Maritime CMMS Setup Guide

Implementing CMMS for Vessels, Fleets, and Maritime Operations

Why Maritime CMMS Is Different

Maintaining ships isn't like maintaining factories. Your challenges are unique:

Factory CMMS	Maritime CMMS
Fixed location	Asset moves globally
Consistent connectivity	Intermittent satellite/port connectivity
Local spare parts	Parts shipped to next port
Single jurisdiction	Multiple flag states, port states, class societies
Day shift maintenance	24/7 crew, rotating every 3-9 months
Planned outages	Maintenance while underway

This guide covers maritime-specific CMMS setup including SFI classification, regulatory compliance, and fleet-wide standardization.

Part 1: The SFI Group System

What Is SFI?

The SFI Group System is the international standard for classifying ship components. Developed in Norway in 1972, it's used by:

- 90%+ of commercial shipping
- All major class societies
- Most maritime CMMS platforms (AMOS, NS5, ShipManager, etc.)
- Shipyards, suppliers, and repair facilities worldwide

SFI provides a universal language for maritime maintenance.

SFI Structure

SFI codes are hierarchical:

```
Main Group (1 digit)   → Major function
Group (2 digits)       → System
Subgroup (3 digits)    → Component type
Detail Code (6 digits) → Specific item
Full Code (9-10 digits)→ With sequence number
```

Example:

```
6          → Machinery Main Components
61         → Diesel Engines, Main
611        → Engine Block
611.001    → Engine Block, Unit 1
611.001.01 → Specific part of engine block
```

Complete SFI Main Group Reference

Group	Name	Description
0	**Ship General**	Administrative functions
01	Certificates, Class	Class certificates, ISM, ISPS
02	Documentation	Drawings, manuals
03	Ship Particulars	Principal dimensions, capacity
04	Ship Contracts	Charter parties, agreements
1	**Hull**	
10	Hull General	Shell plating, framing
11	Frame & Hull	Frames, longitudinals
12	Fore Hull	Bow, bulbous bow
13	Aft Hull	Stern, transom
14	Upper Deck	Main deck structure

15	Hull Outfit	Rails, ladders, doors
2	**Cargo Equipment**	
20	Cargo Equipment General	
21	Cargo Holds	Hatch covers, tank tops
22	Cargo Handling	Cranes, derricks
23	Cargo Tank Systems	Cargo pumps, piping (tankers)
24	Ro-Ro Equipment	Ramps, car decks
25	Container Systems	Cell guides, lashing
3	**Ship Equipment**	
30	Ship Equipment General	
31	Mooring	Windlass, winches, lines
32	Anchoring	Anchor, chain, hawse pipe
33	Deck Machinery	Capstans, cranes
34	Navigation Equipment	Radar, GPS, AIS
35	Safety Equipment	Lifeboats, life rafts
36	Fire Fighting	Fixed systems, portable
4	**Ship Accommodation**	
40	Accommodation General	
41	Bridge	Wheelhouse structure
42	Crew Accommodation	Cabins, mess
43	Passenger Accommodation	(Cruise/ferry)
44	Sanitary Systems	Toilets, showers
45	Galley	Kitchen equipment
46	HVAC	Air conditioning, ventilation
5	**Equipment for Crew**	
50	Crew Equipment General	
51	Communication	Radios, satellite
52	Office Equipment	
53	Entertainment	(Cruise ships)
54	Workshop Equipment	Lathe, welding
6	**Machinery Main Components**	
60	Diesel Engines, Propulsion	Main engines
61	Diesel Engines, Auxiliary	Generators
62	Turbines	Steam/gas turbines
63	Propeller/Thrusters	Props, bow thrusters
64	Shafting	Shaft, bearings, seals
65	Gearboxes	Reduction gears
7	**Systems for Machinery**	
70	Fuel Oil Systems	Storage, transfer, purifiers
71	Lubricating Oil	Main engine, aux
72	Cooling Water	Sea water, fresh water
73	Compressed Air	Start air, control air
74	Steam Systems	Boilers, steam distribution
75	Exhaust Systems	Uptakes, silencers
76	Bilge/Ballast	Pumps, piping
8	**Ship Common Systems**	
80	Common Systems General	
81	Fresh Water	Potable, distilling
82	Sewage/Gray Water	Treatment, discharge
83	Fire Fighting (Machinery)	CO_2, foam systems
84	Control/Monitoring	Automation, alarms
85	Electrical Power	Generators, switchboards
86	Lighting	Navigation, interior
87	HVAC (Machinery Spaces)	ER ventilation

