Maritime & Coastguard Agency

MARINE GUIDANCE NOTE

MGN 720 (M+F): Innovative Prototype Vessel Trials Areas

Notice to all Shipowners, ship operators, ship managers, ship masters, ship designers, ship builders, harbour authorities, recognised organisations and certifying authorities.

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1. Summary

This Marine Guidance Note (MGN) provides guidance on the approval, certification and operation of innovative prototype vessel trials within trials areas in UK waters. It establishes a framework for controlled trials of vessels and technologies that may not fully align with existing statutory certification arrangements but demonstrate an appropriate level of safety through alternative means.

This guidance:

- Establishes eligibility criteria for prototype vessel trials;
- Identifies application and entry requirements;
- Outlines the MCA approval process;
- Describes certification arrangements applicable to prototype trials;
- Identifies approved trial areas;
- Supports innovation whilst maintaining safety, environmental protection and navigational safety standards.

2. Introduction/background

2.1 The Maritime and Coastguard Agency (MCA) recognises the increasing development of innovative maritime technologies and supports innovation through a proportionate, risk-based regulatory approach while ensuring that public safety, marine environmental protection and navigational safety are not compromised.

2.2 Some innovative technologies will require testing at sea to validate design assumptions and demonstrate safe operation prior to wider commercial deployment.

3. Innovative Prototype Vessel Trials - Eligibility

3.1 Definitions for use within the Innovative Prototype Vessel Trials (IPVT) framework only:

'**Owner/operator**' means the vessel owner, managing agent or person deemed to be ultimately accountable for the safety of the trials.

'**Trial Area**' means a body of water identified in the gov.uk page linked to MGN 720, designated for the purpose of conducting operational testing of vessels using innovative technologies.

'**Innovative Technology**' is either a new technology or a technology being re-purposed for a new function, where the associated risks to safety, environment and/or security may not be suitably addressed by current regulations, codes or good practice. The application of this framework shall be limited to vessels characterised by their use of innovative technology to operate a vessel or specific functions and systems within a vessel.

'Prototype Vessel' means the vessel with prototype innovative technologies to be subject to testing at sea and requiring certification using this framework.

'**Support Vessel**' means an appropriately certificated vessel to the applicable UK standards and regulations, directly involved in the trial of the prototype vessel, as required to ensure safety of operations and/or to respond in an emergency.

'**Test**' **or** '**Trial**' means an experiment or series of experiments, conducted over a limited period, in order to evaluate alternative methods of performing specific functions or satisfying regulatory requirements prescribed by various Merchant Shipping legislation, which would provide at least the same degree of safety, security and protection of the environment as provided by that legislation.

'**Alternative Fuels'** means a non-conventional energy sources and fuels used to replace traditional petroleum-based marine fuels (such as Heavy Fuel Oil, Marine Gas Oil, and Marine Diesel Oil) to reduce greenhouse gas and pollutant emissions. Including, but not limited to, hydrogen, ammonia, methanol, biofuels, synthetic fuels, fuel cells, and hybrid propulsion arrangements.

3.2 A vessel may be considered eligible for entry into the Innovative Prototype Vessel Trials framework where it:

- Is a United Kingdom ship
- Is less than 24m length overall
- Uses prototype innovative technologies or alternative fuels (as defined above)
- Does not operate in ground effect, on an air cushion or beneath the surface of any waters
- Does not carry more than 12 persons on board, including crew
- Does not carry any dangerous goods as cargo

3.3 For the purposes of this MGN, a vessel shall be considered a United Kingdom ship for participation in the Innovative Trial Areas where:

1. The ship is registered in the United Kingdom Ship Register; or

2. The vessel is wholly owned by a UK-established entity; or

3. The vessel is operated or managed by a UK-established entity.

For vessels qualifying under (point 2) or (point 3), the vessel must not be registered under the law of another State and must be participating in an MCA-authorised trial for a period not exceeding six months. Vessels registered on the UK Defence register are excluded.

3.4 The following are examples of systems that could apply under the IPVT framework:

- Autonomous vessels;
- Remotely operated vessels;
- Vessels using alternative fuels (As defined in 3.1);
- Vessels employing innovative propulsion arrangements;
- Vessels utilising innovative control systems;
- Vessels employing advanced sensor or navigation technologies.

3.5 The following are not eligible under this framework:

- Operate as a passenger vessel during the trial;
- Carriage of dangerous goods;
- Nuclear systems;
- Operations outside approved trial areas.

3.6 Any persons boarding the prototype vessel must hold the following valid qualifications:

- STCW Personal Survival Techniques
- Appropriate Medical Certification

In addition any persons assigned as crew to the prototype vessel must hold the following valid qualifications:

- Appropriate STCW Qualifications and Medical Certification

4. Trials Areas

4.1 There are two types of trials areas covered by this Marine Guidance Notice:

- Confined Trials Zones (CTZ)
- Extended Trials Zones (ETZ)

4.2 CTZ are areas that are covered by a Statutory Harbour Authorities (SHA) and require their agreement to operate within the governed water spaces that are outside categorised waters as per MSN 1837 as amended.

4.3 Trials inside categorised waters are not covered by this framework and are instead subject to the agreement to the relevant authority with jurisdiction over those waters.

4.4 ETZ are sea zones outside SHA areas. To operate in an ETZ an owner/operator must have undertaken trials of their vessel in categorised waters or a CTZ.

4.5 The available CTZ and ETZ can be found on Gov.uk linked to this MGN.

4.6 Any SHA that would like to engage in the IPVT, should contact the UK Maritime Innovation Hub (UKMIH) at innovation@mcga.gov.uk in the first instance.

