

SHIPBUILDER: _____

HULL NO.: _____

DATA FOR AUTOMATIC AND REMOTE CONTROL
OF MACHINERY SYSTEM

Diesel Ship

一般財団法人 日本海事協会

NIPPON KAIJI KYOKAI

Summary of Description

1. If the ships are designed in accordance with description of each column, marked "1" is to be entered in .
2. If applicable, letter or figure is to be entered in ().
3. If "Note" is necessary, blank space may be used additionally.

Contents

<p>1. General 1</p> <p>2. Location of Engine Control Room 1</p> <p>3. M/E & Propulsion Shafting System 1</p> <p style="padding-left: 20px;">(1) Control Station 1</p> <p style="padding-left: 20px;">(2) Safety System 2</p> <p>4. Boiler 3</p> <p style="padding-left: 20px;">(1) Control Station 3</p> <p style="padding-left: 20px;">(2) Automatic Control System 3</p> <p style="padding-left: 20px;">(3) Safety System 4</p> <p>5. Main Electric Generating Plant 4</p> <p style="padding-left: 20px;">(1) Kind & No. of Generating Plant 4</p> <p style="padding-left: 20px;">(2) Location of Main Switchboard 4</p> <p style="padding-left: 20px;">(3) Control Station 5</p>	<p>(4) Automatic Control System 6</p> <p>(5) Safety System 7</p> <p>6. Auxiliary Machinery 8</p> <p style="padding-left: 20px;">(1) Control of Pumps, Compressors & Fans 8</p> <p style="padding-left: 20px;">(2) Level & Temp. Control for Tanks 11</p> <p style="padding-left: 20px;">(3) Control of Heat Exchangers etc. 12</p> <p style="padding-left: 20px;">(4) Safety System 13</p> <p style="padding-left: 40px;">(i) Auto. Stop for Engine & Turbine 13</p> <p style="padding-left: 40px;">(ii) Auto. Stop for Compressor 13</p> <p>7. Monitoring & Alarm System 14</p> <p style="padding-left: 20px;">(1) General 14</p> <p style="padding-left: 20px;">(2) List of measuring & Alarm Point 14</p> <p>8. Others 17</p>
---	---

1. General

- The notation (MC) is acquired.
- The notation (MO) is acquired. [MO•A, MO•B, MO•C, MO•D]

2. Location of Engine Control Room

- In engine room () Deck Outside engine room () Deck
- Integrated in bridge

3. Main Engine and Propulsion Shafting System

(1) Control Station

Control Station Item		Bridge			Engine control room	Local	
		Maneuvering space	Engine control space				
Main Engine	Starting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Stopping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Reversing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Speed Control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Emergency Stop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C.P.P.	Brade Pitch Control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clutch for Propulsion	Engage•Disengage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reversing Gear	Ahead•Neutral•Astern	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(2) Safety System

Cause	Main Engine Auto. Stop	Main Eng.Auto. Load Reduction	C.P.P. Blade Angle Auto. Reduction	Alarm for Necessity of Manual Load Reduction
	(Note1)	(Note1)	(Note1)	(Note2)
Over speed	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
Low press. of main lub. oil	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
Low press. of crosshead bearings lub. oil	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
Low press. of camshaft lub. oil	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
High concentration of crank case oil mist	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
High temp. of main lub. oil inlet	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
High temp. of thrust bearing	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
Low flow or non flow of cyl. oil	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
Low press. or flow of piston cool. water(oil)	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
High temp. of piston coolant outlet	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
Low press. or flow of cyl. cool. water	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
High temp. of cyl. cooling water outlet	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
Fire or high temp. of scavenge air space	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
High temp. of stern tube bearing	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()
	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> []	<input type="checkbox"/> ()

(Note1) If pre-warning alarm and override device are provided, mark [] with ※

(Note2) Alarming position for necessity of manual load reduction is to be entered in ()

4. Boiler

(1) Control Station

Control Station Item	Bridge	Engine Control Room	Local		
Ignition • Firing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire Extinguishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soot Blow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emerg. Stop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(2) Automatic Control System

Automatic combustion control device is provided.