SFI Code Examples

Code	Description
601	Main Diesel Engine
601.001	Main Engine No. 1

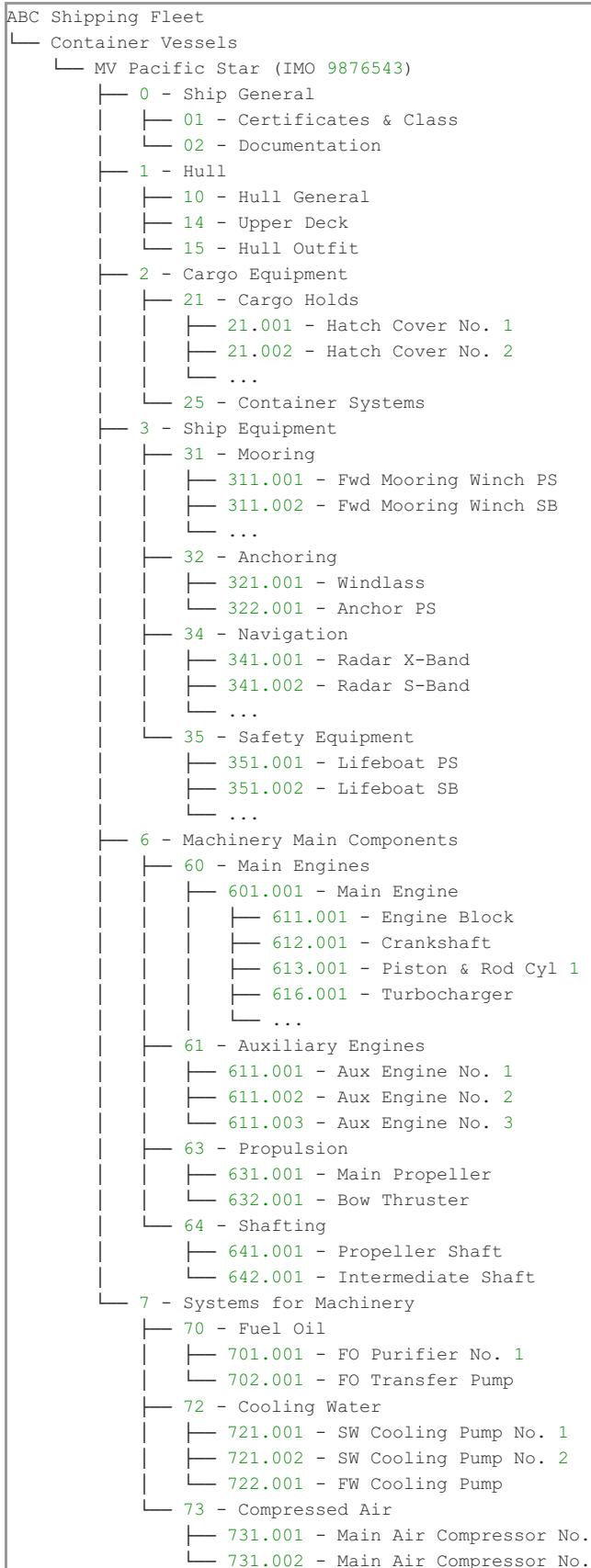|	
601.002	Main Engine No. 2
611	Engine Block
612	Crankshaft & Main Bearings
613	Connecting Rods & Pistons
614	Cylinder Heads & Valves
615	Camshaft & Valve Train
616	Turbocharger
617	Fuel Injection System
618	Exhaust System
641	Cooling Water Pumps
641.001	SW Cooling Pump No. 1
641.002	SW Cooling Pump No. 2
721	Sea Water Cooling System
722	Fresh Water Cooling System
731	Main Air Compressor
735	Stern Tube & Shaft Seals
735.001	Stern Tube Forward Seal
735.007	Stern Tube Aft Seal
851	Main Switchboard
852	Emergency Switchboard
853	Shore Connection

Part 2: Vessel Hierarchy Setup

Recommended Hierarchy Structure

```
Fleet
└── Vessel Type/Class
    └── Individual Vessel
        └── SFI Main Group (0-8)
            └── SFI Group (2-digit)
                └── SFI Subgroup (3-digit)
                    └── Equipment Item (with sequence)
                        └── Component (if tracked)
```

Example: Container Vessel Hierarchy

```
ABC Shipping Fleet
└── Container Vessels
    └── MV Pacific Star (IMO 9876543)
        ├── 0 - Ship General
        │   ├── 01 - Certificates & Class
        │   └── 02 - Documentation
        ├── 1 - Hull
        │   ├── 10 - Hull General
        │   ├── 14 - Upper Deck
        │   └── 15 - Hull Outfit
        ├── 2 - Cargo Equipment
        │   ├── 21 - Cargo Holds
        │   │   ├── 21.001 - Hatch Cover No. 1
        │   │   ├── 21.002 - Hatch Cover No. 2
        │   │   └── ...
        │   └── 25 - Container Systems
        ├── 3 - Ship Equipment
        │   ├── 31 - Mooring
        │   │   ├── 311.001 - Fwd Mooring Winch PS
        │   │   ├── 311.002 - Fwd Mooring Winch SB
        │   │   └── ...
        │   ├── 32 - Anchoring
        │   │   ├── 321.001 - Windlass
        │   │   └── 322.001 - Anchor PS
        │   ├── 34 - Navigation
        │   │   ├── 341.001 - Radar X-Band
        │   │   ├── 341.002 - Radar S-Band
        │   │   └── ...
        │   └── 35 - Safety Equipment
        │       ├── 351.001 - Lifeboat PS
        │       ├── 351.002 - Lifeboat SB
        │       └── ...
        ├── 6 - Machinery Main Components
        │   ├── 60 - Main Engines
        │   │   ├── 601.001 - Main Engine
        │   │   │   ├── 611.001 - Engine Block
        │   │   │   ├── 612.001 - Crankshaft
        │   │   │   ├── 613.001 - Piston & Rod Cyl 1
        │   │   │   ├── 616.001 - Turbocharger
        │   │   │   └── ...
        │   ├── 61 - Auxiliary Engines
        │   │   ├── 611.001 - Aux Engine No. 1
        │   │   ├── 611.002 - Aux Engine No. 2
        │   │   └── 611.003 - Aux Engine No. 3
        │   ├── 63 - Propulsion
        │   │   ├── 631.001 - Main Propeller
        │   │   └── 632.001 - Bow Thruster
        │   └── 64 - Shafting
        │       ├── 641.001 - Propeller Shaft
        │       └── 642.001 - Intermediate Shaft
        └── 7 - Systems for Machinery
            ├── 70 - Fuel Oil
            │   ├── 701.001 - FO Purifier No. 1
            │   └── 702.001 - FO Transfer Pump
            ├── 72 - Cooling Water
            │   ├── 721.001 - SW Cooling Pump No. 1
            │   ├── 721.002 - SW Cooling Pump No. 2
            │   └── 722.001 - FW Cooling Pump
            └── 73 - Compressed Air
                ├── 731.001 - Main Air Compressor No. 1
                └── 731.002 - Main Air Compressor No. 2
```

Vessel Identification Fields

Every vessel in your CMMS should have:

Field	Example	Notes
Vessel Name	MV Pacific Star	Official registered name
IMO Number	9876543	Unique, never changes

Call Sign	ABCD	Radio call sign
MMSI	123456789	Maritime Mobile Service Identity
Flag State	Panama	Registration country
Classification Society	DNV	Or Lloyd's, ABS, BV, etc.
Vessel Type	Container	Per class society definition
Gross Tonnage	45,000	From tonnage certificate
Deadweight	52,000	DWT
Year Built	2015	Keel laid or delivery
Shipyard	Hyundai Heavy	Builder
Hull Number	2456	Yard hull number

Part 3: Regulatory Compliance

ISM Code Requirements

The International Safety Management (ISM) Code mandates documented maintenance systems.

