<table>
<thead>
<tr>
<th>Name of Vessel</th>
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<th>Official Number</th>
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<th>Date Completed</th>
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<table>
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<th>Location</th>
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</table>

<table>
<thead>
<tr>
<th>Vessel Built in Compliance with SOLAS:</th>
<th>60</th>
<th>74</th>
<th>74/78</th>
<th>NA</th>
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<table>
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<tr>
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<tbody>
<tr>
<td>☐ Inspection for Certification (COI)</td>
<td></td>
</tr>
<tr>
<td>☐ Annual</td>
<td></td>
</tr>
<tr>
<td>☐ Periodic</td>
<td></td>
</tr>
<tr>
<td>☐ Other _____________________________</td>
<td></td>
</tr>
<tr>
<td>☐ Reinspection</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>☐ Second</td>
<td></td>
</tr>
<tr>
<td>☐ Third</td>
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</table>

<table>
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<tr>
<th>Inspectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
</tbody>
</table>
## Total Time Spent Per Activity:

### Regular Personnel (Active Duty)

<table>
<thead>
<tr>
<th>ACTIVITY TYPE</th>
<th>ACTIVITY</th>
<th>TRAINING</th>
<th>(PERS) MI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL ADMIN HOURS</th>
<th>TOTAL TRAVEL HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

### Reserve Personnel

<table>
<thead>
<tr>
<th>ACTIVITY TYPE</th>
<th>ACTIVITY</th>
<th>TRAINING</th>
<th>(PERS) MI</th>
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<tbody>
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<th>TOTAL TRAVEL HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

### Auxiliary Resources

<table>
<thead>
<tr>
<th>TOTAL BOAT HOURS</th>
<th>TOTAL AIRCRAFT HOURS</th>
</tr>
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<tr>
<td></td>
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</tbody>
</table>

## Conversions:

### Distance and Energy

<table>
<thead>
<tr>
<th>Kilowatts (kW)</th>
<th>X</th>
<th>1.341</th>
<th>Horsepower (hp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet (ft)</td>
<td>X</td>
<td>3.281</td>
<td>Meters (m)</td>
</tr>
<tr>
<td>Long Ton (LT)</td>
<td>X</td>
<td>.98421</td>
<td>Metric Ton (t)</td>
</tr>
</tbody>
</table>

### Liquid (NOTE: Values are approximate.)

<table>
<thead>
<tr>
<th>Liquid</th>
<th>bbl/LT</th>
<th>m³/t</th>
<th>bbl/m³</th>
<th>bbl/t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshwater</td>
<td>6.40</td>
<td>1.00</td>
<td>6.29</td>
<td>6.29</td>
</tr>
<tr>
<td>Saltwater</td>
<td>6.24</td>
<td>.975</td>
<td>6.13</td>
<td>5.98</td>
</tr>
<tr>
<td>Heavy Oil</td>
<td>6.77</td>
<td>1.06</td>
<td>6.66</td>
<td>7.06</td>
</tr>
<tr>
<td>DFM</td>
<td>6.60</td>
<td>1.19</td>
<td>7.48</td>
<td>8.91</td>
</tr>
<tr>
<td>Lube Oil</td>
<td>7.66</td>
<td>1.20</td>
<td>7.54</td>
<td>9.05</td>
</tr>
</tbody>
</table>

### Weight

<table>
<thead>
<tr>
<th>1 Long Ton</th>
<th>2240 lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Short Ton</td>
<td>2000 lbs</td>
</tr>
<tr>
<td>1 Cubic Foot</td>
<td>.748 gal</td>
</tr>
<tr>
<td>1 Barrel (oil)</td>
<td>6.29 m³</td>
</tr>
<tr>
<td>1 psi</td>
<td>.06895 Bar = 2.3106 ft of water</td>
</tr>
</tbody>
</table>

### Temperature: Fahrenheit = Celsius (°F = 9/5 °C + 32 and °C = 5/9 (°F – 32))

| 0     | -17.8 |
| 32    | 0     |
| 40    | 4.4   |
| 50    | 10.0  |
| 60    | 15.6  |
| 70    | 21.1  |

| 80    | 26.7  |
| 90    | 32.2  |
| 100   | 37.8  |
| 110   | 43.3  |
| 120   | 48.9  |
| 150   | 65.6  |
| 200   | 93.3  |
| 250   | 121.1 |
| 300   | 148.9 |
| 400   | 204.4 |
| 500   | 260   |
| 1000  | 537.8 |

