Name of Vessel

Official Number | Class
---|---

Date Completed

Location

Vessel Built in Compliance with SOLAS: 60 74 74/78 NA

Inspection Type
- [ ] Inspection for Certification (COI)
- [ ] Annual
- [ ] Periodic
- [ ] Reinspection
  - [ ] First
  - [ ] Second
  - [ ] Third
  - [ ] Passenger vessels only
- [ ] Other __________

Inspectors
1. __________________
2. __________________
3. __________________
4. __________________
### 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>
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</tbody>
</table>

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

#### Reserve Personnel

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

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

#### Auxiliary Resources

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

### Conversions:

#### Distance and Energy

| Kilowatts (kW) X | 1.341 | Horsepower (hp) 
|------------------|-------|

| Feet (ft) X | 3.281 | Meters (m) 
|-------------|-------|

| Long Ton (LT) X | 0.98421 | Metric Ton (t) 
|-----------------|---------|

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

| Liquid | bbl/LT | m³/t | bbl/m³ | bbl/l
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></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 = 2240 lbs</th>
<th>1 Metric Ton = 2204 lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Short Ton = 2000 lbs</td>
<td>1 Cubic Foot = 7.48 gal</td>
</tr>
<tr>
<td>1 Barrel (oil) = 5.61 ft³ = 42 gal = 6.29 m³</td>
<td>1 psi = .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 | 80 = 26.7 | 200 = 93.3 |
| 32 = 0 | 90 = 32.2 | 250 = 121.1 |
| 40 = 4.4 | 100 = 37.8 | 300 = 148.9 |
| 50 = 10.0 | 110 = 43.3 | 400 = 204.4 |
| 60 = 15.6 | 120 = 48.9 | 500 = 260 |
| 70 = 21.1 | 150 = 65.6 | 1000 = 537.8 |

#### Pressure: Bars = Pounds per square inch

<table>
<thead>
<tr>
<th>1 Bar = 14.5 psi</th>
<th>5 Bars = 72.5 psi</th>
<th>9 Bars = 130.5 psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 bars = 29.0 psi</td>
<td>6 Bars = 87.0 psi</td>
<td>10 Bars = 145.0 psi</td>
</tr>
<tr>
<td>3 Bars = 43.5 psi</td>
<td>7 Bars = 101.5 psi</td>
<td></td>
</tr>
<tr>
<td>4 Bars = 58.0 psi</td>
<td>8 Bars = 116.0 psi</td>
<td></td>
</tr>
</tbody>
</table>
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.
<table>
<thead>
<tr>
<th>Section 1: Inspection Items</th>
<th>Deficiency</th>
<th>Req’l Issued/ Date Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boilers..........................</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Diesels..........................</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Pressure Vessels................</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Auxiliary Machinery ..........</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Electrical Systems............</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Firefighting Equipment .......</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Watertight Integrity ..........</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Pollution Prevention ..........</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Marine Sanitation Devices ...</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous ................</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section 2: Appendices</th>
<th>Deficiency</th>
<th>Req’l Issued/ Date Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended US Vessel Deficiency Procedures</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Deficiency Summary Worksheet</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Notes</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Conversions</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>

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>
</tr>
</thead>
<tbody>
<tr>
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Notes: ____________________________________________________
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# Section 2: Appendices

## 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:

**DOES immediately impact crew/passenger safety, hull seaworthiness, or the environment, and cannot be modified to meet less stringent requirements, e.g.,**

- Missing or defective firefighting equipment

**THEN issue CG-835:**

That requires the deficiency to be corrected prior to operating vessel ("NO SAIL" item), e.g.,

- Prior to carrying passengers
- Prior to carrying cargo

**IF deficiency:**

That provides a specific time for correcting deficiency, e.g.,

- "X" number of days

**THEN issue CG-835:**

That restricts operation of vessel to meet current vessel conditions, e.g.,

- Increased crew

**IF deficiency:**

That allows vessel operations to be MODIFIED to meet less stringent requirements, e.g.,

- Automation defect

**THEN issue CG-835:**

**IF deficiency:**

That does not immediately impact crew/passenger safety, hull seaworthiness, or the environment, e.g.,

- Missing placards

**THEN issue CG-835:**

Determines blowdown and ensures it is between 2% and 4% of lift pressure for each valve. Use the following calculations.