ISM Code Section 10: Maintenance of Ship and Equipment

Your CMMS must support:

Requirement	CMMS Implementation
10.1 - Procedures for maintenance	PM schedules, job plans
10.2 - Inspections at appropriate intervals	Inspection task types
10.3 - Reporting of non-conformities	Work orders, notifications
10.4 - Corrective action	Work order completion tracking
10.5 - Records of maintenance	Complete work history

Document Control:

- [ ] Maintenance procedures accessible on board
- [ ] Revision control for procedures
- [ ] Crew trained on procedures
- [ ] Master and officers can access records

Class Society Requirements

Continuous Survey Machinery (CSM):
Track survey items with due dates:

Equipment	Survey Interval	Last Survey	Next Due
Main Engine	Annual	2024-03-15	2025-03-15
Aux Engines	Annual	2024-03-15	2025-03-15
Boiler	Annual + 5-yr hydraulic	2024-03-15	2025-03-15
Steering Gear	Annual	2024-03-15	2025-03-15
Emergency Generator	Annual	2024-03-15	2025-03-15
Anchor Windlass	5-year	2022-03-15	2027-03-15

Hull Survey Cycles:

Survey	Interval	Window
Annual Survey	12 months	± 3 months
Intermediate Survey	2.5 years	Between 2nd-3rd annual
Special Survey (Dry Dock)	5 years	± 3 months
Bottom Survey	2.5 years	Can coincide with intermediate

Configure CMMS to:

- [ ] Track survey due dates per equipment
- [ ] Generate reminders 3 months before due
- [ ] Record survey findings
- [ ] Track condition of class items

SOLAS Equipment

Safety of Life at Sea (SOLAS) equipment requires specific maintenance:

Equipment	Inspection Interval	Maintenance Interval
Lifeboats	Weekly + Monthly	Annual service
Liferafts	Monthly	Annual service + 5-yr replacement
EPIRB	Monthly	Battery replacement per MFR
SART	Monthly	Battery per MFR
Fire Extinguishers	Monthly	Annual + 5-yr hydrotest
Fixed Fire Fighting	Weekly	Annual service
Breathing Apparatus	Monthly	Annual certification
Immersion Suits	Monthly visual	Annual inspection

Port State Control Preparation

Create checklist job plans for PSC readiness:

Machinery Items:

- [ ] Main engine operational and records current
- [ ] Generators operational with proper load sharing
- [ ] Steering gear operational with emergency
- [ ] Bilge pumps operational and tested
- [ ] Fire pumps operational
- [ ] Emergency generator starts and loads

Safety Items:

- [ ] All LSA inspection current
- [ ] Fire-fighting equipment serviced
- [ ] Emergency lighting functional
- [ ] Watertight doors operational
- [ ] Muster lists posted and current

Part 4: Running Hours & Counter-Based Maintenance

Critical Running Hour Meters

Equipment	Meter Type	Unit	Update Frequency
Main Engine	Running Hours	Hours	Daily
Auxiliary Engine 1	Running Hours	Hours	Daily
Auxiliary Engine 2	Running Hours	Hours	Daily
Auxiliary Engine 3	Running Hours	Hours	Daily
Bow Thruster	Running Hours	Hours	Per use
Emergency Generator	Running Hours	Hours	Per test/use
Incinerator	Running Hours	Hours	Per use
FO Purifier 1	Running Hours	Hours	Daily
FO Purifier 2	Running Hours	Hours	Daily
Main Air Compressor 1	Running Hours	Hours	Daily or weekly
Main Air Compressor 2	Running Hours	Hours	Daily or weekly

