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## **TRAINING IN THE MAINTENANCE OF ELECTRONIC NAVIGATIONAL EQUIPMENT**

**Notice to all Shipowners, Ship Operators, Masters, Officers in the Merchant Navy and Marine Electronics and Radio Colleges.**

*This notice replaces MSN 1623 and MSN 1623 Amendment No. 1.*

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### **PLEASE NOTE:-**

Where this document provides guidance on the law it should not be regarded as definitive. The way the law applies to any particular case can vary according to circumstances - for example, from vessel to vessel and you should consider seeking independent legal advice if you are unsure of your own legal position.

### **Summary**

- Colleges provide training courses to deliver the knowledge and skill necessary to maintain the electronic navigational and communication equipment commonly found on merchant ships. Training on fault finding techniques is included.
- Maritime Administrations must ensure that personnel undertaking the GMDSS Radio Maintenance Certificate, and companies using personnel with these qualifications, do so in accordance with SOLAS Chapter IV, Regulation 15, 6&7.
- At the end of the training, candidates can be assessed for two AMERC accredited qualifications
- GMDSS Radio Maintenance Certificate (MCA approved)
- Electronic Navigation Electrical Maintenance Certificate (ENEM)(MCA recognised)

## **1. Introduction/ Background**

1.1 A programme of training is offered by colleges which lead to certification accredited by the Association of Marine Electronic and Radio Colleges (AMERC). The aim of this training course is to provide the knowledge and skill necessary to maintain the electronic navigational and communications equipment commonly found on merchant ships. Candidates will develop the skill to fault-find to component, printed circuit board and module level, depending on the constraints imposed by the design of the equipment and the resources normally available on board ship.

1.2 The training enables the maintainer to appreciate the range of operational uses of electronic navigational data, the limitations of this data and the probable magnitude of error. Information derived from the use of such information is assessed and used as a primary basis for the evaluation of faults occurring in these systems.

1.3 Training on fault finding techniques includes the application of systems level knowledge, the use of test equipment including any built-in test equipment, an understanding of the advantages and disadvantages of modular replacement techniques, and the location of faults to component level. At least 50 percent of course time consists of practical exercises on approved equipment.

## **2. GMDSS RADIO MAINTENANCE CERTIFICATE:**

2.1 The training provides candidates with the required basic knowledge in electronics and radio engineering to enable them to maintain ships radio communications equipment. Assessment for the above Certificate is by both practical and written examination. The written Principles paper is also a prerequisite for candidates wishing to study for an ENEM Certificate. The GMDSS Radio Maintenance Certificate is accredited by AMERC.

2.2 The syllabus for Principles examination includes:

- Safety
- Circuit Theory
- Capacitors
- Magnetism
- Transformers
- Secondary Cells
- Decibels
- Semiconductor Applications
- D.C. Transients
- DC Restoration
- Limiting and Squaring
- A.C. Theory
- Power Supplies
- Amplifiers
- Oscillators
- Logic
- Digital Circuits
- Measuring Instruments

2.3 The syllabus for the GMDSS Radio Maintenance Certificate includes:

- Transmitters
- Receivers
- Aerials
- Feeders
- Radio Propagation
- Performance checking and fault finding on GMDSS radio equipment.

## **3. ELECTRONIC NAVIGATION EQUIPMENT MAINTENANCE CERTIFICATE:**

3.1 The training provides candidates with the necessary knowledge and skill to maintain ships electronic navigational equipment. The assessment consists of maintaining a logbook of practical tasks and written papers on the knowledge of electronics and electronic navigation theory. Candidates will have satisfied the conditions for entry on to the course by completing the Radio Maintenance Certificate Principles Paper. The Certificate is accredited by AMERC.

3.2 The syllabus for the Electronic Navigation Equipment Maintenance Certificate includes:

- Principles of Radar
- ARPA
- Position fixing equipment
- Speed logs
- Echo sounders
- Automatic Steering systems
- Compasses
- Practical operational checks
- Fault finding on a range of such equipments.

#### 4. LINKS TO OTHER QUALIFICATIONS:

4.1 Candidates studying Higher National Diploma (HND) or Foundation Degree qualifications which include specific modules on Radio Communication Engineering, Electronic Navigation Systems and Navigation Systems Fault Diagnosis may claim exemptions from elements of both examinations.

4.2 The Merchant Navy Training Board (MNTB) approved workshop skills tasks for the electro technical officer scheme (to be introduced in 2009) are closely linked to this training and will provide exemption from elements of the examinations

#### 5. CERTIFICATION:

5.1 The Maritime and Coastguard Agency recognises these training programmes and would like to bring them to the attention of personnel on merchant ships.

5.2 Further details regarding these courses and certificates can be obtained directly from AMERC at the address given in the annex to this Notice.

#### More Information

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MCA Website Address: [www.mcga.gov.uk](http://www.mcga.gov.uk)

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Further details of courses and certificates can be found at:

[www.amerc.ac.uk](http://www.amerc.ac.uk)

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