NEW ZEALAND MARITIME SCHOOL

NZ Diploma in Marine Electro-technology (NZ2894)

(STCW 1978 A-III/6, as amended in 2010)

Electro-Technical Officer, Year 2 Cadets, 2020.

Course Code
942.578 - AS01.

Course Title
Maintenance and Repair of Electrical and Electronic Equipment Yr2
Learning Outcomes Assessment.

Format
Written assignment of 1000 words including diagrams and marked Competent (C) or Not-Yet Competent (NYC). Weighting = 50%.

Due Date
To be submitted by email to nick.cossar@manukau.ac.nz for the due date of 05/04/2019.

Tutor
Nick Cossar
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Student Name:

Student ID:

Date:

This report assesses learning Outcomes 1, 2 and 3.

Student to complete an investigative research and report on each of the following topic areas. The report will address any explanation or descriptions required.

Outcome 1: Explain safety requirements for working on shipboard electrical equipment.

- State safety hazards which can be present when working on shipboard electrical equipment: electric shock, arc blast, transient overvoltage, movable (rotating) parts, environmental factors like high temperature, humidity, water, fuel, steam leaks, rain, wind, vessel rolling or pitching.
- Explain the selecting of proper Personal Protective Equipment (PPE) to be used when working on various shipboard electrical equipment: coveralls, safety or insulation shoes, safety glasses or full face shield, insulation gloves, insulation mates, hearing protection equipment, safety harness, hard hat, rubber apron, dust mask, flash suits.
- State the overvoltage installation categories (IEC 1010-1 Standard).
- Explain how to choose safe electric meter for different overvoltage categories.
- Explain Lockout-Tag Out procedures.
- Explain Job Safety Analysis process, performs JSA for given electrical task.
- Explain how Work Permit System works.
- Explain the use of fixed and portable earthing devices and how to apply them safely, describe safety precautions when performing various maintenance or repair tasks on vessel elevators, like releasing people trapped in elevator, checking operation of all safeties and control circuits.

(400 words and diagrams where necessary)

Outcome 2: Detect electrical malfunction, locate faults and describe measures to prevent damage

- Explain the methods for detection of electrical failures, and describes needed measuring instruments and methods of their use.
- Explain how to find faults using electrical wiring diagrams.
- On a given electrical circuit diagram, carries out logical procedure to detect the location of an earth fault, using insulation testing instruments.
- Explain why fault protection is essential.
- Describe how to take measurement before and after the running of the device in order to determine its condition.
- Describe practical ways to take measurement after damage and repair.
- Explain the principles of interpretation of measurement results.

(400 words and diagrams where necessary)

Outcome 3: Explain the construction and operation of electrical testing and measuring equipment.

- Explain construction and operation principle of analogue and digital instruments for basic electrical quantities measurements, as voltage, current, frequency, power, time and phase displacement.
- Explain basic rules for using and connection of instruments to the electrical circuit for measurement of voltage, current, frequency and power.
- Interpret the results from oscilloscope.
- Explain the construction and principle of operation of insulation testers, e.g. fixed inside switch boards or portable types.

(200 words and diagrams where necessary)

Final Note:

Where it is relevant include links to videos, OEM data sheets, manufacturer material that enhance the quality of these topic reports.

All material included in your report must have acknowledgment of original source with web URL

Resources

- CANVAS.
- Hall – Practical Marine Electrical Knowledge.
- Hughes – Electrical and Electronic Technology.
- Lloyds of London Rules and Regulations for the Classification of Ships July 2018.