Counter-Based PM Examples

Equipment	PM Task	Trigger	Tolerance
Main Engine	Cylinder Inspection	8,000 hours	± 500 hours
Main Engine	Turbocharger Overhaul	12,000 hours	± 1,000 hours
Main Engine	Piston Overhaul	16,000 hours	± 1,000 hours
Main Engine	Major Overhaul	48,000 hours	Per condition
Aux Engine	Top End Overhaul	8,000 hours	± 500 hours
Aux Engine	Complete Overhaul	24,000 hours	± 2,000 hours
Air Compressor	Valve Inspection	4,000 hours	± 250 hours
Air Compressor	Complete Overhaul	16,000 hours	± 1,000 hours

Voyage-Based Tracking

Some maintenance triggers on voyages/port calls:

Task	Trigger	Example

Hull cleaning	Port call at facility	Every 18 months max
Propeller polish	Dry dock or diving	Every 30 months max
Anchoring gear test	Every voyage	Or weekly if not anchoring
Lifeboat launch	Monthly + port	Must be from water

Part 5: Spare Parts Management

Critical Spares List

Every vessel should have:

Main Engine Spares:

Item	Min Qty	Location	Lead Time
Cylinder liner	1	On board	12 weeks
Piston	1 complete	On board	12 weeks
Piston rings (1 cyl set)	2	On board	6 weeks
Connecting rod bearing	2	On board	6 weeks
Main bearing (crankpin)	1	On board	8 weeks
Fuel injector	2	On board	4 weeks
Fuel pump	1	On board	6 weeks
Turbocharger cartridge	1	On board	16 weeks
Cylinder head	1	Shore (class req)	12 weeks

Aux Engine Spares:

Item	Min Qty	Location	Lead Time
Cylinder head	1	On board	6 weeks
Injector	2	On board	2 weeks
Governor actuator	1	On board	4 weeks
Turbocharger cartridge	1	On board	8 weeks

Pumps & Rotating Equipment:

Item	Min Qty	Location	Lead Time
Mechanical seal (per pump type)	2	On board	2-4 weeks
Impeller wear rings	1 set	On board	4 weeks
Coupling element	2	On board	2 weeks
Bearing kit	2	On board	2 weeks

Global Logistics Considerations

Configure your CMMS for:

- **Multi-port delivery:** Specify delivery port when ordering
- **Agent network:** Store agent contacts per port
- **Lead time by region:** Adjust reorder points by vessel location
- **Emergency suppliers:** Pre-qualify suppliers in key ports
- **Courier options:** TNT, DHL, ship's agent

Part 6: Fleet Standardization

Sister Vessel Templates

When you have sister vessels (same design):

1. **Create master template vessel**

   - Complete SFI hierarchy
   - All equipment with specs
   - All PM schedules
   - All job plans

2. **Copy to each sister vessel**

   - Adjust serial numbers

- Adjust running hours
- Adjust survey dates

3. **Maintain consistency**

- PM changes apply to all sisters
- Job plan updates apply fleet-wide
- Spare parts common catalog

Equipment Standardization Across Fleet

Equipment Type	Standard Make/Model	Vessels Using	Notes
Main Engine	MAN B&W 6S60ME-C	8	Tier III
Aux Engine	Wärtsilä 6L20	12	
LO Purifier	Alfa Laval MOPX	15	
FO Purifier	Alfa Laval MOPX	15	
SW Pumps	Sulzer SNZ	20	
FW Generator	Alfa Laval D-Type	8	

Benefits of standardization:

- Common spare parts pool
- Consistent training
- Comparable performance data
- Bulk purchasing power

Failure Code Standardization

Use ISO 14224 failure modes across the fleet (see ISO 14224 guide):

Failure Mode	Code	Use For
External leak	ELP	Seal, gasket, flange leaks
Low output	LOO	Reduced flow, pressure, power
Fail to start	FTS	Won't start on demand
Vibration	VIB	Abnormal vibration
Overheating	OHE	High temperature
Spurious stop	UST	Unexpected shutdown

Part 7: Crew Change & Handover

CMMS Handover Checklist

Before crew change:

Outgoing Chief Engineer:

- [ ] Update all running hours
- [ ] Close completed work orders
- [ ] Document ongoing work (status, parts needed)
- [ ] List priority items for incoming CE
- [ ] Update deficiency log
- [ ] Ensure spare parts inventory accurate

