

GMDSS Radio Maintenance and Survey Readiness Course

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GMDSS Radio Maintenance and Survey Readiness Course

Introduction:

GMDSS radio maintenance and survey readiness is the work of keeping a ship's Global Maritime Distress and Safety System equipment working to the maintenance rules of SOLAS Chapter IV and ready for its annual radio survey. This 2-week course is for marine electronics technicians, electro-technical staff, ship radio maintainers and technical superintendents, and its final deliverable is a ship-specific GMDSS maintenance and radio survey readiness plan. It is taught at intermediate to advanced practitioner level as a lab, with delegates fault-finding equipment on a test bench against IMO Resolution A.70217, the radio maintenance guidelines for GMDSS.

Course Objectives:

- Define the GMDSS functional requirements and sea areas, and distinguish Inmarsat-C from Iridium terminals as recognised mobile satellite services
- Distinguish duplication, shore-based maintenance and at-sea electronic maintenance, and select the combination SOLAS Chapter IV Regulation 15 requires for a ship's sea areas
- Apply structured fault-finding with dummy loads, power meters, battery testers and cable analysers to restore DSC, satellite and NAVTEX equipment to service
- Compare float-free and manual EPIRBs, and radar SARTs and AIS-SARTs, and apply the annual testing and shore-based maintenance requirements to each
- Interpret the radio log, the Record of Equipment and the survey checklist to judge whether a ship is ready for its annual radio survey
- Justify maintenance intervals, spares holdings and equipment replacement decisions using fault history, readiness indicators and clear reports to crews and surveyors

Target Audience:

- Marine electronics and radio technicians who service shipboard radio installations, deciding whether a unit can be repaired on site or must be replaced
- Electro-technical staff on board who carry out at-sea electronic maintenance, judging when a fault exceeds onboard capability and needs shore support
- Ship radio maintainers and service-agent staff who perform shore-based maintenance and beacon servicing, deciding whether test results support a return-to-service entry
- Port and shore-based maintenance staff who prepare vessels for radio surveys, judging which defects must be closed before the surveyor attends
- Fleet technical staff who follow radio equipment condition across several ships, choosing the maintenance method, service intervals and spares holding for each vessel

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Course Outline:

Day 1: Foundations: GMDSS Functions, Sea Areas and Shipboard Radio Installations

- GMDSS Functional Requirements: Alerting, Locating, Distress Traffic and Maritime Safety Information Duties
- Sea Area A1/A2 vs A3/A4: Radio Equipment Carriage Set by Trading Area
- Shipboard GMDSS Console Layout: Transceivers, Satellite Terminals, Receivers and Survival Craft Units
- Modernised GMDSS Amendments: Recognised Mobile Satellite Services and Withdrawn Legacy Equipment Duties
- MMSI and Maritime Identities: Programming Rules Under the ITU Radio Regulations

Day 2: Maintenance Rules: SOLAS Chapter IV Regulation 15 and IMO Radio Maintenance Guidelines

- Duplication vs Shore-Based Maintenance vs At-Sea Electronic Maintenance: Availability Methods Under SOLAS Chapter IV
- Sea Area Combinations: Choosing Two of Three Maintenance Methods for A3 and A4 Ships
- IMO Resolution A.70217: Radio Maintenance Guidelines for GMDSS Installations and Onboard Spares
- Shore-Based Maintenance Agreements: Scope, Service Agent Duties and Evidence Kept on Board
- At-Sea Electronic Maintenance Capability: Qualified Personnel, Spare Parts and Technical Documentation

Day 3: Core Skills: Testing and Servicing MF/HF and VHF DSC Radio Equipment

- MF/HF DSC vs VHF DSC Transceivers: Frequency Bands, Alert Formats and Range
- DSC Test Calls: Verifying Transmit and Receive Paths Without False Distress Alerts
- Dummy Load and Power Meter Checks: Measuring Transmitter Output and Reflected Power
- Antenna Tuning Units and Coupler Faults: Diagnosing High SWR on HF Installations
- Portable Two-Way VHF Radiotelephones: Battery Seals, Expiry Checks and Channel Tests

Day 4: Tools and Systems: Satellite Terminals, NAVTEX and Power Supply Test Equipment

- Inmarsat-C vs Iridium GMDSS Terminals: Recognised Mobile Satellite Service Differences for Maintainers
- Satellite Terminal Link Tests: Logon Status, Distress Button Circuit and GNSS Position Input
- NAVTEX Receiver Servicing: Station Selection, Message Type Settings and Antenna Checks
- Reserve Source of Energy: Battery Capacity Tests, Hydrometer Readings and Charger Alarms
- Insulation Testers and Cable Analysers: Locating Coaxial Damage, Water Ingress and Earth Faults

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Day 5: Week-One Integration: Guided Lab Case on a Complete GMDSS Console Fault

- Fault Tree vs Half-Split Method: Structuring the Search for an Intermittent Radio Fault
- Guided Test-Bench Case: Tracing a Failed DSC Alert From Controller to Antenna
- Power Changeover Exercise: Proving Main to Reserve Supply Switching Under Load
- Interface Fault Case: GNSS Position Feed Lost Across DSC and Satellite Units
- Week-One Fault Log Review: Recording Symptoms, Tests, Repairs and Return-to-Service Checks