### Pressure: Bars = Pounds per square inch

<table>
<thead>
<tr>
<th>1 Bar</th>
<th>14.5 psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 bars</td>
<td>29.0 psi</td>
</tr>
<tr>
<td>3 Bars</td>
<td>43.5 psi</td>
</tr>
<tr>
<td>4 Bars</td>
<td>58.0 psi</td>
</tr>
<tr>
<td>5 Bars</td>
<td>72.5 psi</td>
</tr>
<tr>
<td>6 Bars</td>
<td>87.0 psi</td>
</tr>
<tr>
<td>7 Bars</td>
<td>101.5 psi</td>
</tr>
<tr>
<td>9 Bars</td>
<td>130.5 psi</td>
</tr>
<tr>
<td>10 Bars</td>
<td>145.0 psi</td>
</tr>
</tbody>
</table>

### Conversion Factors

- Kilowatts to Horsepower: $1 \text{ kW} \times 1.341 = \text{ hp}$
- Feet to Meters: $1 \text{ ft} \times 0.3048 = \text{ m}$
- Long Ton to Metric Ton: $1 \text{ LT} \times 0.98421 = \text{ t}$
- Liquid Measurements: $1 \text{ bbl} = 42 \text{ gal} = 6.29 \text{ m}^3$
- Temperature Conversion: Fahrenheit to Celsius: 
  $\frac{9}{5} \times (\text{°F} - 32) = \text{°C}$
  $\frac{5}{9} \times \text{°C} + 32 = \text{°F}$
- Pressure Conversion: Bars to Pounds per square inch: 
  $1 \text{ Bar} = 14.5 \text{ psi}$
  $2 \text{ bars} = 29.0 \text{ psi}$
  $3 \text{ Bars} = 43.5 \text{ psi}$
  $4 \text{ Bars} = 58.0 \text{ psi}$
Use of Machinery Inspection Book:

This inspection book is intended to be used as a job aid by Coast Guard marine inspectors during machinery inspections of U.S. flagged vessels. The lists contained within this book are not intended to limit the inspection. Each marine inspector should determine the depth of inspection necessary. A checked box should be a running record of what has been inspected. It does not imply that the entire system has been inspected or that all or any items are in full compliance. This job aid does not constitute part of the official inspection record.

This document does not establish or change Federal laws or regulations. References given are only general guides. Refer to IMO publications, CFRs, NVICs, or any locally produced cite guides for specific regulatory references. Not all items in this book are applicable to all vessels or types of propulsion systems.

NOTE: Guidance on how to conduct machinery inspections of U.S. flagged vessels can be found in Marine Safety Manual (MSM) Volume II: Inspection of Vessels for Certification. All MSM cites listed in this book refer to MSM Volume II unless otherwise indicated.

Pre-inspection Items:
- Review MISLE records.
- Obtain copies of Certificates to be issued.

Post-inspection Items:
- Issue/endorse certificates as appropriate.
- Complete MISLE entries.
  - Activity Type
  - Team Members
  - Vessel Details
  - Fleet of Resp
  - Deficiencies
  - Certificates
- Initiate Notice of Violation (NOV) if necessary.
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- Auxiliary Machinery ........................................... 7
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- Watertight Integrity ............................................. 12
- Pollution Prevention .......................................... 13
- Marine Sanitation Devices ................................. 13
- Miscellaneous .................................................. 14

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- Deficiency Summary Worksheet ......................... 16
- Notes ................................................................. 18
- Conversions ....................................................... 19

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**Deficiency** | **Req't. Issued/ Date Completed**
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Notes:

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**Section 1: Inspection Items**

### Boilers:

- **Propulsion machinery**
  - Safety devices
  - Foundations
  - Guards
  - Controls

- **Propulsion and auxiliary boilers**
  - Shells or drums
  - Headers
  - Superheater
  - Blow off piping and valves
  - Tubes or flues
  - Furnaces
  - Soot blowers
  - Economizers
  - Combustion chambers
  - Refractory
  - Casing and insulation
  - Uptakes
  - Air preheaters
  - Forced draft blowers
  - Foundations
  - Gauges
  - Water level indicators