- 7a. 3a pressure – 3b pressure = blowdown
- 7b. 3a pressure x .02 (2%)
- 7c. 3a pressure x .04 (4%)

**IMPORTANT:** If 7a (blowdown) is not between 7b and 7c, blowdown setting MUST be adjusted within specified limits.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Enter CG-835 data in MISLE.</td>
</tr>
<tr>
<td>7</td>
<td>Initiate Report of Violation (ROV) if necessary.</td>
</tr>
</tbody>
</table>

### D/S = Drum Safety Valve  
**S/S = Superheater Safety Valve**  
**S/P = Superheater Pilot Valve**
Safety valves
- Relieving gear
- Escape pipes
- Drains

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

### Automation
- Reduced manning
  - Yes
  - No
- Approved test procedure
- Satisfactory test
- Reviewed logs/records
- Interviewed personnel

Notes: ______________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
Pollution Prevention:

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

- **Fusible plugs**
  - Examined
  - Renewed at this inspection

- **High pressure steam piping**
  - Steam piping > 3 inches subject to boiler pressure hydrostatically tested (46 CFR 61.05-10)
  - Lagging or insulation
  - Hangers or supports

- **Fuel systems**
  - Service and transfer pumps
  - Remote shutoff valves
  - Remote cutouts
  - Reliefs and bypass valves
  - Strainers
  - Drip pans
  - Torch pots
  - Piping
  - Heaters

- **Feedwater system (including condensate)**
  - Pumps
  - Injectors
  - Valves and controls
  - Water heaters (including deaerator)
  - Water regulators
  - Water level indicators
  - Grease extractors
  - Piping
  - Gauges and thermometers
  - Air ejectors
  - Condensers

**Notes:** ____________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

**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

**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

33 CFR 159.55
MSM Vol. II

- Certified for inspected vessels

MSM Vol. II

- Capacity satisfactory

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

<table>
<thead>
<tr>
<th>Boiler Number</th>
<th>Date Hydrostatically Tested</th>
<th>Fireside</th>
<th>Waterside</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Notes: ___________________________________________________  Notes: ____________________________________________________  Notes: _____________________________________________________  Notes: _________________________________________________________  Notes: _________________________________________________________
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:

- Pressure vessels hydrostatically tested or internally examined
  - 46 CFR 61.10
  - MSM Vol. II
  - MSM Vol. IV

<table>
<thead>
<tr>
<th>Service</th>
<th>MAWP</th>
<th>Date Tested or Examined Internally</th>
<th>Relief Valve Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

- Relief valves springs set within range
  - 46 CFR 54.15-10(g)

Auxiliary Machinery:

- Bilge and ballast systems
  - 46 CFR 56.50-50
  - 46 CFR 56.50-55
  - 46 CFR 56.50-57

- 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
  - 46 CFR 58.30

- Compressor
- Controls and gauges
- Relief valves

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

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

Evaporators
- 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
- Motors and pumps
- Telemotor or other control
- Indicators and alarms
- Instructions and markings
- Final emergency power source

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

Ship's service generators
- Protective guards
- Reverse power relay
- Overspeed trip (> 110% < 115%)
- Low oil pressure alarm / shutdown

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
- Overcurrent devices
- Circuit directory
- Locking device

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

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

Ship's service lighting systems
- Panelboards
- Circuit directory
- Fuses
- Circuit breakers
- Berth lights
- Globes and guards
- Explosion-proof or watertight (where required)

Notes:

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