Pressure Control System

ON — OFF Control

ON — LOW — HIGH — LOW — OFF Control

Control of the number of firing burners

Proportional control

Combination control of the () system and () system

Others ()

Automatic feed water control device is provided.

Feed Water Control System

ON — OFF control of the feed water pump

Feed water flow rate control by means of the feed water control valve

Steam flow rate control for the feed water pump turbine

Other(s) ()

(3) Safety System

Fuel oil shut off	Cause	Fuel oil Shut off	Cause
<input type="checkbox"/>	Miss fire	<input type="checkbox"/>	Source failure
<input type="checkbox"/>	Flame failure	<input type="checkbox"/>	Low temp. of fuel oil
<input type="checkbox"/>	Abnormal low water level	<input type="checkbox"/>	High temp. of exhaust gas
<input type="checkbox"/>	Combustion air failure	<input type="checkbox"/>	High temp. of fuel oil
<input type="checkbox"/>	Low press. of fuel oil	<input type="checkbox"/>	
<input type="checkbox"/>	Low press. of atomizing steam	<input type="checkbox"/>	
<input type="checkbox"/>	Abnormal high temp. of thermal oil	<input type="checkbox"/>	Low level of expansion tank for thermal oil
<input type="checkbox"/>	Low flow rate / Low differential Pressure of thermal oil	<input type="checkbox"/>	

5. Main Electric Generating Plant

(1) Kind & Number of Main Elect.

Diesel generator () Sets
 Steam Turbine Generator () Sets
 Main shaft driven or main engine driven Generator () Sets
 Others () () Sets

(2) Location of Main Switchboard

In engine control room Outside engine control room

(3) Control Station

Control Station		Bridge	Engine Control Room	Main Switchboard	Engine Side	
Item						
Diesel Generator	Starting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Stopping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Speed control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Breaker close & open	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Stand-by Selection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Emergency stop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steam Turbine Generator	Starting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Stopping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Speed control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Breaker close & open	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Emergency stop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Synchronizing		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Load sharing		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(4) Automatic Control System

- The automatic synchronizing device is provided.
- The automatic load sharing device is provided.
- The automatic starting device for stand by generator is provided.
- The automatic control device of number of generators on line is provided.

If the exhaust gas turbine generator is provided,

— The following means are provided against reduction of main engine output.

- The boiler is automatically fired to supply steam without interruption for electric generation.
- The turbine generator is automatically transferred to the stand by generator.
- Others ()

— Detecting means for reduction of main engine output are as follows:—

- | | |
|--|---|
| <input type="checkbox"/> No. of main engine revolutions | <input type="checkbox"/> Temp.of main engine exhaust gas |
| <input type="checkbox"/> Press. of boiler or turbine inlet steam | <input type="checkbox"/> Temp. of steam |
| <input type="checkbox"/> Main engine fuel handle position | <input type="checkbox"/> Engine telegraph handle position |
| <input type="checkbox"/> Frequency | <input type="checkbox"/> Voltage |
| <input type="checkbox"/> Other(s)() | |

— The optimum load sharing control system is adopted during parallel operation with other generators.

If the main shaft or main engine driven generator (herein after referred to as“shaft generator”) is provided,

— A constant frequency control equipment (constant speed control equipment) is provided as follows:—

- | | |
|---|---|
| <input type="checkbox"/> Hydraulic multiple disc clutch | <input type="checkbox"/> Thyristerconverter•inverter |
| <input type="checkbox"/> Differential epicycle gear | <input type="checkbox"/> Eddy current coupling (Electromagnetic clutch) |
| <input type="checkbox"/> Hydraulic oil converter (Hydraulic oil pump/
Motor control) | <input type="checkbox"/> Other(s)() |

— The shaft generator is also driven by any other prime mover than main engine.

— In the case of reduction in the main engine speed, means are provided as follows:—

The shaft generator is automatically transferred to the stand by generator.

The driving power for the shaft generator is automatically transferred to a separate prime mover as used for back up.

Others ()

— Detecting means for reduction of main engine speed are as follows:—

Main engine fuel oil handle position

Engine telegraph handle position

Frequency

Voltage

Others ()

(5) Safety System

Kind	Auto. Stop	Cause	Auto. Stop	Cause
Diesel Generator	<input type="checkbox"/>	Over speed	<input type="checkbox"/>	Low press. of cyl. cooling water engine inlet
	<input type="checkbox"/>	Low press. of lub. oil engine inlet	<input type="checkbox"/>	Low flow of cyl. cooling water engine inlet
	<input type="checkbox"/>	High temp. of lub . oil engine inlet	<input type="checkbox"/>	High concentration of crank case oil mist
	<input type="checkbox"/>	High temp. of cyl. cooling water engine outlet	<input type="checkbox"/>	
Steam Turbine Generator	<input type="checkbox"/>	Over speed	<input type="checkbox"/>	Excessive axial displacement of rotor
	<input type="checkbox"/>	Low press. of lub. oil turbine inlet	<input type="checkbox"/>	
	<input type="checkbox"/>	High press. of back press. (low vacuum of aux. condenser)	<input type="checkbox"/>	
	<input type="checkbox"/>	Excessive vibration of rotor or casing	<input type="checkbox"/>	

6. Auxiliary Machinery

(1) Control of Pumps, Compressors and Ventilation Fans

Item	Remote start and stop			Auto. Start- Stop	Auto. Change to ST/BY Machine	Sequential Start	
	Bridge	Eng. Control Room	()				
	Start•Stop	Start•Stop	Start•Stop				
Main diesel engine and propulsion shafting systems	Main lub. oil pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Crosshead lub. oil pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Turbo-charger lub. oil pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Camshaft lub. oil pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Reduction gear lub. oil pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Cyl. cooling pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Piston cooling pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fuel valve cooling pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Main cooling sea water pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fuel oil supply pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	C.P.P. control oil pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Stern tube lub. oil pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Aux. blower	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Item		Remote Start and Stop			Auto. Start-Stop Start•Stop	Auto Change to ST/BY Machine	Sequential Start
		Bridge	Eng. Control Room	()			
		Start•Stop	Start•Stop	Start•Stop			
Aux. boiler	Feed water pump (Main)	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feed water pump (aux.)	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Boiler water circulating pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Burning pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Forced draft fan	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Thermal fluid oil circulating pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generator diesel	Stand by lub. oil pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Lub. oil priming pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Cyl. cooling pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Cooler cooling sea water pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fuel oil supply pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generator steam diesel	Stand by lub. oil pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Circulating (cooling sea water) pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Condensate pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Item		Remote Start and Stop			Auto. Start- Stop	Auto Change to ST/BY Machine	Sequential Start
		Bridge	Eng. Control Room	()			
		Start•Stop	Start•Stop	Start•Stop			
Generator steam turbine	Vacuum pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Auxiliaries	Bilge pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Ballast pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	G.S pump (for fire,bilge)	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Ballast pump (for fire, bilge)	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	() pump (for fire, bilge)	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Diesel fuel oil transfer pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Heavy fuel oil transfer pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Steering gear oil pump	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Main air compressor	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Aux. Air compressor	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Control air compressor	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Ventilation fan in engine room	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exhaust fan for purifier space	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/> • <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(2) Level and Temperature Control for Tanks

Item	Auto. Transfer to tank	Heating		Item	Auto. Transfer to tank	Heating		
		Provided	Auto. Temp.Cont.			Provided	Auto. Temp.Cont.	
Fuel oil tanks	Heavy fuel oil settling tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Save-all tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Heavy fuel oil service tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Drain tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Diesel fuel oil settling tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sludge tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Diesel fuel oil service tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fuel valve cooling oil tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Blend oil tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	West oil tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others	Cascade tank	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	

(3) Control of Heat Exchangers etc.