4.7 Any SHA needs to have considered and provide evidence of the following to MCA Survey Operations HQSurvey@mcga.gov.uk for review. On completion of the review the SHA Trials areas will be included in the CTZ Annexes to this MGN:

- Local Notice to Mariners
- Risk Assessments relating to IPVT operation updated/produced
- Consider the need for using powers of direction to be issued depending on SHA powers under the Harbours Act
- Marine Safety Management System and Policy
    - Areas of Operation
    - General measures
    - SHA register of vessels
    - What is allowed to trial in your water space e.g. alternative fuels, MASS etc
    - Support vessel use/requirements
    - Contact details
    - Management of other water users that could be impacted by the trials areas
    - Emergency response
    - Any additional safety measures that are required for your area, as determined by your risk assessments

4.7 On receipt of the above information, MCA Survey Operations will review and if accepted, the list of authorised IPVT Trials areas on the Gov.uk page will be updated. *Hyperlink to gov page with the list of areas.*

4.8 The authority that covers the ETZ or CTZ cannot be held responsible for any delays in undertaking trials, due to unavailability of the trial's areas.

4.9 Should delays arise with undertaking trials due to the unavailability of trials areas, these should be reported to MCA Survey Operations. A decision will be taken on a case-by-case basis as to whether the trials certification can be extended, for reasons outside the operators/owners control.

5. Innovative Prototype Vessel Trials – Survey Process

5.1 Applicants must demonstrate that the proposed trial can be conducted safely in the confined or extended trial area of their choosing. This process cannot be used for commercial operations, and long-term certification pathways must be considered alongside applications under the IPVT process.

5.2 The owners/operators are responsible for presenting a safety case that justifies identified hazards have been assessed and are As Low As Reasonably Practicable (ALARP).

5.3 The following documentation as a minimum shall be submitted, as part of the trials safety case:

- Completed initial application form;
- Design description;
- Concept of Operations (ConOps);
- System architecture;
- Risk assessment;
- Hazard identification and risk analysis (HIRA);
- Emergency response arrangements;
- Operating limitations;
- Maintenance arrangements;
- Support vessel arrangements;
- Compliance with any SHA requirements for the requested trials area

5.4 Where remote/autonomous operations are proposed, applicants shall provide details of:

- Remote operating facilities;
- Manning arrangements;
- Communication systems;
- Cyber security controls;
- Loss of communication contingencies.

5.5 The MCA may require additional evidence to the above where an innovative technology presents risks not adequately addressed within submitted documentation.

5.6 Owners/Operators are required to contact the UK Maritime Innovation Hub (UKMIH) in the first instance to discuss their innovation project to ensure the IPVT process meets their needs.

5.7 On completion of the initial meeting with the UKMIH, owners/operators are to submit their initial application form (MSF 5630) to their local marine office and cc in innovation@mcga.gov.uk with an MSF5100 for the required fees in line with the fees regulations.

https://www.gov.uk/government/organisations/maritime-and-coastguard-agency/about/access-and-opening#marine-office-contact-details

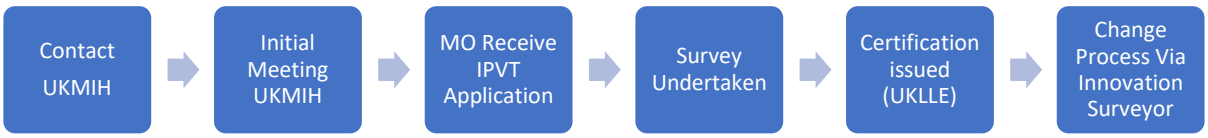
5.8 The local marine office surveyor will undertake a document review followed by a bespoke trials survey for the vessel. On satisfactory completion a UK Load Line Exemption Certificate is issued for 3 months. This certificate can be extended by a further 3 months on application to the local marine office, subject to satisfactory review and, where considered necessary further survey.

5.9 The survey will include an inspection of hull, watertight integrity, freeboard, stability and the innovative elements to ensure they are satisfactory.

5.10 Change management procedure as per Section 6 must be complied with through the certification period under this framework. All notification forms can be accessed on gov.uk.

5.11 The MCA retains the right to attend the vessel if it is determined that any of the changes made effects the certification issued or are deemed outside the agreed change process for the vessel.

5.12 Flow diagram for survey process:



6. Change Management Process

6.1 An owner/operator may be permitted to make changes to the prototype vessel, its operation or operational envelope, without invalidating any IPVT certification issued under this framework, or specific authorisation by MCA.

6.2 Any existing certificated vessel which undertakes trials under this framework in order to prove innovative technology, are recommended to contact their Certifying Authority for discussion on validity and/or reinstatement after trials completion.

6.3 To allow the vessel to make changes during the trials period without need for a further survey a change management procedure should be submitted as part of the trial's safety case.

6.4 Changes outside of the change management procedure requiring MCA authorisation will be reviewed by UK Maritime Innovation Hub (UKMIH) Surveyors. Decisions made on whether the prototype vessel requires an additional Innovative Prototype Trials Survey or can continue to operate. UKMIH will communicate their decision/required action to the owner/operator and the local Marine Office accordingly, using the innovation@mcga.gov.uk mailbox.

7. Reporting Requirements

7.1 Nothing in this framework removes the requirements for the owners/operators to make any reports as deemed necessary as per The Merchant Shipping (Accident Reporting and Investigation) Regulations 2026.

7.2 In addition to the statutory reporting requirements under The Merchant Shipping (Accident Reporting and Investigation) Regulations 2026, Owners/Operators must make the following reports under the IPVT process:

- Trials Reports

- