



Australian Government

Australian Maritime Safety Authority

INITIAL MACHINERY & ENGINEERING SURVEY REPORT

Marine Safety (Domestic Commercial Vessel) National Law Act 2012

Marine Order 503 (Certificates of survey – national law) 2018

National Law – Marine Surveyors Accreditation Guidance Manual 2014

This report is the National Regulator's preferred method for surveyors to monitor and record the *initial construction or alteration – machinery and engineering* survey. It is a minimum set of information expected by the National Regulator, it is not intended to be an exhaustive list.

Survey Details

Vessel name

Unique identifier

Details and serial number of main engine(s)

Name of Surveyor

Result - In order (Y) / Not In order (N) / Not Applicable (NA)

Bilge System

Item	Survey checks	Y/N/NA	Surveyor Comments/ drawing / document reference
Bilge pump number, type and capacity	Confirm pump design requirement Confirm pump specification is suitable Verify / inspect pump/s are installed Retain record of compliance		
Bilge system piping	Confirm piping design material diameter and thickness requirement Confirm pipe material specification is suitable Verify pipes are installed as per design		
Flexible hose installations	Determine minimum bend radius and maximum lengths Measure installed bend radius and lengths Confirm correct pipe terminations		
Bilge system arranged to prevent back flooding	Confirm back flooding design requirement Verify / inspect installation		
Bilge suction arrangement	Confirm bilge suction design is arranged to facilitate drainage of water over a range of heels Verify / inspect installation		
Drive mechanism for pumps are guarded	Inspect guards are in place and suitable		
Bilge suction strainer (for vessels ≥ 20m)	Inspect bilge suction pipes are fitted with a mud box, strum box or strainer		
Bilge Manifold with non-return valves (for vessels ≥ 25m)	Confirm design requirement Verify / inspect installation		

Inlets & Discharges

Item	Survey checks	Y/N/NA	Surveyor Comments/ drawing / document reference
Arrangement and type of inlet and discharge valves or cocks	Confirm inlet and discharge valve design requirement Verify / inspect installation for correct type and arrangement		
Valves and cocks material	Confirm required valve material (bronze, ductile steel or equivalent specifications) Verify / inspect valves installed Retain record of compliance		
Valves greater than 50mm bore are flanged type	Verify valves greater than 50mm bore are flanged type		
Stand pipes are at least 1.25 times the required thickness of the hull plating	Confirm design requirement Verify / inspect installation		
Sea inlet gratings	Confirm design requirement for removable gratings for sea inlets Verify / inspect gratings are fitted on the outside of all seawater inlets		

Fuel Systems

Item	Survey checks	Y/N/NA	Surveyor Comments/ drawing / document reference
Non-portable tank location	Verify fuel tanks are located, not over accesses, hot surfaces, electrical equipment or ignition surfaces Verify fuel tanks are adequately supported		
Additional requirements for fuel with flashpoints less than 60°C	Verify tank installation meets additional requirement for low flashpoint fuels (NSCV C5A 4.10) eg compartment etc		
Ventilation	Verify tank spaces are adequately ventilated to open air Verify each tank is fitted with a vent pipe, remote from tank space vent		
Fuel lines	Verify fuel lines are of the correct type and end fittings		
Fuel system electrical bonding	Verify metallic fuel system components are electrically bonded		
Remote fuel shut-off	Verify fuel shut off valve is correctly configured Witness function test of fuel shut off valve		

Exhaust System

Item	Survey checks	Y/N/NA	Surveyor Comments/ drawing / document reference
Exhaust piping	Confirm piping specifications is suitable Verify / inspect installed piping		
Exhaust piping and silencers are water-cooled, shielded or insulated	Verify / inspect configuration installed		
Exhaust incorporates a riser or other device to prevent back flooding	Verify / inspect configuration installed		
Exhaust discharge arrangement	Verify / inspect discharge is fitted with a non-return valve, flap or other permitted arrangement		

Monitors, Alarms and Shutdowns

Item	Survey checks	Y/N/NA	Surveyor Comments/ drawing / document reference
Vessel is fitted with essential monitoring instrumentation	Engine oil pressure Cooling water outlet Exhaust temp Engine gearbox oil pressure Charging rate of generator Battery meter Engine RPM Rudder position indicator		
Bilge alarms	Confirm vessel is fitted with bilge alarms (as required) audible at the bridge Verify alarm function in all compartments		
Engine alarms	Verify vessel fitted with sufficient audible or visual engine alarms Engine oil pressure Exhaust water outlet temp Other:		
Remote shutdown of main propulsion engines	Confirm design requirement Verify installation and function		
Any fuel transfer system(s) are fitted with a relief valve	Confirm design requirement Verify installation and function Retain record of compliance		
Fuel transfer system(s) shutdowns	Confirm fuel transfer system(s) have shutdowns both inside and outside the space containing the pump Verify shut down function		

