

Methods of Onboard Test on Automatic Control of Fuel Oil System for Smaller Ships

1. Scope

This Japanese Industrial Standard specifies the method of onboard test on automatic control of fuel oil system for smaller ships.

2. Test Items

Tests of the following systems shall be carried out.

- (1) Remote control system of fuel oil supply pumps.
- (2) Automatic changing system of fuel oil supply pumps.
- (3) Automatic supplying system to fuel oil tank.
- (4) Continuous purifying system of fuel oil.
- (5) Changing system of fuel oil.
- (6) Low pressure alarm system of fuel oil.
- (7) High or low temperature alarm system of fuel oil.
- (8) Level alarm system of fuel oil tanks.
- (9) Automatic temperature regulation system of fuel oil.
- (10) Remote level indicating system of fuel oil tanks.

3. Preparations for Test

Before tests, following preparations shall be carried out.

- (1) Detectors of automation system shall be properly arranged.
- (2) Voltage and frequency of electric source used for tests shall be designed values.
- (3) The condition of piping, opening or closing of each valve and measuring instruments, etc., shall be as designed.
- (4) If necessary, specific weight and volume of fuel oil shall be measured.

4. Testing Method

4.1 Testing Method of Remote Control System of Fuel Oil Supply Pumps 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 Fuel Oil Supply Pumps.

4.2.1 Test of Automatic Changing by low Pressure The test shall be carried out as follows.

- (1) By supplying electric power to No. 1 and No. 2 pumps, lightening of the power supply pilot lamp shall be checked.
- (2) Pressure switch shall be set to designed pressure.
- (3) By starting No. 1 pump and changing to automatic control, the running pilot lamp, ampere meter and delivery pressure of the pump shall be checked.
- (4) After steadying delivery pressure of pump, by adjusting the pressure regulating valve or through piping for tests, decreasing gradually the delivery pressure, operation of the pressure switch, automatic starting of No. 2 pump, automatic stopping of No. 1 pump and alarm of No. 1 pump stop shall be checked.
At this time, lightening of the running pilot lamp, ampere meter and delivery pressure of No. 2 pump shall be checked.
- (5) The delivery pressure of No. 1 pump, measured immediately before automatic start of No. 2 pump, shall be checked to correspond with set value of pressure switch.
- (6) By starting No. 2 pump, changing to No. 1 pump shall be carried out in a similar method as above.
(3) ~ (5).

4.2.2 Test of Automatic Changing by Power Failure

The test shall be carried out as follows.

- (1) By supplying electric power to No. 1 and No. 2 pumps, lightening of the power supply pilot lamps shall be checked.
- (2) By starting No. 1 pump and changing to automatic control, the running pilot lamp, ampere meter and delivery pressure of the pump shall be checked.
- (3) By stopping No. 1 pump with cutting off the power supply, automatic start of No. 2 pump, lightening of the running pilot lamp, ampere meter and delivery pressure of the pump shall be checked.
- (4) By starting No. 2 pump, changing to No. 1 pump shall be carried out in a similar way as above (2) ~ (3).

4.3 Testing Method of Automatic Supplying System to Fuel Oil Tank

The test shall be carried out as follows.

- (1) Automatic starting of a fuel oil transfer pump by low level signal of the fuel oil tank shall be checked. At this time, lightening of the running pilot lamp, ampere meter and delivery pressure of the pump shall be checked.
- (2) After checking 4.3 (1), automatic stopping of the fuel oil transfer pump by high level signal of the tank shall be checked.

4.4 Testing Method of Continuous Purifying System of Fuel Oil

The test shall be carried out as follows.

- (1) Continuous purifying of fuel oil by operating fuel oil purifier during navigation shall be checked.
- (2) Onboard test of fuel oil purifier shall conform to JIS F 6602.
- (3) Flow of oil through automatic washing strainer shall be checked by pressure difference measured between its inlet and outlet.

4.5 Testing Method of Charging System of Fuel Oils

By actual changing of heavy oil, (A to C or C to A) during navigation the changing over valve shall be checked.

At this time, the temperature of fuel oil inlet at main engine and changing duration for ships provided with automatic changing system shall be measured.

4.6 Testing Method of Low Pressure Alarm System of Fuel Oil

By lowering pressure at the inlet of fuel oil main pipe to main engine, operation of alarm and lightening alarm pilot lamp shall be checked.

4.7 Test Method of High or Low Temperature Alarm System of Fuel Oil

By artificially raising or lowering the temperature of thermal detector, operation of alarm and lightening of alarm pilot lamp shall be checked.

4.8 Testing Method of Level Alarm System of Fuel Oil Tanks

By artificially high or low leveling of fuel oil tanks, operation of level detecting switch shall be checked. At this time, alarming and lightening of alarm pilot lamps shall be checked.

4.9 Testing Method of Automatic Temperature Regulation System of Fuel Oil

Automatically regulated fuel oil temperature at following positions shall be checked thermometer to regulate within each setting temperature range.

- Inlet to main engine
- Inlet to purifier
- Setting tank
- Service tank

4.10 Testing Method of Remote Level Indicating System of Fuel Oil Tank

4.10.1 Electric Type

The test shall be carried out as follows.

- (1) By artificially moving the float, levels indicated by remote level indicating system shall be checked.
- (2) Indicated level shall be checked to correspond with actual level within practically allowable difference.

4.10.2 Air Purging Type

The test shall be carried out as follows

- (1) Height between purging pipe lower end and tank bottom shall be checked.
- (2) By air purging, indicated level shall be checked to correspond with actual level taking into consideration of specific weight difference of the fuel oil, within practically allowable difference.
- (3) Indicated level difference caused by the fuel oil specific weight shall be corrected.

Reference Standard:

JIS F 6602 — Methods of Onboard Test for Oil Purifier of Sludge Automatic Discharge Type for Smaller Ships



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