

Methods of Onboard Test on Automatic Control of Cooling Water System for Smaller Ships

1. Scope

This Japanese Industrial Standard specifies method of onboard test on automatic control of cooling water system for machinery part in smaller ships.

2. Test Items

The test shall be carried out for following systems.

- (1) Remote control system of cooling water pumps
- (2) Automatic changing system of cooling water pumps
- (3) Automatic temperature regulation system for cooling water
- (4) Temperature rise alarming system for cooling water
- (5) Pressure down alarming system for cooling water
- (6) Automatic feeding system of cooling fresh water tank
- (7) Level alarming system of cooling fresh water tank

3. Preparation of Test

Before tests, the following preparations shall be carried out.

- (1) Detectors of automation system shall be properly arranged.
- (2) Voltage and frequency of power supply used for tests shall be designed value.
- (3) The condition of piping, opening or closing of each valve and measuring instruments, etc., shall be properly as design.

4. Testing Method

4.1 Testing Method of Remote Control System of Cooling Water Pump The test shall be carried out as follows.

- (1) By starting and stopping the pump by remote on-off push button, operation of the pump shall be checked.
- (2) Lightening of the running pilot lamp of the pump, usually, installed in a control room, shall be checked.

4.2 Testing Method of Automatic Changing System of Cooling Water Pump

4.2.1 Test of Automatic Changing by Low Pressure The test shall be carried out as given in Table 1.

By starting No. 1 pump, stop state operator's regulation	6	electric power, and starting automatically No. 2 pump
By starting No. 1 pump, check pressure of pumps	2	

By starting No. 2 pump, changing to No. 1 pump shall be carried out as test No. 1 - 6

Table 1

Test method	Test No.	Check items
Supplying electric power to No. 1 pump and No. 2 pumps	1	Checking lightening power supply pilot lamp
	2	Checking the set pressure of pressure switch to be corresponded with rated pressure
Start No. 1 pump, and change to automatic selection switch of auto or manual	3	Checking lightening running indicator lamp of No. 1 pump
	4	Ampere and delivery pressure of No. 1 pump shall be checked to be normal
After steadying delivery pressure of No. 1 pump, the cooling water pressure in the inlet of main engine shall be decreased gradually, by regulating the delivery valve of No. 1 pump	5	By operating of pressure switch, shall be checked automatically to start No. 2 pump and to stop No. 1 pump
	6	When No. 1 pump stopped, shall be checked to be normal operating the pump stop alarm
	7	Checking lightening of the running lamp of No. 2 pump
	8	Ampere and delivery pressure of No. 2 pump shall be checked to be normal
	9	Immediately before No. 2 pump automatically starting, by measuring delivery pressure of No. 1 pump, set pressure shall be checked to be corresponded with rated pressure

By starting No. 2 pump, changing to No. 1 pump shall be carried out as tests No. 1 ~ 9.

4.2.2 Test of Automatic Changing by Power Failure The test shall be carried out as given in Table 2.

Table 2

Test method	Test No.	Check items
Supplying electric supply to No. 1 and No. 2 pumps	1	Checking lightening power supply pilot lamp
By starting No. 1 pump, and changing to automatic control	2	Checking lightening of the running pilot lamp
	3	Ampere and delivery pressure of pumps shall be regular
Stopping No. 1 pump with cutting off electric source, and starting automatically No. 2 pump	4	Checking lightening of the running pilot lamp
	5	Ampere and delivery pressure of pumps shall be regular
	6	By stopping No. 1 pump, checking pump stop alarm operate regularly

By starting No. 2 pump, changing to No. 1 pump shall be carried out as test No. 1 ~ 6

4.3 Testing Method of Automatic Temperature Regulation System of Cooling Water When the machinery is in operation, the automatically regulating temperature of cooling water shall be checked by thermometer to be within setting temperature.

4.4 Testing Method of High-temperature Alarm System of Cooling Water By artificially raising the temperature of thermal detector, operation of alarm and lightening of alarm pilot lamp shall be checked.

4.5 Testing Method of Low Pressure Alarm System of Cooling Water By lowering pressure at inlet of cooling water to main engine, operation of alarm and lightening alarm pilot lamp shall be checked.

4.6 Testing Method of Automatic Supplying System to Cooling Fresh Water Tank The tests of automatic supplying system to cooling fresh water tank shall be carried out as follows.