- **Periodic test and inspection of boilers in accordance with 46 CFR Table 61.05-10**

<table>
<thead>
<tr>
<th>Boiler ID Number</th>
<th>Date Hydrostatically Tested</th>
<th>Date Mountings Opened</th>
<th>Date Mountings Removed and Studs Examined</th>
<th>Fireside</th>
<th>Waterside</th>
<th>External</th>
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</thead>
<tbody>
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**Notes:** ______________________________________
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**Deficiency Summary Worksheet:**

<table>
<thead>
<tr>
<th>Name of Vessel</th>
<th>VIN</th>
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<table>
<thead>
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<th>Deficiency</th>
<th>Req’t. Issued/ Date Completed</th>
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<tbody>
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</tbody>
</table>

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16
Testing of Boiler Safety Valve

46 CFR 52.01-120

Recommended US Vessel Deficiency Procedures:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Identify deficiency.</td>
</tr>
<tr>
<td>2</td>
<td>Inform vessel representative.</td>
</tr>
<tr>
<td>3</td>
<td>Record on the Deficiency Summary Worksheet (next page).</td>
</tr>
<tr>
<td>4</td>
<td>If deficiency is corrected prior to end of inspection, go to Step 7.</td>
</tr>
<tr>
<td>5</td>
<td>If deficiency is unable to be corrected prior to end of inspection, issue CG-835 in accordance with table below.</td>
</tr>
</tbody>
</table>

**IF deficiency:**

<table>
<thead>
<tr>
<th>THEN issue CG-835:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does NOT immediately impact crew/passenger safety, hull seaworthiness, or the environment, e.g.,</td>
</tr>
<tr>
<td>• Missing placards</td>
</tr>
<tr>
<td>Allows vessel operations to be MODIFIED to meet less stringent requirements, e.g.,</td>
</tr>
<tr>
<td>• Automation defect</td>
</tr>
<tr>
<td>DOES immediately impact crew/passenger safety, hull seaworthiness, or the environment, and cannot be modified to meet less stringent requirements, e.g.,</td>
</tr>
<tr>
<td>• Missing or defective firefighting equipment</td>
</tr>
</tbody>
</table>

6 Enter CG-835 data in MISLE.

7 Initiate Report of Violation (ROV) if necessary.

---

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
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<tbody>
<tr>
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<tr>
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</table>

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<tr>
<td>• Automation defect</td>
</tr>
<tr>
<td>DOES immediately impact crew/passenger safety, hull seaworthiness, or the environment, and cannot be modified to meet less stringent requirements, e.g.,</td>
</tr>
<tr>
<td>• Missing or defective firefighting equipment</td>
</tr>
</tbody>
</table>

6 Enter CG-835 data in MISLE.

7 Initiate Report of Violation (ROV) if necessary.
### Safety valves
- Relieving gear
- Escape pipes
- Drains

<table>
<thead>
<tr>
<th>Boiler</th>
<th>Date Set and Sealed</th>
<th>Pressure Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

### Superheater safety valves

<table>
<thead>
<tr>
<th>Boiler</th>
<th>Date Set and Sealed</th>
<th>Pressure Setting</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

### Installation
- Operation
- Ventilation
- Wiring and piping
- Maintenance
- Placard posted
- Safety
- Accessibility to parts requiring routine servicing
- Manufacturer’s instructions available

### Miscellaneous:

- Liquefied petroleum gases for cooking and heating
  - Approved type
  - Cylinder
    - Test dates
    - Stowage
  - Safety relief device
  - Regulators
  - Piping and fittings
  - Location

- Tank tops, bilges, cofferdams, and bilge wells

- Sea suction and overboard discharges

- Nonmetallic expansion joints
  - External exam
  - 10-year service replacement

- Means of escape
  - Accessibility
  - Absence of locks

- ISM
  - Machinery space maintenance
  - Non-conformity record keeping
  - Documents and reports

### Notes:

__________________________________________________________________________
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Notes: ___________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
Pollution Prevention:

NOTE: Guidance for inspecting pollution prevention items is detailed in MSM Volume II, Chapter 31.

- Oil record book maintained and submitted
  - 33 CFR 151.25
  - MARPOL Ax. I/20

- Oily water separating equipment
  - Approved equipment
  - Operationally tested
  - Alarms
  - Shutdowns
  - 33 CFR 155.380
  - MARPOL Ax. I/6
  - MSM Vol. IV
  - MSM Vol. II

- Ballast discharge
  - Piping system
  - Outlet
  - Stop valve
  - Acceptable processing equipment
  - 33 CFR 155.330
  - 33 CFR 155.350
  - 33 CFR 155.360
  - 33 CFR 155.370
  - MSM Vol. II

- Pollution placard posted
  - 33 CFR 155.450
  - MSM Vol. II

- Oily waste retention
  - Bilge
  - Tank
  - MSM Vol. II

- Emission Controls
  - MARPOL VI
  - CG-543 Policy Ltr 09-01
  - 40 CFR 94 or 1042
  - 46 CFR 63.25-9

  - NOx Requirements
  - EPA engine emission stds for vsls on int'l voyages;
  - EIAPP Cert. issued by the EPA for vsls on int'l voyages
  - IAPP Cert.
  - Fuel and SOx Requirements
  - Incinerator
  - Ozone Depleting Substance

Marine Sanitation Devices:

NOTE: Guidance for inspecting marine sanitation devices is detailed in MSM Volume II, Chapter 18.K.

- Marine sanitation device
  - Type I
  - Type II
  - Type III
  - Certified for inspected vessels
  - Capacity satisfactory

Notes:

- Marine sanitation devices
  - Type I
  - Type II
  - Type III
  - Certified for inspected vessels
  - Capacity satisfactory

- MSM Vol. II

- MSM Vol. II

- MSM Vol. II
Fixed fire extinguishing system (machinery spaces) (System servicing is recorded in Hull Inspection 840 Book.)
- Piping/flexible loops
- Heads
- Alarms
- Markings

Fire main systems and stations (machinery spaces)
- Required number and type, proper threads
- Nozzles (combination, etc.)
- Applicators
- Spanners
- Markings

Pumps tested
- Controls and gauges
- Relief valves
- Markings

Paint locker

Automatic auxiliary boilers
- Controls and safety devices
- Fuel systems
- Alarms
- Inspections/test

Boiler repairs in accordance with 46 CFR Part 59

Low pressure heating boilers
- Safety or relief valves
- Gauges
- Thermometers
- Automatic controls
- Bottom blow off
- Water level indicator
- Connections
- Refractory

Periodic test and inspection of low pressure heating boilers in accordance with 46 CFR Table 61.05-10

Watertight Integrity:

Watertight integrity of machinery spaces
- Watertight doors
- Alarms
- Controls
- Bulkheads (penetrations)
- Markings

Paint locker

Notes: ___________________________________________________
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Table: Boiler Number Date Hydrostatically Tested Fireside Waterside External

Notes: ___________________________________________________
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12
Diesels:

- **Propulsion machinery**
  - Safety devices
  - Foundations
  - Guards
  - Controls
- **Main propulsion diesels**
  - Fuel lines
  - Air starting lines
  - Exhaust system
    - Manifold
    - Exhaust pipe
  - Protective devices
  - Lube oil system
    - Coolers
    - Standby L/O pump
  - Engine protection
    - Remote shutdowns
    - Overspeed protection
    - Low lube oil
    - High temperature
    - Crank case
  - Explosion covers
- **Gas Turbine Installations**
  - Design, construction, and materials
  - Exhaust system
  - Cooling and ventilation
  - Automatic shutdowns
  - Fuel systems
  - Fire extinguishing systems
- **Automation**
  - Reduced manning
    - Yes
    - No
  - Approved test procedure
  - Satisfactory test
  - Reviewed logs/records
  - Interviewed personnel
  - Verify programmable systems/devices

General electrical installation
- Jury rigs
- Connection boxes
- Dead-end cables
- Splices
- Grounding
- Personnel safeguards (guards, rails, etc.)
- Hazardous locations
- Portable electrical equipment

Firefighting Equipment:

- **Portable extinguishers (machinery spaces)**
  - Required number, type, and class
  - Annually serviced
  - Bottles hydrostatically tested (every 5 years)
  - Markings (weight and hydrostatic test date)
  - Spare charges, spare extinguishers

- **Semiportable extinguishers (machinery spaces)**
  - Required number, type, and class
  - Annually serviced
  - Bottles hydrostatically tested (every 12 years)
  - Controls, instructions, markings
  - Hose and diffuser
  - Flexible loops tested or replaced (same as bottle)