Day 6: Advanced Topics: EPIRBs, SARTs and Survival Craft Radio Equipment

- Float-Free EPIRB vs Manual EPIRB: Release Units, Hydrostatic Expiry and Mounting Checks
- EPIRB Annual Testing Under MSC/Circ.1039: Self-Test, Beacon Coding and Registration Checks
- EPIRB Shore-Based Maintenance Under MSC.1/Circ.1040 Rev.1: Battery Replacement and Interval Rules
- Radar SART vs AIS-SART: Test Modes, Detection Checks and Battery Expiry
- Beacon and SART Test Sets: Confirming Transmission Without Triggering a Live Distress Alert

Day 7: Compliance and Quality: Radio Survey Requirements, Records and Defect Control

- Annual Radio Survey vs Shore-Based Maintenance Visit: Purpose, Scope and Evidence Required
- Record of Equipment Form R: Matching Installed Radio Units to the Safety Certificate
- GMDSS Radio Log: Daily, Weekly and Monthly Test Entries Surveyors Check
- Radio Survey Checklist Items: Antennas, Labels, Operating Instructions and Spare Fuses
- Deficiency Handling: Classing Radio Defects, Temporary Measures and Close-Out Evidence

Day 8: Stakeholders and Communication: Working With Crews, Surveyors and Service Agents

- Ship Crew vs Shore Technician Roles: Who Tests, Who Repairs, Who Signs
- Service Reports for Surveyors: Writing Test Results, Readings and Repair Findings Clearly
- Briefing GMDSS Operators: Handover of Repaired Equipment and Correct Self-Test Use
- False Distress Alert Response: Cancellation Procedure and Reporting After a Maintenance Error
- Equipment Replacement Decisions: Change Requests, Type Approval Evidence and Owner Sign-Off

Day 9: Measurement and Improvement: Reliability Data, Maintenance Intervals and Readiness Indicators

- Preventive vs Corrective Maintenance: Setting Radio Service Intervals From Fault History
- Mean Time Between Failures: Estimating Reliability of Transceivers, Terminals and Batteries
- Survey Readiness Indicators: First-Time Pass Rate, Open Defects and Overdue Tests
- Spare Parts and Consumables Planning: Batteries, Release Units and Critical Modules
- Fleet Benchmarking of Radio Faults: Comparing Vessels, Equipment Makers and Repeat Defects

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Day 10: Lab Capstone: Building a GMDSS Maintenance and Radio Survey Readiness Plan

- Sea Area vs Installed Equipment Check: Mapping a Delegate's Ship Against Carriage Rules
- Maintenance Method Selection Exercise: Justifying Duplication, Shore-Based or At-Sea Arrangements
- Test-Bench Fault-Finding Assessment: Clearing a Seeded Fault on a DSC or Satellite Unit
- Mock Radio Survey Walkthrough: Checking Logs, Beacons, Batteries and Records Against the Checklist
- GMDSS Maintenance and Survey Readiness Plan: Completing and Presenting the Ship-Specific Plan

Skills You Will Gain:

- DSC Transceiver Testing
- Satellite Terminal Verification
- EPIRB and SART Servicing
- Reserve Battery Capacity Testing
- RF Fault Isolation
- Radio Survey Preparation
- GMDSS Maintenance Planning
- Radio Log Auditing

Why Attend This Course:

- From replacing radio units by trial and error to isolating faults with dummy loads, power meters and cable analysers
- From treating the annual radio survey as a surprise to arriving with logs, records and beacon tests already in order
- From running GMDSS maintenance by habit to matching duplication, shore-based and at-sea arrangements to the ship's sea areas
- From scattered service notes to a ship-specific GMDSS maintenance and radio survey readiness plan

Conclusion:

GMDSS radio maintenance and survey readiness means keeping every distress and safety radio on a ship provably working, so that its alerting, locating and safety-information functions can be proven when a surveyor asks. The course makes three distinctions clear: duplication versus shore-based versus at-sea maintenance, Inmarsat-C versus Iridium terminals, and an annual radio survey versus a shore-based maintenance visit. It suits technicians, electro-technical staff and fleet technical staff at intermediate to advanced level who already work on shipboard radio equipment and now need to diagnose faults faster and prepare ships for survey.

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A graphic illustration of a chessboard with several chess pieces. A gold king piece is prominent in the foreground, with a silver pawn and a gold pawn nearby. The board is checkered, and there are concentric circles in the background.

Frequently Asked Questions FAQ:

What should a delegate know before a GMDSS radio maintenance and survey readiness course?

Working experience with marine electronics or radio equipment and the use of a multimeter is expected. Delegates should recognise the main GMDSS units on a bridge; regulations, test methods and survey records are built up step by step before the bench exercises.

How does a GMDSS radio maintenance and survey readiness course differ from a GMDSS operator course?

It teaches servicing, testing and fault-finding of the equipment rather than operating it to send and receive distress traffic. Operator courses prepare watchkeepers to use the consoles; this course prepares technical staff to keep them working and to evidence that for a radio survey.

Why does GMDSS radio maintenance need more than one maintenance method on some ships?

SOLAS Chapter IV Regulation 15 requires equipment availability to be ensured by duplication, shore-based maintenance or at-sea electronic maintenance, or a combination. Ships trading in sea areas A3 and A4 use at least two of the three methods, so one failure does not remove distress capability.

What does a delegate take back to work from a GMDSS radio maintenance and survey readiness course?

A ship-specific GMDSS maintenance and radio survey readiness plan covering the chosen maintenance methods, test schedules, EPIRB and SART servicing intervals, spares and a pre-survey checklist, plus a fault-finding routine the delegate has already applied on the test bench.

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