

Methods of Onboard Test on Automatic Control of Compressed Air, Bilge, Fresh Water and Sanitary Systems for Smaller Ships

1. Scope

This Japanese Industrial Standard specifies methods of onboard test on automatic control of compressed air, bilge, fresh water and sanitary systems for smaller ships.

2. Test Items

2.1 Compressed Air System Testing items for compressed air system shall be as follows.

- (1) Remote on-off system of air compressor
- (2) Automatic on-off system of air compressor
- (3) Low-pressure alarm system for compressed air
- (4) Main valve closing alarm system of control air

2.2 Bilge System Testing items for bilge system shall be as follows.

- (1) High level alarm system of bilge system
- (2) Automatic on-off system of bilge pump
- (3) Automatic discharge system of oil-water separator

2.3 Fresh Water and Sanitary System Testing items for fresh water and sanitary system shall be as follows.

- (1) Automatic on-off system of pumps

3. Preparation of Test

Before the tests, the following preparations shall be carried out.

- (1) Detectors of automation systems 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 instrument, etc., shall be properly as design.

4. Testing Method

4.1 Testing Method of Compressed Air System

4.1.1 Test Method of Remote On-Off System of Air Compressor

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

4.1.2 Test Method of Automatic On-Off System of Air Compressor The air compressor shall be driven by electric motor or generator engine with clutch, and the test of automatic on-off system shall be carried out as follows.

(1) In case of electric motor driven air compressor

- (a) By supplying electric power to air compressor, lightening of the power supply pilot lamp shall be checked. By starting the air compressor by manual switch the operation of drain discharge shall be checked, and the air compressor shall be stopped manually after fully filled compressed air to air reservoir.
- (b) When the air pressure in the air reservoir is gradually decreased to lower limit pressure by changing selector switch to automatic, and opening drain valve of air reservoir, shall be checked to automatically starting the compressor and to automatically discharging drain.
- (c) When the air pressure in the air reservoir increase to upper limit pressure, shall be checked to automatically stopping the compressor and to automatically discharging drain.
- (d) Air pressure in air reservoir measured at compressor starting and stopping shall be checked to corresponding with the set pressure.

- (e) Lightening of the running pilot lamp of the air compressor, usually installed in a control room, shall be checked.
- (2) **In case of generator engine driven air compressor with clutch**
 - (a) The operation of clutch shall be checked manually.
 - (b) Starting the compressor manually, the operation of drain discharging shall be checked, and filling air reservoir full, then stopping the compressor by manually.
 - (c) Changing turn over switch to automatic, opening drain valve of air reservoir, decreasing gradually air pressure of air reservoir to lower limit setting pressure, clutch-on and automatic start of the compressor and automatic discharge of drain shall be checked.
 - (d) Increasing pressure of air reservoir to upper limit setting pressure, clutch-off and automatic stop of the compressor and automatic discharge of drain shall be checked.
 - (e) Measuring the pressure of air reservoir at start and stop of compressor, the pressure shall be checked to correspond with the setting pressure of pressure switch.
 - (f) Lightening the running pilot lamp usually installed in control room shall be checked.

4.1.3 Test Method of Low-pressure Alarm System for Compressed Air Low-pressure alarm system for compressed air shall be checked to alarm at lower limit setting pressure, decreasing air pressure in air reservoir or control air pipe line, and lightening of the alarm pilot lamp shall be checked.

4.1.4 Test Method of Main Valve Closing Alarm System of Control Air Main valve closing alarm system of control air shall be checked to alarming and lightening of the alarm pilot lamp by artificially closing main valve of air reservoir or control air pipe line.

4.2 Testing Method of Bilge Line

4.2.1 Test Method of High Level Alarm System of Bilge System High level alarm system of bilge system shall be checked to alarming and lightening of alarm pilot lamp, by artificially high leveling, or manually moving the float of the bilge well.

4.2.2 Test Method of Automatic On-Off System of Bilge Pump Automatic on-off system of bilge pump shall be tested as follows.

- (1) Supplying electric power, lightening of the power supply pilot lamp shall be checked, and the bilge pump shall be checked operation by manually starting, and then pump shall be stopped.
- (2) Changing turn over switch to automatic, the pump shall be checked to automatically start at high water level in bilge well, and to lightening of running pilot lamp of bilge pump.
- (3) The pump shall be checked to automatically stop at low water level in bilge well.

4.2.3 Test Method of Automatic Oil Discharge System of Oil-water Separator The automatic oil discharge system of oil-water separator shall be tested as follows.

- (1) Before the operation test, oil-water separator shall be filled full water.
- (2) Supplying oily water to the separator by bilge pump, the solenoid valve for oil discharge shall be checked to opening at lower boundary level of oil and water, and to closing at upper boundary level of oil and water.
At this time, lightening of pilot lamp of oil discharging shall be checked.
And this test may be carried out to using boundary level of air and water instead of oil and water.

4.3 Testing Method of Fresh and Sanitary Water System

4.3.1 Test Method of Automatic On-Off System of Pump The type of fresh and sanitary water system shall be hydrophore system or gravity tank system, and the test of system shall be carried out as follows.

(1) Hydrophore tank system

- (a) Filling water into hydrophore tank to the level designed with the water pump and charging the compressed air into the tank to the pressure designed.
- (b) Releasing the water in the tank through drain valve opened to reduce the pressure in the tank, checking the system capable of filling water into the tank with the pump that should start automatically with the pressure designed to allow it to run.
- (c) The pressure increasing after filling water into the tank, and checking the system capable of stopping the water pump with the pressure designed.
- (d) Checking set point of pressure switch to be coincident with the reading of the gauge in the tank when on-off.