- **Sprinkler system tested**
  - Type
  - Pumps
  - Manifold
  - Controls
  - System diagram posted

Notes: ___________________________________________________
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_________________________________________________________________________
Pressure Vessels:

- Emergency generator tested
  - Starting system
  - Fuel system
  - Overspeed trip (> 110% < 115%)
  - Low oil pressure alarm / shutdown
  - High jacket water temperature alarm
  - Fixed firefighting system shutdown

- Emergency batteries tested
  - Protection
  - Charger
  - Ventilation

- Adequate emergency power and lighting
  - 46 CFR 112.43

- Internal communications and control system
  - General alarms
  - Engine order telegraph
    - Failure alarms
  - Telephones
  - Voice tubes
  - Public address system
  - Pilothouse controls
  - Fire detection and alarm systems
  - Steering gear alarm and indicator

- Lifeboat electrical installation
  - Winches and controls tested
  - Master switch opened
  - Limit switches opened
  - Emergency disconnect switch opened

- Emergency Loads
  - Temporary loads
  - Final loads

Pressure vessels hydrostatically tested or internally examined

<table>
<thead>
<tr>
<th>Service</th>
<th>MAWP</th>
<th>Date Tested or Examined Internally</th>
<th>Relief Valve Tested</th>
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Relief valves springs set within range

- Auxiliary Machinery:
  - Bilge and ballast systems
    - Pumps
    - Eductors
    - Emergency bilge pump
    - Manifold, valves, and piping
    - Remote controls (hydraulic, pneumatic, manual, electric)
    - Strainers
    - Sounding and vent piping
    - Markings and indicators

- Compressed air system
  - Compressor
  - Controls and gauges
  - Relief valves

Notes: ____________________________________________________

Notes: ____________________________________________________

Notes: ____________________________________________________

Notes: ____________________________________________________

Notes: ____________________________________________________
- Lubrication systems 46 CFR 56.50-80
  - Pumps
  - Heat exchangers
  - Valves and controls
  - Piping
  - Gauges, thermometers, and alarms
  - Tanks, vents, and strainers

- Refrigeration and air conditioning systems 46 CFR 58.20
  - Compressors
  - Valves and controls
  - Spare refrigerant stowage
  - Gas mask (ammonia) with spare charges
  - Ventilation
  - Alarms

- Evaporators 46 CFR 54.01-10
  - Pumps
  - Valves and controls

- Freshwater systems (potable and domestic)
  - Pumps
  - Valves and controls
  - Sump tanks
  - Tank pressure
  - Air cushion supply line

- Steering gear systems tested 46 CFR 58.25
  - Motors and pumps 46 CFR 61.20
  - Telemotor or other control 46 CFR 58.25-70
  - Indicators and alarms 46 CFR 58.25-25
  - Instructions and markings 33 CFR 164.34
  - Final emergency power source 46 CFR 58.25-65

**Electrical Systems:**

**NOTE:** Guidance for inspecting electrical systems is detailed in NVIC 2-89.

- Ship’s service generators 46 CFR 110.10
  - Protective guards 46 CFR 111.12
  - Reverse power relay SOLAS 74/78 II-1/41
  - Overspeed trip (> 110% < 115%) MSM Vol. II
  - Low oil pressure alarm / shutdown 46 CFR 111.12-1

**Switchboards (including emergency)**

- Automatic bus transfer
- Ground detectors
- Personnel safeguards (guards, rails, mats, etc.)
- Drip shields
- Nameplates
- Warning notices posted
- Fuse/circuit breaker ratings

**Panel boards** 46 CFR 111.30

- Overcurrent devices
- Circuit directory
- Locking device

**Motor controllers** 46 CFR 111.70

- Drip shields
- Disconnect switch
- Wiring diagram posted
- Remote shutdowns tested

**Ventilation systems** 46 CFR 111.103

- Remote shutdown tested
- Cargo fans
- Machinery space fans
- Accommodation fans

**Ship’s service lighting systems** 46 CFR 111.75

- Panelboards
- Circuit directory
- Fuses
- Circuit breakers
- Berth lights
- Globes and guards
- Explosion-proof or watertight (where required)

Notes: ___________________________________________________
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