Incoming Chief Engineer:

- [ ] Review open work orders
- [ ] Review overdue PMs
- [ ] Review deficiency log
- [ ] Review upcoming survey items
- [ ] Verify critical spares on board
- [ ] Familiarize with vessel-specific equipment

Knowledge Transfer Features

Your CMMS should support:

- **Work order comments:** Detailed notes on what was done
- **Equipment notes:** Vessel-specific quirks and tips
- **Photo attachments:** Before/after, installation details

- **Document links:** Manuals, drawings, procedures
- **Deficiency tracking:** Outstanding items with history

Part 8: CMMS Platform Comparison

Major Maritime CMMS Platforms

Platform	Vendor	Vessels	Strengths	Considerations
AMOS	SpecTec	20,000+	Most comprehensive, class approved	Complex, expensive
NS5	ABS Nautical	4,000+	ABS integration, US support	Less global
ShipManager	DNV	15,000+	DNV integration, analytics	DNV ecosystem
SERTICA	Logimatic	1,200+	Modern, user-friendly	Smaller market share
MESPAS	MESPAS	Growing	Cloud-native, affordable	Newer platform
Maximo	IBM	Varies	Enterprise integration	Not maritime-specific
SAP PM	SAP	Varies	ERP integration	Not maritime-specific

Minimum Requirements Checklist

- [ ] SFI hierarchy support
- [ ] Running hour tracking
- [ ] Counter-based PM scheduling
- [ ] Class society survey tracking
- [ ] ISM Code compliance features
- [ ] Offline capability (vessels at sea)
- [ ] Data sync (ship-shore)
- [ ] Multi-vessel management
- [ ] Spare parts with global logistics
- [ ] Document management
- [ ] Mobile/tablet interface
- [ ] Reporting and KPIs

Part 9: Implementation Checklist

Phase 1: Setup (Weeks 1-4)

Week 1: Fleet Structure

- [ ] Define fleet organization in CMMS
- [ ] Create vessel types/classes
- [ ] Enter vessel master data (IMO, flag, etc.)
- [ ] Configure user roles (Supt, CE, 2E, ETO)

Week 2: SFI Hierarchy

- [ ] Load SFI code master
- [ ] Build hierarchy for first vessel
- [ ] Add equipment specifications
- [ ] Link spare parts

Week 3: PM Setup

- [ ] Define PM schedules (time-based)
- [ ] Define PM schedules (counter-based)
- [ ] Create job plans with tasks
- [ ] Link job plans to equipment

Week 4: Survey & Compliance

- [ ] Set up class survey tracking
- [ ] Enter next survey due dates
- [ ] Create SOLAS equipment checklist
- [ ] Set up PSC readiness checklist

Phase 2: Data Migration (Weeks 5-8)

- [ ] Export data from legacy system
- [ ] Transform to CMMS format

- [ ] Load equipment data
- [ ] Load historical work orders (if migrating)
- [ ] Load spare parts catalog
- [ ] Validate data accuracy

Phase 3: Testing (Weeks 9-10)

- [ ] Test PM generation
- [ ] Test work order workflow
- [ ] Test spare parts requisition
- [ ] Test running hour updates
- [ ] Test ship-shore sync
- [ ] User acceptance testing

Phase 4: Rollout (Weeks 11-12)

- [ ] Train superintendents
- [ ] Train Chief Engineers
- [ ] Roll out to pilot vessel
- [ ] Monitor and adjust
- [ ] Roll out to fleet

Quick Reference: SFI Main Groups

0	Ship General	Certificates, docs
1	Hull	Structure, outfit
2	Cargo Equipment	Holds, handling, tanks
3	Ship Equipment	Mooring, nav, safety
4	Accommodation	Living spaces, galley
5	Crew Equipment	Comms, workshop
6	Machinery Main	Engines, props, shafts
7	Machinery Systems	Fuel, lube, cooling, air
8	Common Systems	Water, fire, electrical

Need help implementing maritime CMMS or standardizing your fleet data? AssetStage provides SFI hierarchy templates, data migration services, and fleet standardization consulting. Contact us at sales@assetstage.io

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