrical And Instrumentation
Sub Area	Instrumentation
Job Title	Marine Instrumentation Supervisor*
Level	3

Job Definition :

A Marine Instrumentation Supervisor is designated to supervise preventive maintenance, installation, repairing and troubleshooting, perform instrumentation testing & commissioning and perform instrumentation equipment inspection & calibration. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise marine instrumentation installation activities.
4. Supervise instrumentation preventive maintenance activities.
5. Supervise marine instrumentation repairing.
6. Supervise marine instrumentation troubleshooting.
7. Perform marine instrumentation testing & commissioning.
8. Perform marine instrumentation equipment inspection & calibration.
9. Adhere to quality assurance & quality control procedures.
10. Check activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Electrical And Instrumentation
Sub Area	Instrumentation
Job Title	Marine Instrumentation Technical Executive
Level	4

Job Definition :

A Marine Instrumentation Technical Executive is designated to coordinate preventive maintenance, installation, repairing and troubleshooting, verify instrumentation testing & commissioning and verify instrumentation equipment inspection & calibration. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate tools, equipment & materials availability.
3. Perform system integration development.
4. Coordinate marine instrumentation installation activities.
5. Coordinate instrumentation preventive maintenance activities.
6. Coordinate marine instrumentation repairing.
7. Coordinate marine instrumentation troubleshooting.
8. Verify marine instrumentation equipment inspection & calibration
9. Verify marine instrumentation testing & commissioning.
10. Perform quality assurance & quality control procedures.
11. Verify activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Electrical And Instrumentation
Sub Area	Instrumentation
Job Title	Marine Instrumentation Manager
Level	5

Job Definition :

A Marine Instrumentation Manager is designated to monitor & control switch gear operation, plan & organise preventive maintenance, installation, repairing and troubleshooting, manage instrumentation testing & commissioning and review & endorse instrumentation equipment inspection & calibration. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Evaluate & endorse tools, equipment & materials procurements.
3. Monitor & control marine instrumentation installation activities.
4. Plan & organise instrumentation preventive maintenance activities.
5. Plan & organise marine instrumentation repairing.
6. Monitor & control marine instrumentation troubleshooting.
7. Review & endorse design adjustment.
8. Review & endorse marine instrumentation equipment inspection & calibration.
9. Plan & organise system integration development.
10. Manage marine instrumentation testing & commissioning.
11. Adhere to quality assurance & quality control procedures.
12. Endorse activities checklist.

Sector Marine Engineering Industry

Sub-sector Ship Building & Ship Repairing

Job Area Hull

Sub Area Aluminium

Job Title Ship Hull Fitter (Aluminium)*

Level 1

Job Definition :

A Ship Hull Fitter (Aluminum) is designated to carry out aluminum ship hull marking, cutting, fabrication, installation, and repairing. He also has to comply with quality assurance & control requirement and adhere to safety, health and environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out aluminum ship hull marking on materials.
4. Carry out aluminum ship hull plate cutting.
5. Carry out aluminum ship hull fabrication.
6. Carry out ship hull aluminum ship hull installation.
7. Carry out aluminum ship hull repair.
8. Adhere to quality assurance & quality control procedures.
9. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Aluminium
Job Title	Ship Hull Technician (Aluminium)*
Level	2

Job Definition :

A Ship Hull Technician (Aluminum) is designated to inspect aluminum ship hull marking, cutting, fabricate, install and repairing. He also has to comply with quality assurance & control requirement and adhere to safety, health and environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Check aluminum marking on materials.
4. Inspect aluminum ship hull plate cutting.
5. Carry out complex aluminum ship hull installation, fabrication and repair works.
6. Check aluminum ship hull fabrication, installation and repair works.
7. Adhere to quality assurance & quality control procedures.
8. Check activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Aluminium
Job Title	Ship Hull Supervisor (Aluminium)*
Level	3

Job Definition :

A Ship Hull Supervisor (Aluminum) is designated to supervise aluminum ship hull cutting, repairing, installation, marking and fabrication. He also has to comply with quality assurance & control requirement and adhere to safety, health and environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise and check aluminum ship hull marking on materials.
4. Supervise aluminum ship hull cutting.
5. Carry out aluminum ship hull testing.
6. Supervise aluminum ship hull repair.
7. Supervise & check aluminum ship hull fabrication.
8. Supervise & check aluminum ship hull installation.
9. Adhere to quality assurance & quality control procedures
10. Check activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Outfitting
Job Title	Outfitter (Aluminium)
Level	1

Job Definition :

An Outfitter (Aluminum) is designated to carry out aluminum ship hull marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out aluminum ship hull marking.
4. Carry out aluminum ship hull repair.
5. Carry out aluminum ship hull fitting activities.
6. Carry out aluminum ship hull cutting activities.
7. Adhere to quality control procedures.
8. Prepare activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Outfitting
Job Title	Outfitting Technician (Aluminium)
Level	2

Job Definition :

An Outfitting Technician (Aluminum) is designated to carry out and check aluminum ship hull marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Carry out aluminum ship hull fabrication.
4. Carry out aluminum ship hull marking on materials.
5. Carry out & check aluminum ship hull repair.
6. Carry out & check aluminum ship hull fitting activities.
7. Carry out & check aluminum ship hull cutting activities.
8. Adhere to quality control procedures.
9. Check activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Outfitting
Job Title	Outfitting Supervisor (Aluminium)
Level	3

Job Definition :

An Outfitting Supervisor (Aluminum) is designated to supervise aluminum ship hull marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise aluminum ship hull fabrication.
4. Supervise aluminum ship hull marking on materials.
5. Supervise aluminum ship hull repair.
6. Supervise aluminum ship hull fitting activities.
7. Supervise aluminum ship hull cutting activities.
8. Adhere to quality control procedures.
9. Check activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Aluminium, Outfitting
Job Title	Ship Hull Technical Executive (Aluminium)
Level	4

Job Definition :

A Ship Hull Technical Executive (Aluminum) is designated to coordinate, analyse, review & verify aluminum cutting, marking, testing, repairing, fabrication, lamination, aluminum mould preparation, aluminum design modification, system integration and outfitting. He also has to comply with quality assurance & control assessment and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate aluminum ship hull construction work.
4. Coordinate aluminum ship hull testing.
5. Coordinate aluminum ship hull repair.
6. Adhere to quality assurance & quality control procedures.
7. Coordinate aluminum ship hull plug making, lamination and lay up.
8. Analyse & review the mould & mould preparation.
9. Perform aluminum design modification.
10. Perform system integration.
11. Coordinate aluminum ship hull outfitting.
12. Verify aluminum block assembly.
13. Analyse & review activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Steel
Job Title	Ship Hull Fitter (Steel)*
Level	1

Job Definition :

A Ship Hull Fitter (Steel) is designated to carry out steel marking, cutting, fabricate, install and repair. He also has to comply with quality assurance & control requirement and adhere to safety, health and environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out marking works.
4. Carry out steel plate and material cutting.
5. Carry out steel fabrication.
6. Carry out ship hull steel installation.
7. Carry out steel ship hull repair.
8. Adhere to quality assurance & quality control procedures.
9. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Steel
Job Title	Ship Hull Technician (Steel)*
Level	2

Job Definition :

A Ship Hull Technician (Steel) is designated to inspect steel cutting, repairing, installation, marking and fabrication. He also has to comply with quality assurance & control requirement and adhere to safety, health and environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Carry out and check steel marking.
4. Inspect steel plate and material cutting.
5. Carry out & check steel fabrication.
6. Carry out & check ship hull steel installation.
7. Carry out ship hull repair.
8. Adhere to quality assurance & quality control procedures.
9. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Steel
Job Title	Ship Hull Supervisor (Steel)*
Level	3

Job Definition :

A Ship Hull Supervisor (Steel) is designated to supervise steel marking, cutting, fabricate, install and repair. He also has to comply with quality assurance & control requirement and adhere to safety, health and environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise and check steel marking.
4. Supervise steel plate and material cutting.
5. Carry out steel hull testing.
6. Supervise & check steel fabrication.
7. Supervise & check ship hull steel installation.
8. Supervise steel repair.
9. Adhere to quality assurance & quality control procedures
10. Check activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Outfitting
Job Title	Outfitter (Steel)
Level	1

Job Definition :

An Outfitter (Steel) is designated to carry out steel marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out marking works on steel plates and materials.
4. Carry out repair works.
5. Carry out steel fitting activities.
6. Carry out steel plates and material cutting activities.
7. Adhere to quality control procedures.
8. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Outfitting
Job Title	Outfitting Technician (Steel)
Level	2

Job Definition :

An Outfitting Technician (Steel) is designated to carry out and check steel marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Carry out steel plates and material fabrication.
4. Carry out complex marking works on steel plates and materials.
5. Carry out major repair works.
6. Carry out & check steel fitting activities.
7. Carry out complex cutting works on steel plates and materials.
8. Adhere to quality control procedures.
9. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Outfitting
Job Title	Outfitting Supervisor (Steel)
Level	3

Job Definition :

An Outfitting Supervisor (Steel) is designated to supervise steel marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise steel fabrication.
4. Supervise steel plates marking and materials marking.
5. Supervise steel repair.
6. Supervise steel fitting activities.
7. Supervise steel plates marking and materials cutting activities.
8. Adhere to quality control procedures.
9. Check activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Steel, Outfitting
Job Title	Ship Hull Technical Executive (Steel)
Level	4

Job Definition :

A Ship Hull Technical Executive (Steel) is designated to coordinate, analyse, review & verify Steel cutting, marking, testing, repairing, fabrication, lamination, steel mould preparation, steel design modification, system integration and outfitting. He also has to comply with quality assurance & control assessment and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate steel ship hull construction work.
4. Coordinate steel ship hull testing.
5. Coordinate steel ship hull repair.
6. Verify steel block assembly.
7. Coordinate steel ship hull plug making, lamination and lay up.
8. Analyse & review the mould & mould preparation.
9. Perform steel design modification.
10. Perform system integration.
11. Coordinate steel ship hull outfitting.
12. Adhere to quality assurance & quality control procedures.
13. Analyse & review activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Aluminium, Steel, Outfitting
Job Title	Ship Hull Manager (Aluminium & Steel)
Level	5

Job Definition :

A Ship Hull Manager (Aluminum & Steel) is designated to plan, organise, review & endorse cutting, marking, testing, repairing, fabrication, lamination, mould preparation, design modification, system integration and outfitting. He also has to comply with quality assurance & control assessment and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Plan & organise ship hull construction.
3. Review & endorse tools, equipment & materials preparation.
4. Plan & organise ship hull testing.
5. Plan & organise ship hull repair.
6. Plan & organise block assembly, plug making, lamination and lay up.
7. Review & endorse the mould & mould preparation.
8. Review & endorse design modification.
9. Plan & organise system integration.
10. Plan & organise ship hull outfitting.
11. Adhere to quality assurance & quality control procedures.
12. Review & endorse activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Composite
Job Title	Ship Hull Fitter (Composite)*
Level	1

Job Definition :

A Ship Hull Fitter (Composite) is designated to carry out composite ship hull cutting, marking, repair, mould making and lamination. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out composite ship hull marking on materials.
4. Carry out composite ship hull cutting.
5. Carry out composite ship hull repair.
6. Carry out composite ship hull fabrication.
7. Carry out mould making.
8. Carry out composite ship hull lamination.
9. Adhere to quality assurance & quality control procedures.
10. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Composite
Job Title	Ship Hull Technician (Composite)*
Level	2

Job Definition :

