Australian Government
Australian Maritime Safety Authority

ELV ELECTRICAL INITIAL 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 or licensed electrical contractors to monitor and record the initial electrical – Extra Low Voltage survey for a Domestic Commercial Vessel. It is a minimum set of information expected by the National Regulator, it is not intended to be an exhaustive list.

Vessel Details

Vessel name

Unique identifier

Name of surveyor

Result - In order (✓) / Not In order (✕) / Not Applicable (NA)

General

Item	Survey checks	✓/✕/NA	Surveyor Comments/ drawing / document reference
Electrical drawing/s	Where required by SAGM, verify an approved wiring diagram signed by a person holding surveyor category (a) – electrical is provided		
Circuits	Verify that circuits are correctly installed per approved wiring diagram Verify that circuits and conductors are correctly and marked as per approved drawings		
Cables condition	Verify there is no evidence of overheating, burning or cracking.		
Cable manufacturer, type and temperature rating	Identify and record details of wiring		
Cable securing and support	Verify cable/wiring and electrical equipment is adequately supported and secured.		
Penetration of bulkheads or decks	Verify cable penetrations are effectively protected from mechanical damage. Verify watertight & fire rated bulkhead or deck penetrations maintain integrity		
Mechanical protection for cables	Verify cables have appropriate mechanical protection for cables the environment in which they are installed.		
Damage - electrical fittings, fixtures and appliances	Verify electrical fittings, fixtures and appliances exhibit no mechanical damage and there is no evidence of overheating.		
Specification and arrangement - electrical fittings, fixtures and appliances	Verify electrical fittings, fixtures and appliances are appropriately IP rated , secured, protected from damage and fit for purpose		

Operational Tests (Require systems knowledge)

Item	Survey checks	✓/✕/NA	Surveyor Comments/ drawing / document reference
Generator function check	Voltage regulator operation is responding correctly to instantaneous loading and unloading of generator. In accordance with manufacturer's instructions.		
Engine monitoring	Verify main engine safety alarms and trips are functioning correctly and at the required alarm or trip setting.		Record details/settings:
Machinery remote controls	Verify machinery and equipment that incorporates remote controls, remote stops and limit switches can be operated /shutdown at both local and remote stations.		
Hydrocarbon / gas detection	Verify where fitted, hydrocarbon and LPG vapour monitoring and associated alarm systems are correctly positioned and function.		

Switchboard/Panel

Item	Survey checks	✓/✕/NA	Surveyor Comments/ drawing / document reference
Switchboard insulation	Verify switchboard and electrical equipment conductor insulation is not deteriorated or damaged.		
MCBs, fuses and switches	MCBs, fuses and switches are not exhibiting signs of arcing overheating or tracking or mechanical damage.		
Labelling of switches and protective devices	Verify switches and protective devices are clearly labelled and correctly identify the circuit they control or protect.		
Switchboard arrangement	Verify the switchboard is constructed and installed in such a manner that, in the event of fire, the spread of fire will be kept to a minimum.		
Conductor termination	Verify conductors are securely held in terminals or fittings and are not subject to tension at the terminations.		

Earthing and Equipotential Bonding

Item	Survey checks	✓/✕/NA	Surveyor Comments/ drawing / document reference
Conductor termination	Earthing connections are mechanically sound and fixed by a secure system.		
Earth connections	Earthing and bonding connections are protected against mechanical damage, corrosion and vibration.		

Batteries

Item	Survey checks	✓/✕/NA	Surveyor Comments/ drawing / document reference
Battery location, storage and arrangement	Verify battery installations are: a) mounted and arranged to prevent movement of the battery b) lead acid and alkaline batteries are not housed in the same compartment or container, or in close vicinity to each other c) not housed in accommodation spaces unless they are in a container sealed from the accommodation space and vented to the open deck d) not installed directly above or below a fuel tank or fuel filter, or any other metallic component of the fuel system. e) area within 300 mm above the battery top is electrically insulated f) terminals are covered to prevent accidental contact or shorting across the terminals g) located as close as practicable to engines to minimise voltage drop whilst minimising the risk of hydrogen released by the battery being ignited by a spark from the starter motor h) contained in a suitably sized box of chemically resistant material, capable of containing the whole volume of electrolyte with fitted lid or a dedicated, compliant battery compartment		
Battery location and mounting	Verify batteries, or sets of batteries, charged by chargers where the sum of all chargers is greater than 2 kW in total are housed in a compartment dedicated to batteries only. Cable entries to battery compartments shall be gas tight.		
Battery ventilation data	Record the type of ventilation utilised- Natural or Mechanical, and the dimensions of vent opening or fan flow rate.		
Lithium ion battery installations	Verify lithium ion battery installation complies with the AS/NZS3004.2		
Battery regulation, overcharge protection	Verify regulation measures have been provide commensurate with the capacity of the battery an and/or manufactures recommendations; Verify battery installation is protected against overcharge, over voltage and reversal of charging current; Verify charge rate indication; and Verify circuit isolation and protection		

Item	Survey checks	✓/✕/NA	Surveyor Comments/ drawing / document reference
Battery isolation	Verify switches and other circuit interrupting devices are not housed in battery boxes, battery compartments, or dedicated battery rooms. These devices shall be mounted as close as practicable, but external to, these housings. Verify all batteries can be controlled by an isolation switch operating in all active conductors. Verify isolation switches are located as close as practicable to the battery.		
Battery – isolator cabling	Verify cables between the battery and isolating switch are double insulated or installed in a wiring enclosure throughout their entire length.		
Battery paralleling	Verify systems involving multiple battery installations are provided with switching to allow the paralleling and/or changeover of batteries used for engine starting. Where such arrangements are provided the isolation capability and over current protection for each battery shall be maintained.		
Battery charger location	Verify battery chargers or inverter/chargers are not installed above a battery bank or below fuel system components.		
Battery overcurrent protection	Verify battery overcurrent protection complies with NSCV. Engine start batteries shall have either a) Short circuit protection; or b: Mechanical protection of starting cables. b) All other battery circuits, short circuit and overload protection shall be provided.		Record details:
Battery overcurrent protection	Short circuit and overload protection shall comply with manufacturer's specifications. If manufacturers information on prospective short circuit currents and fault current capacity is not available, for the purposes of providing protective devices the prospective fault currents at the terminals shall be considered to be: a) For vented cells- 20 times the nominal battery capacity at the 3 hour rate; and b) For sealed cells- 35 times the nominal battery capacity at the 3 hour rate.		Record details/settings:

Emergency Electrical Installations

Item	Survey checks	✓/✕/NA	Surveyor Comments/ drawing / document reference
Emergency supply location	Location of the Emergency supply conforms to NSCV.		
Equipment / systems supplied by emergency supply	Verify equipment required to be supplied with emergency power is compliant with NSCV.		
Emergency supply switchboard	Verify where the emergency source of electrical power is a battery, the emergency switchboard is not installed in the same place as the battery.		
Emergency supply capacity	Verify capacity of emergency power supply is compliant with NSCV. Record of testing to be kept with vessel documentation.		Record Amp-Hours (Ensures if battery replaced and system identical as original, correct size battery reinstalled)
Emergency lighting	Verify emergency lighting is complaint with NSCV. Record locations of emergency lighting in vessel documentation.		

Additional tests carried out

Item	Survey checks	✓/✕/NA	Surveyor Comments/ drawing / document reference

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 or licenced person

Date