Identification of Machinery Controls and Equipment

Item	Survey checks	Y/N/NA	Surveyor Comments/ drawing / document reference
Bilge Manifold labelling (for vessels > 25m)	Verify marking / labelling is complete and appropriate		
Identification of piping, valves & cocks air pipes, vents & sounding pipes	Verify marking / labelling is complete and easily identifiable by form, colour, symbol or word		

Compressed Air Systems

Item	Survey checks	Y/N/NA	Surveyor Comments/ drawing / document reference
Unfired pressure vessels design and, construction	Verify controls applied in design and manufacture and compliant with AS 1210 of Class rules		
Air compressor system relief valve	Verify air compressor has suitably sized relief valve fitted and has current test certificate Retain record of compliance		
Compressor air cooler relief valve or safety diaphragm	Verify air compressor air cooler is fitted with a relief valve or safety diaphragm		
Pressure gauge is fitted between the air compressor after cooler and discharge	Verify a pressure gauge is fitted between the air compressor after cooler and system discharge		
Pressure piping used in compressed air systems	Verify pressure piping meets the specifications of AS 4041 Retain record of compliance		

Hydraulic Systems

Item	Survey checks	Y/N/NA	Surveyor Comments/ drawing / document reference
Hydraulic pumps pressure relief protection	Verify hydraulic pumps have pressure relief fitted on the discharge side		
Hydraulic fluid specification	Verify hydraulic fluid is non-flammable or has a flashpoint $\geq 157^{\circ}\text{C}$		
Hydraulic hose specification	Verify hydraulic hoses comply with AS 3791 Retain record of compliance		
Hydraulic piping specification	Verify hydraulic pipes comply with AS 3791 Retain record of compliance		
Nylon Hydraulic tubing application	Verify Nylon hydraulic tubing is only used in hand hydraulic systems and is installed within the limitations of the standard		

Inboard Low Flashpoint Engine Installations

Item	Survey checks	Y/N/NA	Surveyor Comments/ drawing / document reference
Additional requirements for inboard engines operating on fuel having a flashpoint less than 60°C	Verify engine installation meets additional requirement for inboard engines operating on low flashpoint fuels (NSCV C5A 2.14.3)		

Refrigeration Systems

Item	Survey checks	Y/N/NA	Surveyor Comments/ drawing / document reference
Refrigeration system design and construction	Verify refrigeration systems are designed, constructed and tested in accordance with AS/NZS 16771 & 16772 Retain record of compliance		
Refrigeration machinery space ventilation	Verify spaces containing refrigeration machinery are ventilated to the outside air		
Refrigerated spaces alarm arrangement and test	Verify refrigerated spaces are fitted with an alarm that can only be activated and cancelled from within the space and that is audible from outside the space Witness alarm function test		
Refrigerated space exit light and alarm in the event of power failure	Verify refrigerated space has means to locate exit and alarm in the event of power failure Witness exit light and alarm function test in dead ship scenario		
Refrigerated spaces door configuration	Verify doors to refrigerated spaces can be operated from both inside and outside the space Witness door emergency exit from inside space function test		

Design approval compliance

Item	Survey checks	Y/N/NA	Surveyor Comments/ drawing / document reference
In accordance with approved plans	The vessel's engineering systems are constructed in accordance with the approved plans and design documentation.		

Surveyor's declaration

I declare that:

- I have conducted survey(s) as indicated, of the above mentioned vessel, in accordance with the applicable standards as set out in Marine Order 503 Certificates of Survey, and that to the extent evident from the inspection/s carried out I am satisfied that the vessel meets the standards.
- I consent to the Australian Maritime Safety Authority using and disclosing the information provided in this form for purposes associated with the administration of the Marine Safety (Domestic Commercial Vessel) National Law Act 2012.
- I understand and acknowledge that the Australian Maritime Safety Authority, as the National Regulator, may ask that I provide any information or document that the National Regulator reasonably considers necessary in relation to this recommendation.

Signature of surveyor

Date