A Ship Hull Technician (Composite) is designated to carry out & inspect composite ship hull cutting, marking, repair, mould making, fabrication, composite lay-up, outfitting and lamination. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out & inspect tools, equipment & materials preparation.
3. Carry out & check composite ship hull marking on materials.
4. Carry out & inspect composite ship hull cutting.
5. Carry out complex composite ship hull installation, fabrication and repair works.
6. Check composite ship hull fabrication, installation, and repair works.
7. Carry out & check mould making.
8. Carry out & check composite ship hull lamination.
9. Carry out composite ship hull lay up.
10. Carry out composite ship hull outfitting.
11. Adhere to quality assurance & quality control procedures.
12. Check activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Composite
Job Title	Ship Hull Supervisor (Composite)*
Level	3

Job Definition :

A Ship Hull Supervisor (Composite) is designated to supervise, inspect & check composite ship hull cutting, marking, repair, mould making, fabrication, composite lay-up, outfitting, block assembly, plug making and lamination. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise & inspect tools, equipment & materials preparation.
3. Supervise & check composite ship hull marking on materials.
4. Supervise composite ship hull cutting.
5. Perform composite ship hull testing.
6. Supervise & inspect composite ship hull fabrication, installation and repair works.
7. Perform composite block assembly.
8. Perform composite plug making.
9. Supervise & check composite ship hull lamination.
10. Supervise composite ship hull lay up.
11. Perform de mould and mould preparation.
12. Supervise & check composite ship hull outfitting.
13. Adhere to quality assurance & quality control procedures.
14. Check activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Outfitting
Job Title	Outfitter (Composite)
Level	1

Job Definition :

An Outfitter (Composite) is designated to carry out composite ship hull marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out composite ship hull marking on materials.
4. Carry out composite ship hull cutting activities.
5. Carry out composite ship hull fitting activities.
6. Carry out composite ship hull repair.
7. Adhere to quality control procedures.
8. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Outfitting
Job Title	Outfitting Technician (Composite)
Level	2

Job Definition :

An Outfitting Technician (Composite) is designated to carry out and check composite ship hull marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Carry out composite ship hull fabrication.
4. Carry out composite ship hull marking on materials.
5. Carry out complex composite ship hull repair.
6. Carry out & check composite ship hull fitting activities.
7. Carry out & check composite ship hull cutting activities.
8. Adhere to quality control procedures.
9. Check activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Outfitting
Job Title	Outfitting Supervisor (Composite)
Level	3

Job Definition :

An Outfitting Supervisor (Composite) is designated to supervise composite ship hull marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise composite ship hull marking.
4. Supervise composite ship hull repair.
5. Supervise composite ship hull fitting activities.
6. Supervise composite ship hull cutting activities.
7. Supervise composite ship hull fabrication.
8. Adhere to quality control procedures.
9. Check activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Composite, Outfitting
Job Title	Ship Hull Technical Executive (Composite)
Level	4

Job Definition :

A Ship Hull Technical Executive (Composite) is designated to coordinate, analyse, review & verify composite cutting, marking, testing, repairing, fabrication, lamination, composite mould preparation, composite design modification, system integration and outfitting. He also has to comply with quality assurance & control assessment and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate composite ship hull construction work.
4. Coordinate composite ship hull testing.
5. Coordinate composite ship hull repair.
6. Adhere to quality assurance & quality control procedures.
7. Verify composite block assembly.
8. Coordinate composite ship hull plug making, lamination and lay up.
9. Analyse & review the mould & mould preparation.
10. Perform composite design modification.
11. Perform system integration.
12. Coordinate compositeship hull outfitting.
13. Analyse & review activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Composite, Outfitting
Job Title	Ship Hull Manager (Composite)
Level	5

Job Definition :

A Ship Hull Manager (Composite) is designated to plan, organise, review & endorse cutting, marking, testing, repairing, fabrication, lamination, mould preparation, design modification, system integration and outfitting. He also has to comply with quality assurance & control assessment and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Review & endorse tools, equipment & materials preparation.
3. Plan & organise ship hull construction.
4. Plan & organise ship hull testing.
5. Plan & organise ship hull repair.
6. Adhere to quality assurance & quality control procedures.
7. Plan & organise block assembly, plug making, lamination and lay up.
8. Review & endorse the mould & mould preparation.
9. Review & endorse design modification.
10. Plan & organise system integration.
11. Plan & organise ship hull outfitting.
12. Review & endorse activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Wood
Job Title	Ship Hull Fitter (Wood)
Level	1

Job Definition :

A Ship Hull Fitter (Wood) is designated to carry out wood ship hull cutting, marking, fabrication, repairing and keel-laying. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out repair works.
4. Carry out wood marking works on materials.
5. Carry out wood fabrication.
6. Carry out keel laying.
7. Comply with quality assurance & quality control procedures.
8. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Wood
Job Title	Ship Hull Technician (Wood)
Level	2

Job Definition :

A Ship Hull Technician (Wood) is designated to carry out and check wood ship hull cutting, marking, fabrication, keel laying, outfitting and repair. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out & check tools, equipment & materials preparation.
3. Carry out wood plates and material fabrication.
4. Carry out complex marking works on wood plates and materials.
5. Carry out major repair works.
6. Carry out cutting works on materials.
7. Perform wood lay-up.
8. Carry out & check keel laying.
9. Carry out wood outfitting.
10. Adhere to quality assurance & quality control procedures.
11. Check activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Wood
Job Title	Ship Hull Supervisor (Wood)
Level	3

Job Definition :

A Ship Hull Supervisor (Wood) is designated to supervise wood cutting, marking, fabrication, keel laying, outfitting and repair. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Perform wood testing.
4. Supervise wood repair.
5. Supervise marking and materials cutting activities.
6. Supervise wood fabrication.
7. Perform block assembly.
8. Supervise wood lay-up.
9. Supervise keel laying.
10. Supervise wood outfitting.
11. Comply with quality assurance & quality control procedures.
12. Check activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Outfitting
Job Title	Outfitter (Wood)
Level	1

Job Definition :

An Outfitter (Wood) is designated to carry out wood marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out wood marking.
4. Carry out wood repair.
5. Carry out wood fitting activities.
6. Carry out wood cutting activities.
7. Adhere to quality control procedures.
8. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Outfitting
Job Title	Outfitting Technician (Wood)
Level	2

Job Definition :

An Outfitting Technician (Wood) is designated to carry out and check wood marking, cutting, fitting and repair. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Carry out wood fabrication.
4. Carry out wood marking.
5. Carry out complex wood cutting activities.
6. Carry out complex wood fitting activities.
7. Carry out & check wood repair.
8. Adhere to quality control procedures.
9. Check activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Outfitting
Job Title	Outfitting Supervisor (Wood)
Level	3

Job Definition :

An Outfitting Supervisor (Wood) is designated to supervise wood marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise wood fabrication.
4. Supervise wood marking.
5. Supervise wood repair works.
6. Supervise wood fitting activities.
7. Supervise materials cutting activities.
8. Adhere to quality control procedures.
9. Check activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Ship Carpentry
Job Title	Ship Carpenter
Level	1

Job Definition :

A Ship Carpenter is designated to carry out fitting, finishing works and repairing. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out fitting for insulation, flooring, paneling and furniture.
4. Carry out finishing works (polishing, varnishing, painting).
5. Carry out repair works for insulation, flooring, paneling and furniture.
6. Comply with quality control procedures.
7. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Ship Carpentry
Job Title	Ship Carpentry Technician
Level	2

Job Definition :

A Ship Carpentry Technician is designated to carry out and check fitting, finishing works and repairing. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Check fitting and repair quality for insulation, flooring, paneling and furniture.
4. Check finishing works quality for polishing, varnishing, painting.
5. Comply with quality control procedures.
6. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Ship Carpentry
Job Title	Ship Carpentry Supervisor
Level	3

Job Definition :

A Ship Carpentry Supervisor is designated to supervise fitting, finishing works and repairing. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise fitting works for insulation, flooring, paneling and furniture.
4. Supervise finishing works for polishing, varnishing and painting.
5. Supervise repair works for polishing, varnishing and painting.
6. Comply with quality control procedures.
7. Check activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Wood, Outfitting, Ship Carpentry
Job Title	Ship Hull Technical Executive (Wood)
Level	4

Job Definition :

A Ship Hull Technical Executive (Wood) is designated to coordinate, analyse, review & verify wood cutting, marking, testing, repairing, fabrication, lamination, wood mould preparation, wood design modification, system integration and outfitting. He also has to comply with quality assurance & control assessment and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate wood ship hull construction work.
4. Coordinate wood ship hull testing.
5. Coordinate wood ship hull repair.
6. Verify woodblock assembly.
7. Coordinate wood ship hull plug making, lamination and lay-up.
8. Analyse & review the mould & mould preparation.
9. Perform wood design modification.
10. Perform system integration.
11. Coordinate wood ship hull outfitting.
12. Adhere to quality assurance & quality control procedures.
13. Analyse & review activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Hull
Sub Area	Wood, Outfitting, Ship Carpentry
Job Title	Ship Hull Manager (Wood)
Level	5

Job Definition :

A Ship Hull Manager (Wood) is designated to plan, organise, review & endorse cutting, marking, testing, repairing, fabrication, lamination, mould preparation, design modification, system integration and outfitting. He also has to comply with quality assurance & control assessment and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Review & endorse tools, equipment & materials preparation.
3. Plan & organise ship hull construction.
4. Plan & organise ship hull testing.
5. Plan & organise ship hull repair.
6. Plan & organise block assembly, plug making, lamination and lay-up.
7. Review & endorse the mould & mould preparation.
8. Review & endorse design modification.
9. Plan & organise system integration.
10. Plan & organise ship hull outfitting.
11. Adhere to quality assurance & quality control procedures.
12. Review & endorse activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Engine
Job Title	Marine Mechanical Fitter (Engine)
Level	1

Job Definition :

A Marine Mechanical Fitter (Engine) is designated to carry out engine parts dismantle, cleaning, engine component and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out tools, equipment & materials preparation.
3. Carry out first level maintenance (oiling, greasing, take reading).
4. Dismantle engine components.
5. Carry out engine parts cleaning.
6. Comply with quality assurance & quality control procedures.
7. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Engine
Job Title	Marine Mechanical Technician (Engine)
Level	2

Job Definition :

A Marine Mechanical Technician (Engine) is designated to carry out engine preventives maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out and check tools, equipment & materials preparation.
3. Carry out engine preventives maintenance.
4. Carry out engine overhauling.
5. Carry out & check engine parts cleaning.
6. Check engine components.
7. Carry out & check first level maintenance (oiling, greasing, take reading).
8. Comply with quality assurance & quality control procedures.
9. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Engine
Job Title	Marine Mechanical Supervisor (Engine)
Level	3

Job Definition :

A Marine Mechanical Supervisor (Engine) is designated to supervise engine preventives maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Supervise tools, equipment & materials preparation.
3. Supervise engine preventives maintenance.
4. Supervise engine ancillaries overhauling.
5. Perform engine testing & commissioning.
6. Perform engine installation & alignment.
7. Perform engine troubleshooting & diagnosing.
8. Supervise engine parts cleaning.
9. Supervise first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Check activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Engine
Job Title	Marine Mechanical Technical Executive (Engine)
Level	4

Job Definition :

A Marine Mechanical Technical Executive (Engine) is designated to coordinate engine preventives maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate engine preventives maintenance.
4. Coordinate engine overhauling.
5. Coordinate engine testing & commissioning.
6. Coordinate engine installation & alignment.
7. Coordinate engine troubleshooting & diagnosing.
8. Coordinate engine parts cleaning.
9. Coordinate first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Auxiliary
Job Title	Marine Mechanical Fitter (Auxiliary)
Level	1

Job Definition :

A Marine Mechanical Fitter (Auxiliary) is designated to carry out auxiliary parts cleaning, dismantle auxiliary components and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out tools, equipment & materials preparation.
3. Carry out auxiliary parts cleaning.
4. Dismantle auxiliary components.
5. Carry out first level maintenance (oiling, greasing, take reading).
6. Comply with quality assurance & quality control procedures.
7. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Auxiliary
Job Title	Marine Mechanical Technician (Auxiliary)
Level	2

Job Definition :

A Marine Mechanical Technician (Auxiliary) is designated to carry out auxiliary preventive maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out and check tools, equipment & materials preparation.
3. Carry out auxiliary preventive maintenance.
4. Carry out auxiliary overhauling.
5. Carry out & check auxiliary parts cleaning.
6. Check auxiliary components.
7. Carry out & check first level maintenance (oiling, greasing, take reading).
8. Comply with quality assurance & quality control procedures.
9. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Auxiliary
Job Title	Marine Mechanical Supervisor (Auxiliary)
Level	3

Job Definition :

A Marine Mechanical Supervisor (Auxiliary) is designated to supervise auxiliary preventive maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Supervise tools, equipment & materials preparation.
3. Supervise auxiliary preventive maintenance.
4. Supervise auxiliary ancillaries overhauling.
5. Perform auxiliary testing & commissioning.
6. Perform auxiliary installation & alignment.
7. Perform auxiliary troubleshooting & diagnosing.
8. Supervise auxiliary parts cleaning.
9. Supervise first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Check activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Auxiliary
Job Title	Marine Mechanical Technical Executive (Auxiliary)
Level	4

Job Definition :

A Marine Mechanical Technical Executive (Auxiliary) is designated to coordinate auxiliary preventive maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate auxiliary preventive maintenance.
4. Coordinate auxiliary overhauling.
5. Coordinate auxiliary testing & commissioning.
6. Coordinate auxiliary installation & alignment.
7. Coordinate auxiliary troubleshooting & diagnosing.
8. Coordinate auxiliary parts cleaning.
9. Coordinate first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Propulsion
Job Title	Marine Mechanical Fitter (Propulsion)*
Level	1

Job Definition :

A Marine Mechanical Fitter (Propulsion) is designated to carry out propulsion parts cleaning, dismantle propulsion component and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out tools, equipment & materials preparation.
3. Carry out propulsion parts cleaning.
4. Dismantle propulsion components.
5. Carry out first level maintenance (oiling, greasing, take reading).
6. Comply with quality assurance & quality control procedures.
7. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Propulsion
Job Title	Marine Mechanical Technician (Propulsion)*
Level	2

Job Definition :

A Marine Mechanical Technician (Propulsion) is designated to carry out propulsion preventive maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out and check tools, equipment & materials preparation.
3. Carry out propulsion preventive maintenance.
4. Carry out propulsion overhauling.
5. Carry out & check propulsion parts cleaning.
6. Check propulsion components.
7. Carry out & check first level maintenance (oiling, greasing, take reading).
8. Comply with quality assurance & quality control procedures.
9. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Propulsion
Job Title	Marine Mechanical Supervisor (Propulsion)*
Level	3

Job Definition :

A Marine Mechanical Supervisor (Propulsion) is designated to supervise propulsion preventive maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Supervise tools, equipment & materials preparation.
3. Supervise propulsion preventive maintenance.
4. Supervise propulsion ancillaries overhauling.
5. Perform propulsion testing & commissioning.
6. Perform propulsion installation & alignment.
7. Perform propulsion troubleshooting & diagnosing.
8. Supervise propulsion parts cleaning.
9. Supervise first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Check activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Propulsion
Job Title	Marine Mechanical Technical Executive (Propulsion)
Level	4

Job Definition :

A Marine Mechanical Technical Executive (Propulsion) is designated to coordinate propulsion preventive maintenance, overhauling, parts cleaning and first level maintenance. He has also to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate first level maintenance (oiling, greasing, take reading).
4. Coordinate propulsion parts cleaning.
5. Coordinate propulsion preventive maintenance.
6. Coordinate propulsion overhauling.
7. Coordinate propulsion testing & commissioning.
8. Coordinate propulsion installation & alignment.
9. Coordinate propulsion troubleshooting & diagnosing.
10. Comply with quality assurance & quality control procedures.
11. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Marine HVAC
Job Title	Marine Mechanical Fitter (HVAC)
Level	1

Job Definition :

A Marine Mechanical Fitter (HVAC) is designated to carry out HVAC parts cleaning, dismantle HVAC component and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out tools, equipment & materials preparation.
3. Carry out HVAC parts cleaning.
4. Dismantle HVAC components.
5. Carry out first level maintenance (oiling, greasing, take reading).
6. Comply with quality assurance & quality control procedures.
7. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Marine HVAC
Job Title	Marine Mechanical Technician (HVAC)
Level	2

Job Definition :

A Marine Mechanical Technician (HVAC) is designated to carry out HVAC preventive maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out and check tools, equipment & materials preparation.
3. Carry out HVAC preventive maintenance.
4. Carry out HVAC overhauling.
5. Carry out & check HVAC parts cleaning.
6. Check HVAC components.
7. Carry out & check first level maintenance (oiling, greasing, take reading).
8. Comply with quality assurance & quality control procedures.
9. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Marine HVAC
Job Title	Marine Mechanical Supervisor (HVAC)
Level	3

Job Definition :

A Marine Mechanical Supervisor (HVAC) is designated to supervise HVAC preventive maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Supervise tools, equipment & materials preparation.
3. Supervise HVAC preventive maintenance.
4. Supervise HVAC ancillaries overhauling.
5. Perform HVAC testing & commissioning.
6. Perform HVAC installation & alignment.
7. Perform HVAC troubleshooting & diagnosing.
8. Supervise HVAC parts cleaning.
9. Supervise first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Check activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Marine HVAC
Job Title	Marine Mechanical Technical Executive (HVAC)
Level	4

Job Definition :

A Marine Mechanical Technical Executive (HVAC) is designated to coordinate HVAC preventive maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate HVAC preventive maintenance.
4. Coordinate HVAC overhauling.
5. Coordinate HVAC testing & commissioning.
6. Coordinate HVAC installation & alignment.
7. Coordinate HVAC troubleshooting & diagnosing.
8. Coordinate HVAC parts cleaning.
9. Coordinate first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Engine, Auxiliary, Propulsion, Marine HVAC
Job Title	Marine Mechanical Manager
Level	5

Job Definition :

A Marine Mechanical Manager is designated to plan, organise, monitor & control engine, auxiliary, propulsion and marine HVAC preventive maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Monitor & control tools, equipment & materials preparation.
3. Plan & organise engine, auxiliary, propulsion and marine HVAC preventive maintenance.
4. Plan & organise engine, auxiliary, propulsion and marine HVAC overhauling.
5. Plan & organise engine, auxiliary, propulsion and marine HVAC testing & commissioning.
6. Plan & organise engine, auxiliary, propulsion and marine HVAC installation & alignment.
7. Plan & organise engine, auxiliary, propulsion and marine HVAC troubleshooting & diagnosing.
8. Monitor & control engine, auxiliary, propulsion and marine HVAC parts cleaning.
9. Monitor & control first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Endorse activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Cargo System
Job Title	Cargo System Technical Executive*
Level	4

Job Definition :

A Cargo System Technical Executive is designated to carry out cargo system testing & commissioning, sensor installation & maintenance, sensor equipment calibration, troubleshooting & diagnosing, pumping & piping installation & maintenance, tank coating regasification installation and inerting installation & maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE).
2. Carry out tools, equipment & materials preparation.
3. Carry out cargo system testing & commissioning.
4. Carry out sensor equipment installation & maintenance.
5. Adhere to quality assurance & quality control procedures.
6. Carry out sensor equipment calibration.
7. Carry out troubleshooting & diagnosing.
8. Carry out pumping & piping installation & maintenance.
9. Carry out cargo control monitoring system & inerting installation, monitoring & maintenance.
10. Carry out tank coating.
11. Prepare Cargo Control System inspection report.
12. Carry out regasification system installation, monitor & maintenance.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Mechanical
Sub Area	Cargo System
Job Title	Cargo System Manager*
Level	5

Job Definition :

A Cargo System Manager is designated to monitor & control cargo system testing & commissioning, sensor installation & maintenance, sensor equipment calibration, troubleshooting & diagnosing, pumping & piping installation & maintenance, tank coating degasification installation and inerting installation & maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE).
2. Monitor & control tools, equipment & materials preparation.
3. Monitor & control cargo system testing & commissioning.
4. Monitor & control sensor equipment installation & maintenance.
5. Adhere to quality assurance & quality control procedures.
6. Monitor & control sensor equipment calibration.
7. Monitor & control troubleshooting & diagnosing.
8. Monitor & control pumping & piping installation & maintenance.
9. Monitor & control cargo control monitoring system & inerting installation, monitoring & maintenance.
10. Monitor & control tank coating.
11. Endorse Cargo Control System inspection report.
12. Monitor & control degasification system installation, monitor & maintenance.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Preservation
Sub Area	Blasting
Job Title	Blasting Junior Technician
Level	1

Job Definition :

A Blasting Junior Technician is designated to carry out site preparation, surface preparation & blasting. He also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out site preparation.
4. Carry out surface preparation.
5. Carry out surface blasting.
6. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Preservation
Sub Area	Blasting
Job Title	Blasting Technician
Level	2

Job Definition :

A Blasting Technician is designated to carry out & check site preparation, surface preparation & blasting. He also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Carry out & check site preparation.
4. Carry out & check surface preparation.
5. Carry out & check blasting.
6. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Preservation
Sub Area	Blasting
Job Title	Blasting Supervisor
Level	3

Job Definition :

A Blasting Supervisor is designated to carry out & check site preparation, surface preparation & blasting. He also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise site preparation.
4. Supervise surface preparation.
5. Supervise surface blasting.
6. Check activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Preservation
Sub Area	Painting
Job Title	Painting Junior Technician
Level	1

Job Definition :

A Painting Junior Technician is designated to carry out site preparation, surface preparation, coating & cold fairing. He also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out site preparation.
4. Carry out surface preparation.
5. Carry out coating.
6. Carry out cold fairing.
7. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Preservation
Sub Area	Painting
Job Title	Painting Technician
Level	2

Job Definition :

A Painting Technician is designated to carry out & check site preparation, surface preparation, coating & cold fairing. He also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Carry out & check site preparation.
4. Carry out & check surface preparation.
5. Carry out & check coating.
6. Carry out & check cold fairing.
7. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Preservation
Sub Area	Painting
Job Title	Painting Supervisor
Level	3

Job Definition :

A Painting Supervisor is designated to supervise site preparation, surface preparation, coating & cold fairing. He also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise site preparation.
4. Supervise surface preparation.
5. Supervise coating.
6. Supervise cold fairing.
7. Check activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Preservation
Sub Area	Fairing
Job Title	Fairing Junior Technician (Cold Fairing)
Level	1

Job Definition :

A Fairing Junior Technician (Cold Fairing) is designated to carry out site preparation, surface preparation, cold fairing and coating. He also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out site preparation.
4. Carry out surface preparation.
5. Carry out cold fairing.
6. Carry out coating.
7. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Preservation
Sub Area	Fairing
Job Title	Fairing Technician (Cold Fairing)
Level	2

Job Definition :

A Fairing Technician (Cold Fairing) is designated to carry out & check site preparation, surface preparation, cold fairing and coating. He also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Carry out & check site preparation.
4. Carry out & check surface preparation.
5. Carry out & check cold fairing.
6. Carry out & check coating.
7. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Preservation
Sub Area	Fairing
Job Title	Fairing Supervisor (Cold Fairing)
Level	3

Job Definition :

A Fairing Supervisor (Cold Fairing) is designated to supervise site preparation, surface preparation, cold fairing and coating. He also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise site preparation.
4. Supervise surface preparation.
5. Supervise cold fairing.
6. Supervise coating.
7. Check activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Preservation
Sub Area	Blasting, Painting, Fairing
Job Title	Blasting & Painting Technical Executive
Level	4

Job Definition :

A Blasting & Painting Technical Executive are designated to coordinate site preparation, surface preparation, cold fairing, and coating and perform quality inspection. He also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate cold fairing activities.
4. Perform blasting & painting quality inspection.
5. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Building & Ship Repairing
Job Area	Preservation
Sub Area	Blasting, Painting, Fairing
Job Title	Blasting & Painting Manager
Level	5

Job Definition :

A Blasting & Painting Manager is designated to plan, organise, monitor & control site preparation, surface preparation, cold fairing, apply coating and review quality inspection. He also has to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Manage tools, equipment & materials availability.
3. Plan & organise cold fairing activities.
4. Verify blasting & painting quality inspection.
5. Verify activities report.

SECTOR : MARINE ENGINEERING INDUSTRY

SUB SECTOR : OFFSHORE FABRICATION & INSTALLATION

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Piping System
Sub Area	N/A
Job Title	Piping System Fitter*
Level	1

Job Definition :

A Piping System Fitter is designated to carry out piping system installation, fabrication, repairing and preservation applications according to quality assurance & quality control procedures. The fitter have also to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out piping system installation.
4. Carry out piping system fabrication.
5. Carry out piping system repairing.
6. Adhere to quality assurance & quality control procedures.
7. Carry out piping system preservation.
8. Update piping system installation, fabrication & repairing checklist

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Piping System
Sub Area	N/A
Job Title	Piping System Technician*
Level	2

Job Definition :

A Piping System Technician is designated to carry out and check piping system installation, fabrication, repairing and preservation applications according to quality assurance & quality control procedures. The technician has also to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Inspect tools, equipment & materials preparation.
3. Carry out complex piping system installation, fabrication and repair works.
4. Check piping system installation, fabrication and repair works.
5. Adhere to quality assurance & quality control procedures.
6. Carry out and check piping system preservation.
7. Update piping system installation, fabrication & repairing checklist

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Piping System
Sub Area	N/A
Job Title	Piping System Supervisor*
Level	3

Job Definition :

A Piping System Supervisor is designated to supervise piping system installation, fabrication, repairing and preservation applications according to quality assurance & quality control procedures. The supervisor has also to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate tools, equipment & materials preparation.
3. Supervise piping system installation activities.
4. Supervise piping system fabrication activities.
5. Supervise piping system repairing activities.
6. Adhere to quality assurance & quality control procedures.
7. Supervise piping system preservation activities.
8. Check piping system installation, fabrication & repairing report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Piping System
Sub Area	N/A
Job Title	Piping System Technical Executive
Level	4

Job Definition :

A Piping System Technical Executive is designated to monitor & control piping system installation, fabrication, repairing and preservation application activities according to quality assurance & quality control procedures. The technical executive has also to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate piping system installation & maintenance tools, equipment & materials availability.
3. Monitor & control piping system installation activities.
4. Monitor & control piping system fabrication activities.
5. Monitor & control piping system repairing activities.
6. Perform piping system installation quality assurance & quality control procedures.
7. Manage piping system preservation activities.
8. Verify piping system installation, fabrication & repairing checklist.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Piping System
Sub Area	N/A
Job Title	Piping System Manager
Level	5

Job Definition :

A Piping System Manager is designated to plan & organise piping system installation, fabrication, repairing and preservation application activities. They have also to review and endorse quality assurance & quality control procedures. The manager has also to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Evaluate & endorse tools, equipment & materials procurement.
3. Plan & organise piping system installation.
4. Plan & organise piping system fabrication.
5. Plan & organise piping system repairing.
6. Review & endorse quality assurance & quality control procedures.
7. Plan & organise piping system preservation.
8. Endorse piping system installation, fabrication & repairing checklist.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Electrical & Instrumentation
Sub Area	Electrical
Job Title	Marine Electrical Junior Technician*
Level	1

Job Definition :

A Marine Electrical Junior Technician is designated to operate switch gear, carry out preventive maintenance, installation, repairing and troubleshooting. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out switch gear operation.
4. Carry out electrical preventive maintenance activities.
5. Carry out marine electrical repairing.
6. Carry out marine electrical installation activities.
7. Adhere to quality assurance & quality control procedures.
8. Carry out marine electrical troubleshooting.
9. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Electrical & Instrumentation
Sub Area	Electrical
Job Title	Marine Electrical Technician*
Level	2

Job Definition :

A Marine Electrical Technician is designated to check switch gear operations, check preventive maintenance, installation, repairing and troubleshooting. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Check switches gear operations.
4. Check electrical preventive maintenance activities.
5. Carry out complex marine electrical installation and repair works.
6. Check marine electrical installation & repair works.
7. Adhere to quality assurance & quality control procedures.
8. Check marine electrical troubleshooting.
9. Check & update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Electrical & Instrumentation
Sub Area	Electrical
Job Title	Marine Electrical Supervisor*
Level	3

Job Definition :

A Marine Electrical Supervisor is designated to supervise switch gear operations, supervise preventive maintenance, installation, repairing and troubleshooting, perform electrical testing & commissioning and perform electrical equipment inspection & calibration. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise switch gear operations.
4. Supervise electrical preventive maintenance activities.
5. Supervise marine electrical repairing.
6. Supervise marine electrical installation activities.
7. Adhere to quality assurance & quality control procedures.
8. Supervise marine electrical troubleshooting.
9. Perform marine electrical testing & commissioning.
10. Perform marine electrical equipment inspection & calibration.
11. Check activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Electrical & Instrumentation
Sub Area	Electrical
Job Title	Marine Electrical Technical Executive
Level	4

Job Definition :

A Marine Electrical Technical Executive is designated to coordinate switch gear operations, coordinate preventive maintenance, installation, repairing and troubleshooting, verify electrical testing & commissioning and verify electrical equipment inspection & calibration. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate tools, equipment & materials availability.
3. Coordinate switch gear operations.
4. Coordinate electrical preventive maintenance activities.
5. Coordinate marine electrical repairing.
6. Coordinate marine electrical installation activities.
7. Perform quality assurance & quality control procedures.
8. Coordinate marine electrical troubleshooting.
9. Verify marine electrical equipment inspection & calibration.
10. Verify marine electrical testing & commissioning.
11. Verify activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Electrical & Instrumentation
Sub Area	Electrical
Job Title	Marine Electrical Manager
Level	5

Job Definition :

A Marine Electrical Manager is designated to monitor & control switch gear operation, plan & organise preventive maintenance, installation, repairing and troubleshooting, manage electrical testing & commissioning and review & endorse electrical equipment inspection & calibration. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Evaluate & endorse tools, equipment & materials procurements.
3. Monitor & control switch gear operation.
4. Plan & organise electrical preventive maintenance activities.
5. Plan & organise marine electrical repairing.
6. Monitor & control marine electrical installation activities.
7. Adhere to quality assurance & quality control procedures.
8. Monitor & control marine electrical troubleshooting.
9. Review & endorse design adjustment.
10. Review & endorse marine electrical equipment inspection & calibration.
11. Manage marine electrical testing & commissioning.
12. Endorse activities checklist.

Sector Marine Engineering Industry

Sub-sector Offshore Fabrication & Installation

Job Area Electrical & Instrumentation

Sub Area Instrumentation

Job Title Marine Instrumentation Junior Technician*

Level 1

Job Definition :

A Marine Instrumentation Junior Technician is designated to carry out preventive maintenance, installation, repairing and troubleshooting. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out instrumentation preventive maintenance activities.
4. Carry out marine instrumentation repairing.
5. Carry out marine instrumentation installation activities.
6. Adhere to quality assurance & quality control procedures.
7. Carry out marine instrumentation troubleshooting.
8. Update activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Electrical & Instrumentation
Sub Area	Instrumentation
Job Title	Marine Instrumentation Technician*
Level	2

Job Definition :

A Marine Instrumentation Technician is designated to check preventive maintenance, installation, repairing and troubleshooting. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Check instrumentation preventive maintenance activities.
4. Carry out marine instrumentation repairing.
5. Carry out marine instrumentation installation activities.
6. Adhere to quality assurance & quality control procedures.
7. Check marine instrumentation troubleshooting.
8. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Electrical & Instrumentation
Sub Area	Instrumentation
Job Title	Marine Instrumentation Supervisor*
Level	3

Job Definition :

A Marine Instrumentation Supervisor is designated to supervise preventive maintenance, installation, repairing and troubleshooting, perform instrumentation testing & commissioning and perform instrumentation equipment inspection & calibration. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise instrumentation preventive maintenance activities.
4. Supervise marine instrumentation repairing.
5. Supervise marine instrumentation installation activities.
6. Adhere to quality assurance & quality control procedures.
7. Supervise marine instrumentation troubleshooting.
8. Perform marine instrumentation testing & commissioning.
9. Perform marine instrumentation equipment inspection & calibration.
10. Check activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Electrical & Instrumentation
Sub Area	Instrumentation
Job Title	Marine Instrumentation Technical Executive
Level	4

Job Definition :

A Marine Instrumentation Technical Executive is designated to coordinate preventive maintenance, installation, repairing and troubleshooting, verify instrumentation testing & commissioning and verify instrumentation equipment inspection & calibration. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Verify tools, equipment & materials preparation.
3. Coordinate instrumentation preventive maintenance activities.
4. Coordinate marine instrumentation repairing.
5. Coordinate marine instrumentation installation activities.
6. Adhere to quality assurance & quality control procedures.
7. Coordinate marine instrumentation troubleshooting.
8. Verify marine instrumentation equipment inspection & calibration
9. Verify marine instrumentation testing & commissioning.
10. Perform system integration development.
11. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Electrical & Instrumentation
Sub Area	Instrumentation
Job Title	Marine Instrumentation Manager
Level	5

Job Definition :

A Marine Instrumentation Manager is designated to monitor & control switch gear operations, plan & organise preventive maintenance, installation, repairing and troubleshooting, manage instrumentation testing & commissioning and review & endorse instrumentation equipment inspection & calibration. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Review & endorse tools, equipment & materials preparation.
3. Plan & organise instrumentation preventive maintenance activities.
4. Plan & organise marine instrumentation repairing.
5. Monitor & control marine instrumentation installation activities.
6. Adhere to quality assurance & quality control procedures.
7. Monitor & control marine instrumentation troubleshooting.
8. Review & endorse design adjustment.
9. Review & endorse marine instrumentation equipment inspection & calibration.
10. Plan & organise system integration development.
11. Manage marine instrumentation testing & commissioning.
12. Endorse activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Structure
Sub Area	Steel
Job Title	Marine Structure Fitter*
Level	1

Job Definition :

A Marine Structure Fitter is designated to carry out steel cutting, repairing, installation, marking and fabrication. He also has to comply with quality assurance & control requirement and adhere to safety, health and environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out steel cutting.
4. Carry out steel repair.
5. Carry out ship hull steel installation.
6. Adhere to quality assurance & quality control procedures.
7. Carry out steel marking.
8. Install cathodic protection.
9. Carry out steel fabrication.
10. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Structure
Sub Area	Steel
Job Title	Marine Structure Technician*
Level	2

Job Definition :

A Marine Structure Technician is designated to inspect steel cutting, repairing, installation, marking and fabrication. He also has to comply with quality assurance & control requirement and adhere to safety, health and environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Inspect steel cutting.
4. Carry out steel repair.
5. Carry out & check ship hull steel installation.
6. Adhere to quality assurance & quality control procedures.
7. Carry out and check steel marking.
8. Check cathodic protection application activities.
9. Carry out & check steel fabrication.
10. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Structure
Sub Area	Steel
Job Title	Marine Structure Supervisor*
Level	3

Job Definition :

A Marine Structure Supervisor is designated to supervise steel cutting, repairing, installation, marking and fabrication. He also has to comply with quality assurance & control procedures and adhere to safety, health and environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise steel cutting.
4. Carry out steel testing.
5. Supervise steel repair.
6. Supervise & check ship hull steel installation.
7. Adhere to quality assurance & quality control procedures
8. Supervise and check steel marking.
9. Supervise cathodic protection installation.
10. Carry out module assembly.
11. Supervise & check steel fabrication.
12. Check activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Structure
Sub Area	Steel
Job Title	Marine Structure Technical Executive
Level	4

Job Definition :

A Marine Structure Technical Executive is designated to coordinate steel cutting, repairing, installation, marking and fabrication. He also has to comply with quality assurance & control procedures and adhere to safety, health and environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate steel structure construction.
4. Coordinate steel structure testing.
5. Coordinate steel structure repair.
6. Adhere to quality assurance & quality control procedures
7. Coordinate cathodic protection installation.
8. Perform steel structure system integration.
9. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Structure
Sub Area	Steel
Job Title	Marine Structure Manager
Level	5

Job Definition :

A Marine Structure Manager is designated to monitor & control steel cutting, repairing, installation, marking and fabrication. He also has to comply with quality assurance & control procedures and adhere to safety, health and environmental requirements.

Job Description :

1. Plan and monitor to Safety, Health & Environmental (SHE) requirements.
2. Plan and monitor tools, equipment & materials preparation.
3. Plan and monitor steel structure construction.
4. Plan and monitor steel structure testing.
5. Coordinate steel structure repair.
6. Adhere to quality assurance & quality control procedures
7. Plan and monitor cathodic protection installation.
8. Perform steel structure system integration.
9. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Engine
Job Title	Marine Mechanical Fitter (Engine)*
Level	1

Job Definition :

A Marine Mechanical Fitter (Engine) is designated to carry out engine parts cleaning, dismantle engine component and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out tools, equipment & materials preparation.
3. Carry out engine parts cleaning.
4. Dismantle engine components.
5. Carry out first level maintenance (oiling, greasing, take reading).
6. Comply with quality assurance & quality control procedures.
7. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Engine
Job Title	Marine Mechanical Technician (Engine)*
Level	2

Job Definition :

A Marine Mechanical Technician (Engine) is designated to carry out preventives maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out and check tools, equipment & materials preparation.
3. Carry out engine preventives maintenance.
4. Carry out engine & ancillaries overhauling.
5. Carry out & check engine parts cleaning.
6. Check engine components.
7. Carry out & check first level maintenance (oiling, greasing, take reading).
8. Comply with quality assurance & quality control procedures.
9. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Engine
Job Title	Marine Mechanical Supervisor (Engine)*
Level	3

Job Definition :

A Marine Mechanical Supervisor (Engine) is designated to supervise preventives maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Supervise tools, equipment & materials preparation.
3. Supervise engine preventives maintenance.
4. Supervise engine & ancillaries overhauling.
5. Perform engine testing & commissioning.
6. Perform engine installation & alignment.
7. Perform engine troubleshooting & diagnostics.
8. Supervise engine parts cleaning.
9. Supervise first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Check activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Engine
Job Title	Marine Mechanical Technical Executive (Engine)
Level	4

Job Definition :

A Marine Mechanical Technical Executive (Engine) is designated to coordinate preventives maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate engine preventives maintenance.
4. Coordinate engine & ancillaries overhauling.
5. Coordinate engine testing & commissioning.
6. Coordinate engine installation & alignment.
7. Coordinate engine troubleshooting & diagnostics.
8. Coordinate engine parts cleaning.
9. Coordinate first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Auxiliary
Job Title	Marine Mechanical Fitter (Auxiliary)*
Level	1

Job Definition :

A Marine Mechanical Fitter (Auxiliary) is designated to carry out auxiliary parts cleaning, dismantle auxiliary component and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out tools, equipment & materials preparation.
3. Carry out auxiliary parts cleaning.
4. Dismantle auxiliary components.
5. Carry out first level maintenance (oiling, greasing, take reading).
6. Comply with quality assurance & quality control procedures.
7. Carry out pneumatic & hydraulic control system maintenance.
8. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Auxiliary
Job Title	Marine Mechanical Technician (Auxiliary)*
Level	2

Job Definition :

A Marine Mechanical Technician (Auxiliary) is designated to carry out preventives maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out and check tools, equipment & materials preparation.
3. Carry out auxiliary preventives maintenance.
4. Carry out auxiliary & ancillaries overhauling.
5. Carry out & check auxiliary parts cleaning.
6. Check auxiliary components.
7. Carry out & check first level maintenance (oiling, greasing, take reading).
8. Comply with quality assurance & quality control procedures.
9. Carry out pneumatic & hydraulic control system maintenance.
10. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Auxiliary
Job Title	Marine Mechanical Supervisor (Auxiliary)*
Level	3

Job Definition :

A Marine Mechanical Supervisor (Auxiliary) is designated to supervise preventives maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Supervise tools, equipment & materials preparation.
3. Supervise auxiliary preventives maintenance.
4. Supervise auxiliary & ancillaries overhauling.
5. Perform auxiliary testing & commissioning.
6. Perform auxiliary installation & alignment.
7. Perform auxiliary troubleshooting & diagnostics.
8. Supervise auxiliary parts cleaning.
9. Supervise first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Supervise pneumatic & hydraulic control system maintenance.
12. Check activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Auxiliary
Job Title	Marine Mechanical Technical Executive (Auxiliary)
Level	4

Job Definition :

A Marine Mechanical Technical Executive (Auxiliary) is designated to coordinate preventives maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate auxiliary preventives maintenance.
4. Coordinate auxiliary& ancillaries overhauling.
5. Coordinate auxiliary testing & commissioning.
6. Coordinate auxiliary installation & alignment.
7. Coordinate auxiliary troubleshooting & diagnostics.
8. Coordinate auxiliary parts cleaning.
9. Coordinate first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Coordinate pneumatic & hydraulic control system maintenance.
12. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Propulsion
Job Title	Marine Mechanical Fitter (Propulsion)*
Level	1

Job Definition :

A Marine Mechanical Fitter (Propulsion) is designated to carry out propulsion parts cleaning, dismantle propulsion component and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out tools, equipment & materials preparation.
3. Carry out propulsion parts cleaning.
4. Dismantle propulsion components.
5. Carry out first level maintenance (oiling, greasing, take reading).
6. Comply with quality assurance & quality control procedures.
7. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Propulsion
Job Title	Marine Mechanical Technician (Propulsion)*
Level	2

Job Definition :

A Marine Mechanical Technician (Propulsion) is designated to carry out preventives maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Carry out and check tools, equipment & materials preparation.
3. Carry out propulsion preventives maintenance.
4. Carry out propulsion& steering gear equipment maintenance.
5. Carry out & check propulsion parts cleaning.
6. Check propulsion components.
7. Carry out & check first level maintenance (oiling, greasing, take reading).
8. Comply with quality assurance & quality control procedures.
9. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Propulsion
Job Title	Marine Mechanical Supervisor (Propulsion)*
Level	3

Job Definition :

A Marine Mechanical Supervisor (Propulsion) is designated to supervise preventives maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Supervise tools, equipment & materials preparation.
3. Supervise propulsion preventives maintenance.
4. Supervise propulsion& steering gear equipment maintenance.
5. Perform propulsion testing & commissioning.
6. Perform propulsion installation & alignment.
7. Perform propulsion troubleshooting & diagnostics.
8. Supervise propulsion parts cleaning.
9. Supervise first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Check activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Propulsion
Job Title	Marine Mechanical Technical Executive (Propulsion)
Level	4

Job Definition :

A Marine Mechanical Technical Executive (Propulsion) is designated to coordinate preventives maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate propulsion preventives maintenance.
4. Coordinate propulsion& steering gear equipment maintenance.
5. Coordinate propulsion testing & commissioning.
6. Coordinate propulsion installation & alignment.
7. Coordinate propulsion troubleshooting & diagnostics.
8. Coordinate propulsion parts cleaning.
9. Coordinate first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Marine HVAC
Job Title	Marine Mechanical Fitter (HVAC)*
Level	1

Job Definition :

A Marine Mechanical Fitter (HVAC) is designated to carry out equipment installation, maintenance, citadel monitoring and control. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE).
2. Carry out tools, equipment & materials preparation.
3. Carry out HVAC equipment installation & maintenance.
4. Carry out HVAC control & monitoring system installation & maintenance.
5. Carry out citadel monitoring and control.
6. Comply with quality assurance & quality control procedures.
7. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Marine HVAC
Job Title	Marine Mechanical Technician (HVAC)*
Level	2

Job Definition :

A Marine Mechanical Technician (HVAC) is designated to carry out and check equipment installation, maintenance, citadel monitoring and control. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE).
2. Carry out and check tools, equipment & materials preparation.
3. Carry out preventives maintenance.
4. Carry out and check HVAC equipment installation & maintenance.
5. Carry out and check HVAC control & monitoring system installation & maintenance.
6. Carry out citadel monitoring and control.
7. Comply with quality assurance & quality control procedures.
8. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Marine HVAC
Job Title	Marine Mechanical Supervisor (HVAC)*
Level	3

Job Definition :

A Marine Mechanical Supervisor (HVAC) is designated to supervise equipment installation, maintenance, citadel monitoring and control. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE).
2. Supervise tools, equipment & materials preparation.
3. Supervise preventives maintenance.
4. Supervise HVAC equipment installation & maintenance.
5. Carry out testing & commissioning.
6. Carry out installation & alignment.
7. Supervise HVAC control & monitoring system installation & maintenance.
8. Carry out troubleshooting & diagnostics.
9. Carry out citadel monitoring and control.
10. Comply with quality assurance & quality control procedures.
11. Check activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Marine HVAC
Job Title	Marine Mechanical Technical Executive (HVAC)
Level	4

Job Definition :

A Marine Mechanical Technical Executive (HVAC) is designated to coordinate equipment installation, maintenance, citadel monitoring and control. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE).
2. Coordinate tools, equipment & materials preparation.
3. Coordinate preventives maintenance.
4. Coordinate HVAC equipment installation & maintenance.
5. Coordinate testing & commissioning.
6. Coordinate installation & alignment.
7. Coordinate HVAC control & monitoring system installation & maintenance.
8. Carry out troubleshooting & diagnostics.
9. Coordinate citadel monitoring and control.
10. Comply with quality assurance & quality control procedures.
11. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Mechanical
Sub Area	Engine, Auxiliary, Propulsion, Marine HVAC
Job Title	Marine Mechanical Manager
Level	5

Job Definition :

A Marine Mechanical Manager is designated to plan, organise, monitor & control engine, auxiliary, propulsion and marine HVAC preventive maintenance, overhauling, parts cleaning and first level maintenance. He also has to comply with quality assurance & control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) procedures.
2. Monitor & control tools, equipment & materials preparation.
3. Plan & organise engine, auxiliary, propulsion and marine HVAC preventive maintenance.
4. Plan & organise engine, auxiliary, propulsion and marine HVAC overhauling.
5. Plan & organise engine, auxiliary, propulsion and marine HVAC testing & commissioning.
6. Plan & organise engine, auxiliary, propulsion and marine HVAC installation & alignment.
7. Plan & organise engine, auxiliary, propulsion and marine HVAC troubleshooting & diagnosing.
8. Monitor & control engine, auxiliary, propulsion and marine HVAC parts cleaning.
9. Monitor & control first level maintenance (oiling, greasing, take reading).
10. Comply with quality assurance & quality control procedures.
11. Endorse activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Outfitting
Sub Area	N/A
Job Title	Accommodation & Outfitting Fitter*
Level	1

Job Definition :

An Accommodation & Outfitting Fitter is designated to carry out marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Carry out marking for outfitting works.
4. Carry out fitting activities.
5. Carry out fittings repair.
6. Adhere to quality control procedures.
7. Carry out cutting activities.
8. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Outfitting
Sub Area	N/A
Job Title	Accommodation & Outfitting Technician*
Level	2

Job Definition :

An Accommodation & Outfitting Technician is designated to carry out and check marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Carry out marking works.
4. Check repair works.
5. Adhere to quality control procedures.
6. Check fitting quality.
7. Update activities checklist.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Outfitting
Sub Area	N/A
Job Title	Accommodation & Outfitting Supervisor*
Level	3

Job Definition :

An Accommodation & Outfitting Supervisor is designated to supervise marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Supervise marking activities.
4. Supervise repair works.
5. Adhere to quality control procedures.
6. Supervise fitting activities.
7. Check activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Outfitting
Sub Area	N/A
Job Title	Accommodation & Outfitting Technical Executive
Level	4

Job Definition :

An Accommodation & Outfitting Technical Executive is designated to coordinate marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate marking.
4. Coordinate repair.
5. Adhere to quality control procedures.
6. Coordinate fitting activities.
7. Coordinate cutting activities.
8. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Outfitting
Sub Area	N/A
Job Title	Accommodation & Outfitting Manager
Level	5

Job Definition :

An Accommodation & Outfitting Manager is designated to monitor & control marking, repair, fitting & cutting. He also has to comply with quality control procedures & adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Monitor & control tools, equipment & materials preparation.
3. Monitor & control fabrication.
4. Monitor & control marking.
5. Monitor & control repair.
6. Adhere to quality control procedures.
7. Monitor & control fitting activities.
8. Monitor & control cutting activities.
9. Endorse activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Preservation
Sub Area	Blasting
Job Title	Blasting Junior Technician
Level	1

Job Definition :

A Blasting Junior Technician is designated to carry out site preparation, surface preparation & blasting. He also has to comply with quality control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Adhere to quality control procedures.
4. Carry out site preparation.
5. Carry out surface preparation.
6. Carry out surface blasting.
7. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Preservation
Sub Area	Blasting
Job Title	Blasting Technician
Level	2

Job Definition :

A Blasting Technician is designated to carry out & check site preparation, surface preparation & blasting. He also has to comply with quality control procedures and to adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check tools, equipment & materials preparation.
3. Adhere to quality control procedures
4. Carry out & check site preparation.
5. Carry out & check surface preparation.
6. Carry out & check blasting.
7. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Preservation
Sub Area	Blasting
Job Title	Blasting Supervisor
Level	3

Job Definition :

A Blasting Supervisor is designated to carry out & check site preparation, surface preparation & blasting. He also has to comply with quality control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Adhere to quality control procedures
4. Supervise site preparation.
5. Supervise surface preparation.
6. Supervise surface blasting.
7. Check activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Preservation
Sub Area	Painting
Job Title	Painting Junior Technician
Level	1

Job Definition :

A Painting Junior Technician is designated to carry out site preparation, surface preparation, coating & cold fairing. He also has to comply with quality control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out tools, equipment & materials preparation.
3. Adhere to quality control procedures
4. Carry out site preparation.
5. Carry out surface preparation.
6. Carry out coating.
7. Carry out cold fairing.
8. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Preservation
Sub Area	Painting
Job Title	Painting Technician
Level	2

Job Definition :

A Painting Technician is designated to carry out & check site preparation, surface preparation, coating & cold fairing. He also has to comply with quality control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Carry out & check tools, equipment & materials preparation.
3. Adhere to quality control procedures
4. Carry out & check site preparation.
5. Carry out & check surface preparation.
6. Carry out & check coating.
7. Carry out & check cold fairing.
8. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Preservation
Sub Area	Painting
Job Title	Painting Supervisor
Level	3

Job Definition :

A Painting Supervisor is designated to supervise site preparation, surface preparation, coating & cold fairing. He also has to comply with quality control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Supervise tools, equipment & materials preparation.
3. Adhere to quality control procedures
4. Supervise site preparation.
5. Supervise surface preparation.
6. Supervise coating.
7. Supervise cold fairing.
8. Check activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Preservation
Sub Area	Blasting, Painting
Job Title	Blasting & Painting Technical Executive
Level	4

Job Definition :

A Blasting & Painting Technical Executive are designated to coordinate site preparation, surface preparation, cold fairing, and coating and perform quality inspection. He also has to comply with quality control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Coordinate tools, equipment & materials preparation.
3. Coordinate cold fairing activities.
4. Perform blasting & painting quality inspection.
5. Adhere to quality control procedures
6. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Offshore Fabrication & Installation
Job Area	Preservation
Sub Area	Blasting, Painting
Job Title	Blasting & Painting Manager
Level	5

Job Definition :

A Blasting & Painting Manager is designated to plan, organise, monitor & control site preparation, surface preparation, cold fairing, and coating and review quality inspection. He also has to comply with quality control procedures and adhere to safety, health & environmental requirements.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Manage tools, equipment & materials availability.
3. Plan & organise cold fairing activities.
4. Verify blasting & painting quality inspection.
5. Adhere to quality control procedures
6. Verify activities report.

SECTOR : MARINE ENGINEERING INDUSTRY

SUB SECTOR : SHIP & OFFSHORE DESIGNING

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Naval Architecture
Job Title	Draughtsman*
Level	3

Job Definition :

A Draughtsman is designated to prepare CAD drawings general arrangement, showing the detail and assembly of arrangement, prepare structure drawing, hull outfitting drawing and accommodation carpentry drawing.

Job Description :

1. Prepare general/ structure/ hull outfitting and accommodation technical specification.
2. Prepare general/ structure/ hull outfitting and accommodation drawing list.
3. Prepare general/ structure/ hull outfitting and accommodation preliminary cad drawing.
4. Prepare general/ structure/ hull outfitting and accommodation detail drawing.
5. Prepare general/ structure/ hull outfitting and accommodation design approval.
6. Prepare general/ structure/ hull outfitting and accommodation Material Take Out (MTO).
7. Prepare general/ structure/ hull outfitting and accommodation production drawing.
8. Prepare general/ structure/ hull outfitting and accommodation as built drawing.
9. Prepare general/ structure/ hull outfitting and accommodation activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Naval Architecture
Job Title	Ship Designer*
Level	4

Job Definition :

A Ship Designer is designated to coordinate CAD drawings general arrangement, showing the detail and assembly of arrangement, prepare structure drawing, hull outfitting drawing and accommodation carpentry drawing.

Job Description :

1. Coordinate general/ structure/ hull outfitting and accommodation technical specification.
2. Coordinate general/ structure/ hull outfitting and accommodation drawing list.
3. Coordinate general/ structure/ hull outfitting and accommodation preliminary CAD drawing.
4. Coordinate general/ structure/ hull outfitting and accommodation detail drawing.
5. Coordinate general/ structure/ hull outfitting and accommodation design approval.
6. Coordinate general/ structure/ hull outfitting and accommodation Material Take Out (MTO).
7. Coordinate general/ structure/ hull outfitting and accommodation production drawing.
8. Coordinate general/ structure/ hull outfitting and accommodation as built drawing.
9. Coordinate general/ structure/ hull outfitting and accommodation activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Naval Architecture
Job Title	Assistant Naval Architect*
Level	5

Job Definition :

An Assistant Naval Architect is designated to review and endorse CAD drawings general arrangement, showing the detail and assembly of arrangement, prepare structure drawing, hull outfitting drawing and accommodation carpentry drawing.

Job Description :

1. Review and endorse general/ structure/ hull outfitting and accommodation technical specification.
2. Review and endorse general/ structure/ hull outfitting and accommodation drawing list.
3. Review and endorse general/ structure/ hull outfitting and accommodation preliminary CAD drawing.
4. Review and endorse general/ structure/ hull outfitting and accommodation detail drawing.
5. Review and endorse general/ structure/ hull outfitting and accommodation design approval.
6. Review and endorse general/ structure/ hull outfitting and accommodation material take out (MTO).
7. Review and endorse general/ structure/ hull outfitting and accommodation production drawing.
8. Review and endorse general/ structure/ hull outfitting and accommodation as built drawing.
9. Review and endorse general/ structure/ hull outfitting and accommodation activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Naval Architecture
Job Title	Naval Architect
Level	6

Job Definition :

A Naval Architect is designated to endorse, review, plan &organise concept design, design calculation, hull form design, technical specification endorsing, vessel construction monitoring & control and endorse preliminary, detail & production as built drawing.

Job Description :

1. Evaluate Safety, Health & Environmental (SHE) compliance assessment design.
2. Produce concept design.
3. Carry out vessel design calculation.
4. Endorse preliminary, detail, production & as built drawing.
5. Verify technical specification.
6. Produce hull form design.
7. Monitor & control vessel construction.
8. Plan & organise testing & commissioning procedures.
9. Coordinate vessel design approval.
10. Endorse Material Take Out (MTO) list.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Naval Architecture
Job Title	Chief Naval Architect
Level	7

Job Definition :

A Chief Naval Architect is designated to approve, manage & organise concept design, design calculation, hull form design, technical specification approving, vessel construction organising & management and approve preliminary, detail & production as built drawing.

Job Description :

1. Endorse Safety, Health & Environmental (SHE) compliance assessment design.
2. Approve concept design.
3. Approve vessel design calculation.
4. Endorse preliminary, detail, production & as built drawing.
5. Endorse technical specification.
6. Approve hull form design.
7. Consult & manage vessel construction.
8. Organise & manage testing & commissioning procedures.
9. Present vessel design for approval.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Naval Architecture
Job Title	Naval Architecture Specialist
Level	8

Job Definition :

A Naval Architecture Specialist is designated to recommend, provide & plan concept design, design calculation, hull form design, technical specification recommendation, vessel construction monitoring and approve preliminary, detail & production as built drawing.

Job Description :

1. Provide consultation on Safety, Health & Environmental (SHE) compliance assessment design.
2. Provide consultation on concept design on new vessel.
3. Recommend technical specification.
4. Provide consultation on hull form design.
5. Provide consultation on vessel construction.
6. Provide consultation on testing & commissioning procedures.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Electrical & Instrumentation (Electrical)
Job Title	Electrical Draughtsman*
Level	3

Job Definition :

An Electrical Draughtsman is designated to prepare CAD drawings electrical arrangement, showing the detail and assembly of electrical equipment devices, indicating dimensions, fastening methods, prepare single line drawing.

Job Description :

1. Prepare electrical technical specification.
2. Prepare electrical drawing list.
3. Prepare electrical preliminary cad drawing.
4. Prepare electrical detail drawing.
5. Prepare electrical design approval.
6. Prepare electrical Material Take Out (MTO)
7. Prepare electrical production drawing.
8. Prepare electrical as built drawing.
9. Prepare electrical activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Electrical & Instrumentation (Electrical)
Job Title	Electrical Designer*
Level	4

Job Definition :

An Electrical Designer is designated to coordinate CAD drawings electrical arrangement, showing the detail and assembly of electrical equipment devices, indicating dimensions, fastening methods, prepare single line drawing.

Job Description :

1. Coordinate electrical technical specification.
2. Coordinate electrical drawing list.
3. Coordinate electrical preliminary CAD drawing.
4. Coordinate electrical detail drawing.
5. Coordinate electrical design approval.
6. Coordinate electrical Material Take Out (MTO).
7. Coordinate electrical production drawing.
8. Coordinate electrical as built drawing.
9. Coordinate electrical activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Electrical & Instrumentation (Electrical)
Job Title	Electrical Senior Designer*
Level	5

Job Definition :

An Electrical Senior Designer is designated to review and endorse CAD drawings electrical arrangement, showing the detail and assembly of electrical equipment devices, indicating dimensions, fastening methods, prepare single line drawing.

Job Description :

1. Review and endorse electrical technical specification.
2. Review and endorse electrical drawing list.
3. Review and endorse electrical preliminary CAD drawing.
4. Review and endorse electrical detail drawing.
5. Review and endorse electrical design approval.
6. Review and endorse electrical Material Take Out (MTO).
7. Review and endorse electrical production drawing.
8. Review and endorse electrical as built drawing.
9. Review and endorse electrical activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Electrical & Instrumentation (Electrical)
Job Title	Electrical Design Manager
Level	6

Job Definition :

An Electrical Design Manager is designated to review, plan & approve load calculation, technical specification, electrical installation management, testing & commissioning procedures, design approval management and system integration planning.

Job Description :

1. Approve Safety, Health & Environmental (SHE) compliance assessment.
2. Review & endorse electrical load calculation.
3. Plan preliminary, detail, production & as built drawing.
4. Approve electrical technical specification.
5. Manage electrical installation.
6. Monitor testing & commissioning procedures.
7. Manage electrical system design approval.
8. Approve Material Take Out (MTO) list.
9. Analyse system integration.
10. Plan electrical system design.
11. Approve activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Electrical & Instrumentation (Electrical)
Job Title	Electrical Chief Design Manager
Level	7

Job Definition :

An Electrical Chief Design Manager is designated to recommend, provide & conduct load calculation, technical specification, electrical installation management, testing & commissioning procedures monitoring, design approval management and system integration planning.

Job Description :

1. Recommend Safety, Health & Environmental (SHE) compliance assessment.
2. Recommend electrical load calculation.
3. Recommend preliminary, detail, production & as built drawing.
4. Provide electrical technical specification.
5. Conduct electrical installation.
6. Conduct testing & commissioning procedures.
7. Manage electrical system design approval.
8. Plan Material Take Out (MTO) list.
9. Recommend system integration.
10. Recommend electrical system design.
11. Approve activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Electrical & Instrumentation (Electrical)
Job Title	Electrical Design Specialist
Level	8

Job Definition :

An Electrical Design Specialist is designated to recommend, provide & plan concept design, design calculation, electrical form design, technical specification recommendation, electrical installation monitoring and approve preliminary, detail & production as built drawing.

Job Description :

1. Provide consultation on Safety, Health & Environmental (SHE) compliance assessment design.
2. Provide consultation on concept design on electrical design.
3. Recommend technical specification.
4. Provide consultation on electrical form design.
5. Provide consultation on electrical installation.
6. Provide consultation on testing & commissioning procedures.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Electrical & Instrumentation (Instrumentation)
Job Title	Instrumentation Draughtsman*
Level	3

Job Definition :

An Instrumentation Draughtsman is designated to prepare CAD drawings instrumentation arrangement, showing the detail and assembly of instrumentation equipment devices, indicating dimensions, fastening methods, prepare instrumentation single line drawing.

Job Description :

1. Prepare instrumentation technical specification.
2. Prepare instrumentation drawing list.
3. Prepare instrumentation preliminary CAD drawing.
4. Prepare instrumentation detail drawing.
5. Prepare instrumentation design approval.
6. Prepare instrumentation Material Take Out (MTO).
7. Prepare instrumentation production drawing.
8. Prepare instrumentation as built drawing.
9. Prepare instrumentation activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Electrical & Instrumentation (Instrumentation)
Job Title	Instrumentation Designer*
Level	4

Job Definition :

An Instrumentation Designer is designated to coordinate CAD drawings instrumentation arrangement, showing the detail and assembly of instrumentation equipment devices, indicating dimensions, fastening methods, prepare instrumentation single line drawing.

Job Description :

1. Coordinate instrumentation technical specification.
2. Coordinate instrumentation drawing list.
3. Coordinate instrumentation preliminary CAD drawing.
4. Coordinate instrumentation detail drawing.
5. Coordinate instrumentation design approval.
6. Coordinate instrumentation Material Take Out (MTO)
7. Coordinate instrumentation production drawing.
8. Coordinate instrumentation as built drawing.
9. Coordinate instrumentation activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Electrical & Instrumentation (Instrumentation)
Job Title	Instrumentation Senior Designer*
Level	5

Job Definition :

An Instrumentation Senior Designer is designated to review and endorse CAD drawings instrumentation arrangement, showing the detail and assembly of instrumentation equipment devices, indicating dimensions, fastening methods, prepare instrumentation single line drawing.

Job Description :

1. Review and endorse instrumentation technical specification.
2. Review and endorse instrumentation drawing list.
3. Review and endorse instrumentation preliminary CAD drawing.
4. Review and endorse instrumentation detail drawing.
5. Review and endorse instrumentation design approval.
6. Review and endorse instrumentation Material Take Out (MTO)
7. Review and endorse instrumentation production drawing.
8. Review and endorse instrumentation as built drawing.
9. Review and endorse instrumentation activities report.

Notes:

***Critical Job Title**

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Electrical & Instrumentation (Instrumentation)
Job Title	Instrumentation Design Manager
Level	6

Job Definition :

An Instrumentation Design Manager is designated to review, plan & approve load calculation, technical specification, instrumentation installation management, testing & commissioning procedures monitoring, design approval management and system integration planning.

Job Description :

1. Approve Safety, Health & Environmental (SHE) compliance assessment.
2. Review & endorse instrumentation load calculation.
3. Plan preliminary, detail, production & as built drawing.
4. Approve instrumentation technical specification.
5. Manage instrumentation installation.
6. Monitor testing & commissioning procedures.
7. Manage instrumentation system design approval.
8. Approve Material Take Out (MTO) list.
9. Analyse system integration.
10. Plan instrumentation system design.
11. Approve activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Electrical & Instrumentation (Instrumentation)
Job Title	Instrumentation Chief Design Manager
Level	7

Job Definition :

An Instrumentation Chief Design Manager is designated to recommend, provide & conduct load calculation, technical specification, instrumentation installation management, testing & commissioning procedures monitoring, design approval management and system integration planning.

Job Description :

1. Recommend Safety, Health & Environmental (SHE) compliance assessment.
2. Recommend instrumentation load calculation.
3. Recommend preliminary, detail, production & as built drawing.
4. Provide instrumentation technical specification.
5. Conduct instrumentation installation.
6. Conduct testing & commissioning procedures.
7. Manage instrumentation system design approval.
8. Plan Material Take Out (MTO) list.
9. Recommend system integration.
10. Recommend instrumentation system design.
11. Approve activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Electrical & Instrumentation (Instrumentation)
Job Title	Instrumentation Design Specialist
Level	8

Job Definition :

An Instrumentation Design Specialist is designated to recommend, provide & plan concept design, design calculation, instrumentation form design, technical specification recommendation, instrumentation installation monitoring and approve preliminary, detail & production as built drawing.

Job Description :

1. Provide consultation on Safety, Health & Environmental (SHE) compliance assessment design.
2. Provide consultation on concept design on instrumentation design.
3. Recommend technical specification.
4. Provide consultation on instrumentation form design.
5. Provide consultation on instrumentation installation.
6. Provide consultation on testing & commissioning procedures.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Mechanical (Piping / Machinery)
Job Title	Piping / Machinery Draughtsman
Level	3

Job Definition :

A Piping / Machinery Draughtsman is designated to prepare CAD drawings machinery arrangement, showing the detail and assembly of machinery and mechanical devices, indicating dimensions, fastening methods, prepare process and piping systems drawing, piping layout and piping isometric drawing, and HVAC drawing

Job Description :

1. Prepare piping/ machinery/ HVAC technical specification.
2. Prepare piping/ machinery/ HVAC drawing list.
3. Prepare piping/ machinery/ HVAC preliminary CAD drawing.
4. Prepare piping/ machinery/ HVAC detail drawing.
5. Prepare piping/ machinery/ HVAC design approval.
6. Prepare piping/ machinery/ HVAC Material Take Out (MTO).
7. Prepare piping/ machinery/ HVAC production drawing.
8. Prepare piping/ machinery/ HVAC as built drawing.
9. Prepare piping/ machinery/ HVAC activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Mechanical (Piping / Machinery)
Job Title	Piping / Machinery Designer
Level	4

Job Definition :

A Piping/ Machinery Designer is designated to coordinate CAD drawings machinery arrangement, showing the detail and assembly of machinery and mechanical devices, indicating dimensions, fastening methods, prepare process and piping systems drawing, piping layout and piping isometric drawing, and HVAC drawing

Job Description :

1. Coordinate piping/ machinery/ HVAC technical specification.
2. Coordinate piping/ machinery/ HVAC drawing list.
3. Coordinate piping/ machinery/ HVAC preliminary CAD drawing.
4. Coordinate piping/ machinery/ HVAC detail drawing.
5. Coordinate piping/ machinery/ HVAC design approval.
6. Coordinate piping/ machinery/ HVAC material take out (MTO).
7. Coordinate piping/ machinery/ HVAC production drawing.
8. Coordinate piping/ machinery/ HVAC as built drawing.
9. Coordinate piping/ machinery/ HVAC activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Mechanical (Piping / Machinery)
Job Title	Piping / Machinery Senior Designer
Level	5

Job Definition :

A Piping / Machinery Senior Designer is designated to review and endorse CAD drawings machinery arrangement, showing the detail and assembly of machinery and mechanical devices, indicating dimensions, fastening methods, prepare process and piping systems drawing, piping layout and piping isometric drawing, and HVAC drawing

Job Description :

1. Review and endorse piping/ machinery/ HVAC technical specification.
2. Review and endorse piping/ machinery/ HVAC drawing list.
3. Review and endorse piping/ machinery/ HVAC preliminary CAD drawing.
4. Review and endorse piping/ machinery/ HVAC detail drawing.
5. Review and endorse piping/ machinery/ HVAC design approval.
6. Review and endorse piping/ machinery/ HVAC Material Take Out (MTO).
7. Review and endorse piping/ machinery/ HVAC production drawing.
8. Review and endorse piping/ machinery/ HVAC as built drawing.
9. Review and endorse piping/ machinery/ HVAC activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Mechanical (Piping / Machinery)
Job Title	Piping / Machinery Design Manager
Level	6

Job Definition :

A Piping/ Machinery Design Manager is designated to review, plan & approve flow calculation, technical specification, piping installation management, testing & commissioning procedures monitoring, design approval management and system integration planning.

Job Description :

1. Approve Safety, Health & Environmental (SHE) compliance assessment.
2. Review & endorse piping flow calculation.
3. Plan preliminary, detail, production & as built drawing.
4. Approve piping technical specification.
5. Manage piping installation.
6. Monitor testing & commissioning procedures.
7. Manage piping system design approval.
8. Approve Material Take Out (MTO) list.
9. Analyse system integration.
10. Plan piping system design.
11. Approve activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Mechanical (Piping / Machinery)
Job Title	Piping / Machinery Chief Design Manager
Level	7

Job Definition :

A Piping/ Machinery Chief Design Manager is designated to recommend, provide & conduct flow calculation, technical specification, piping installation management, testing & commissioning procedures monitoring, design approval management and system integration planning.

Job Description :

1. Recommend Safety, Health & Environmental (SHE) compliance assessment.
2. Recommend piping load calculation.
3. Recommend preliminary, detail, production & as built drawing.
4. Provide piping technical specification.
5. Conduct piping installation.
6. Conduct testing & commissioning procedures.
7. Manage piping system design approval.
8. Plan Material Take Out (MTO) list.
9. Recommend system integration.
10. Recommend piping system design.
11. Approve activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship & Offshore Designing
Job Area	Engineering
Sub Area	Mechanical (Piping / Machinery)
Job Title	Piping / Machinery Design Specialist
Level	8

Job Definition :

An Piping/ Machinery Design Specialist is designated to recommend, provide & plan concept design, design calculation, piping/ machinery form design, technical specification recommendation, piping/ machinery installation monitoring and approve preliminary, detail & production as built drawing.