Item		Auto Control	Item		Auto Control
Main engine and propulsion shafting systems	Temp.,main lub. oil	<input type="checkbox"/>	Generator diesel	Temp.,lub.oil	<input type="checkbox"/>
	Temp.,turbo-charger lub. oil	<input type="checkbox"/>		Temp.,cyl. cooling water	<input type="checkbox"/>
	Temp.,camshaft lub. oil	<input type="checkbox"/>		Temp.,fuel oil	<input type="checkbox"/>
		<input type="checkbox"/>		Viscosity,fuel oil	<input type="checkbox"/>
	Temp.,cyl. cooling water	<input type="checkbox"/>			<input type="checkbox"/>
	Temp.,piston cooling water (oil)	<input type="checkbox"/>			<input type="checkbox"/>
	Temp.,fuel valve cooling water (oil)	<input type="checkbox"/>	Generator steam turbine	Temp.,lub.oil	<input type="checkbox"/>
		<input type="checkbox"/>		Press.,gland steam	<input type="checkbox"/>
	Temp.,fuel oil	<input type="checkbox"/>		Level,aux. condenser	<input type="checkbox"/>
	燃料油粘度 Viscosity, fuel oil	<input type="checkbox"/>			<input type="checkbox"/>
		<input type="checkbox"/>			<input type="checkbox"/>
	Temp.,scavenging air	<input type="checkbox"/>	Others	Temp.,fuel oil purifier inlet	<input type="checkbox"/>
	Temp.,stern tube lub. oil	<input type="checkbox"/>		Temp.,lub. oil purifier inlet	<input type="checkbox"/>
Temp.,reduction gear lub. oil	<input type="checkbox"/>	Temp.,starting air compressor cooling water		<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
Aux. boiler	Temp.,fuel oil	<input type="checkbox"/>		<input type="checkbox"/>	
	Temp.,feed water	<input type="checkbox"/>		<input type="checkbox"/>	
		<input type="checkbox"/>		<input type="checkbox"/>	
		<input type="checkbox"/>		<input type="checkbox"/>	

(4) Safety system

(i) Automatic stop for diesel engine and steam turbine

Service	Kind of Prime Movers (Note)	Over speed	Low press. of lub. oil	High temp. of cooling water	Low press. of coolingwater	Low vacuum or high ex-haust steam press.	Excessive vibration	
Air compressor	D•T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feed water pump	D•T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ballast pump	D•T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	D•T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	D•T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Note) D(Diesel Engine) and T(Steam Turbine) should be enclosed with a circle according to kind of prime mover.

(ii) Automatic stop for air compressor

Service	Low press. of lub. oil	Low press.of cooling water	Low flow of cooling water	High temp. of Compressed air		
Main air compressor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aux.air compressor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Control air compressor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Monitoring and Alarm System

(1) General

— The CRT displays and associating apparatus are adopted for the monitoring and alarm system.

Equipments \ Location		Bridge		Engine control room	Cargo control room		
		Maneuvering space	Engine control space				
CRT Display	For engine	() Sets	() Sets	() Sets	() Sets	() Sets	() Sets
	For cargo	()	()	()	()	()	()
Typewriter		()	()	()	()	()	()
Printer		()	()	()	()	()	()
		()	()	()	()	()	()

— The extension alarm devices are provided at the following stations

- Each engineer's accommodation room
- Dining room
- Recreation room
- Saloon
- Office
- Bridge
- Others (_____, _____, _____, _____)

(2) List of measuring point and alarm point for machinery system

List of measuring and alarm point for machinery system should be attached to this booklet.

The format of the list is free provided that the list is at least included such the list of measurement, indication and alarm as shown to the following example.

Attached from may be used to make the list, if necessary.

For example

List of measuring and alarm point for machinery system

Object/ Division	Location		Bridge		Engine control room	Work Shop		Note	
			Maneuvering space	Engine control space					
Main Engine	Indication	Revolution	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
		Temp. of exhaust gas each cyl. outlet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
		Press. of governor setting air	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Ahead/Astern indication of cam shaft	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Aux. blower running	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Alarms	Temp.	High Temp. of cooling water each cyl. outlet	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
			High & Low Temp. of F. O. injection pump inlet	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
		Press.	Low press. of main L. O. inlet	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
			Low press. of control air	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
			High differential press. L. O. filter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

8. Others

Devices for stand by sequence control of machinery system are provided.

Local Area Network (LAN) system is adopted.

Condition monitoring devices of machinery system are provided.

Voice control devices are used for the following purpose.

(Purpose)

Voice alarm devices are adopted for the following system.

(System)

Electronic control devices for main engine are provided for the following system.

(System)

- Electronic speed governing system
- Cylinder oil timing control system
- Others ()