Job Description :

1. Provide consultation on Safety, Health & Environmental (SHE) compliance assessment design.
2. Provide consultation on concept design on piping/ machinery design.
3. Recommend technical specification.
4. Provide consultation on piping/ machinery form design.
5. Provide consultation on piping/ machinery installation.
6. Provide consultation on testing & commissioning procedures.

SECTOR : MARINE ENGINEERING INDUSTRY

SUB SECTOR : SHIP BOARD OPERATION

Sector	Marine Engineering Industry
Sub-sector	Ship Board Operation
Job Area	Deck Operation
Sub Area	N/A
Job Title	Able Body / Ordinary Seaman (Deck Rating)
Level	1

Job Definition :

An Able Body / Ordinary Seaman (Deck Rating) is designated to carry out lifesaving equipment launching, deck machinery operation, cargo gear operation, carry out scaling, buffing and painting decks, splicing wire & rope, rigging running gear & cargo securing and general maintenance.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Launch lifesaving equipment.
3. Operate deck machinery.
4. Operate cargo gear.
5. Perform general maintenance.
6. Perform lifeboat maintenance.
7. Carry out ships scaling and buffing.
8. Paints ship's deck & superstructure.
9. Carry out wire & rope splicing.
10. Carry out stow cargo, stationary rigging and running gear handling.
11. Carry out cargo securing.
12. Carry out boats launching & recovering.
13. Update activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Board Operation
Job Area	Deck Operation
Sub Area	N/A
Job Title	Leading Seaman (Deck Rating)
Level	2

Job Definition :

A Leading Seaman (Deck Rating) is designated to watch at sea and in port. supervise a small group of crew members carrying out deck department duties and perform other duties.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Operate steering wheel.
3. Update weather, telephone and radio watches and recording observations log-book.
4. Receiving and directing visitors on ship.
5. Control deck machinery operation such as winches, derricks and cranes.
6. Oversee loading and unloading of equipment and supplies.
7. Check and keeping records of soundings in fresh water and ballast tanks, bilges and wells.
8. Participate in towing, salvage, and rescue drill and operations.
9. Maintain lifeboats and safety equipment.
10. Oversee washing and cleaning of the ship's hull, decks and superstructure.
11. Coordinate minor maintenance and servicing of cabin fixtures and non-technical systems.
12. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Board Operation
Job Area	Deck Operation
Sub Area	N/A
Job Title	Bosun (Deck Rating)
Level	3

Job Definition :

A Bosun (Deck Rating) is designated to supervise the deck department crew on a ship, ensures cleanliness of the ship and good working condition of all machinery, equipment and ship's navigational aids under control of the deck department, directs the construction, maintenance and repair of aids to navigation and performs other duties.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Determine daily work schedules for ship crews.
3. Provide on-the-job training and instruction to crew members.
4. Reviewing work proficiency of deck crew.
5. Make recommendations for promotion or disciplinary action.
6. Oversee crew members engaged in ship's cleaning, such as chipping and scaling steel work, washing and painting wood-work, cleaning out holds and quarters.
7. Supervise running maintenance and repair to deck department machinery and equipment.
8. Conduct boat or barge engaged in landing.
9. inspect aids to navigation,
10. determine services or repairs needed on ship,
11. Assign deck personnel to the work and checking completed work.
12. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Board Operation
Job Area	Deck Operation
Sub Area	N/A
Job Title	Watchkeeping Officer
Level	4

Job Definition :

A Watchkeeping Officer is designated to tend to the safety and navigation of a vessel while at sea. There are usually several qualified watchkeepers on a ship, and the duties are divided into eight to twelve hour shifts, with the on-duty watchkeeper reporting directly to the captain when necessary.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Navigate ship and adept at plotting courses and positions.
3. determine position and course.
4. Watch for obstacles that might collide with the vessel.
5. Prepared to deal with adverse weather when it arises.
6. Watch the radar and the sky for any signs of adverse weather.
7. Adjust the course of the ship as required.
8. Maintain order among the crew members.
9. Ensure that all members are performing their respective duties.
10. Endorse activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Board Operation
Job Area	Deck Operation
Sub Area	N/A
Job Title	First Officer Chief Mate
Level	5

Job Definition :

A First Officer Chief Mate is designated to supervise the Second Mate, Third Mate, Bosun, Crane Operator and Dynamic Position Operator. The Chief Mate monitors all third party people as they work on the deck. In addition, the Chief Mate assists the Master to exercise control effectively over marine operations with appropriate regard for the protection of the environment, maintenance of equipment and personnel safety.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Check local and international laws related to vessel operation are being followed, and all pollution regulations are being met.
3. oversees maintenance of life saving, firefighting, deck and lifting equipment
4. Oversees exterior vessel maintenance.
5. Check equipment and materials are loaded, labeled and secured according to regulations.
6. Monitor that the vessel is maintained and operated according to the Marine Operations Manual guidelines.
7. Supervise loading and storing of all consumables.
8. Check the watertight integrity of the vessel is maintained.
9. Check the safety of the vessel crew and any cargo or equipment it may be carrying.

Sector Marine Engineering Industry

Sub-sector Ship Board Operation

Job Area Deck Operation

Sub Area N/A

Job Title Captain

Level 6

Job Definition :

A Captain is designated to operate ships. He is also responsible to direct crew, operate the ship and ensure safe port.

Job Description :

1. Command vessels in various bodies of water.
2. Operate and maintain engines, winches, navigational systems, fire extinguishers, and life preservers.
3. Measure and record water depths.
4. Ensure adequate levels of hydraulic fluid, air pressure, and oxygen.
5. Resolve problems with customers.
6. Sort logs or salvage lost logs.
7. Utilise electronic sounding devices.
8. Direct and coordinate crew members or workers performing activities such as loading and unloading cargo, steering vessels, operating engines, maintaining and repairing ship equipment.
9. Inspect ships operation ability condition.
10. Set courses and determine speeds using charts, plotting sheets, sextants, and compasses.
11. Monitor loading of cargo.
12. Record ship positions and movements.

Sector Marine Engineering Industry

Sub-sector Ship Board Operation

Job Area Engine Operation

Sub Area N/A

Job Title Wiper (Engine Rating)

Level 1

Job Definition :

A Wiper (Engine Rating) is designated to attend to the lubrication of machinery and equipment under the control of the Engine Room Department during the hours of a regular watch at sea and an auxiliary watch in port. Operate as directed all main and auxiliary machinery and equipment. Keep the Engine Room Department machinery, equipment and spaces in a clean and orderly condition. Work independently or under direction of an Engineer Officer during maintenance and opening up of main and auxiliary machinery for survey or repair and record data in Engine Room logs. Perform other duties as required.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Cleaning the engine room.
3. Check and maintain all oil pump levels of main and auxiliary machinery including thrust shaft and propeller shaft bearing.
4. Maintain correct levels by adding as necessary.
5. Check and maintain correct levels in manually filled oil feeder boxes grease cups of main and auxiliary machinery including pumps, steering gear, and refrigeration machinery.
6. Change and clean oil filters as necessary.
7. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Board Operation
Job Area	Engine Operation
Sub Area	N/A
Job Title	Greaser (Engine Rating)
Level	2

Job Definition :

A Greaser (Engine Rating) is designated to grease small piece parts, coat parts and dismantle unit to facilitate application of grease.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Greases small piece parts.
3. Coats parts with grease, using swabs and brushes, or dips parts into grease pot.
4. Dismantle units, such as breech or firing mechanism to facilitate application of grease.
5. Update activities checklist.

Sector	Marine Engineering Industry
Sub-sector	Ship Board Operation
Job Area	Engine Operation
Sub Area	N/A
Job Title	Oiler (Engine Rating)
Level	3

Job Definition :

An Oiler (Engine Rating) is designated to carry out engine maintenance, record temperature, and pressure and assist to stand by main engine and other auxiliary engines and other operating conditions.

Job Description :

1. Adhere to Safety, Health & Environmental (SHE) requirements.
2. Engage in work relating to engine maintenance.
3. Watch duty in port, sea and the other engine rating.
4. Engage in watch duty during navigation.
5. Record temperature, pressure and operating condition of machineries in engine space.
6. Assist to several maintenance works including housekeeping.
7. Assist to stand by main engine and other auxiliary engine.
8. Verify activities report.

Sector	Marine Engineering Industry
Sub-sector	Ship Board Operation
Job Area	Engine Operation
Sub Area	N/A
Job Title	Watchkeeping Engineer
Level	4

Job Definition :

A Watchkeeping Engineer is designated to be responsible for engine and other equipment start up and shut down, in charge of operation, repair and scheduled maintenance and involve in bunkering operation.

Job Description :

1. On fitter work either by day or regular watch keeping within and outside main engine and boiler spaces.
2. Responsible for engine and other equipment start-up and shutdown prior vessel departure and arrival at port.
3. In charge of operation, repair and scheduled maintenance of pumps, air compressors, oil purifiers, fresh water generators, boilers and auxiliary engines.
4. On regular watch of main engines and boilers simultaneously.
5. Involve in bunkering operation for fuel oil as well as fresh water for the ship operations and domestic consumption.
6. Prepare detail service or repair specification and spares requirement prior vessel docking.
7. Prepare equipment maintenance report on monthly basis and spare part stock take at regular basis.

Sector	Marine Engineering Industry
Sub-sector	Ship Board Operation
Job Area	Engine Operation
Sub Area	N/A
Job Title	Second Engineer
Level	5

Job Definition :

A Second Engineer is designated to provide the utmost assistance to the Chief engineer for running the ship efficiently. Moreover, the second engineer is also in-charge of all the operational engineers and the crew of the engine room. He ensures for their personnel safety and routine duties. He also plans the overall maintenance of all the machinery present in the engine room of the ship.

Job Description :

1. Responsible for risk assessment, briefing and safety training of the entire engine crew, especially for the junior engineers and fresh crew.
2. Operate & maintain lifesaving appliances and firefighting appliances.
3. Manage all the emergency machinery and equipment's.
4. In-Charge of pollution prevention equipment onboard.
5. Responsible for all oil transfer operations carried out onboard including bunkering.
6. Distributes and assigns task to engine crew members.
7. Keep and maintain record of the spares' inventory.
8. Responsible for the maintenance of all the engine room and deck machinery.
9. Responsible all the machineries and safety systems are working safely, efficiently and within the provided parameters.
10. Plan maintenance system (PMS).

Sector	Marine Engineering Industry
Sub-sector	Ship Board Operation
Job Area	Engine Operation
Sub Area	N/A
Job Title	Chief Engineer
Level	6

Job Definition :

A Chief Engineer is designated to oversee the entire Marine engineering department on the vessel and responsible for the maintenance and operation of all engineering equipment on board the vessel.

Job Description :

1. Responsible for the operation of the engine room and any maintenance of machinery onboard the vessel.
2. Liaise with the captain, occasionally holding equal rank, to ensure that the physical aspect of the vessel is completely under control.
3. Ensure that all maintenance is completed efficiently and in depth.
4. Maintain inventory for all spare parts, extra fuel and oil. This inventory must be kept up to date.
5. Ensure that the engine room is well kept and prepared for inspection by higher authorities.
6. Responsible in the event that the inspection by higher authority finds the room unsatisfactory.
7. Determine the volume of oil, fuel and lube required for each voyage and ensure that substantial quantities of each are on board.
8. Delivers general daily operation of the engine room to their primary assistant.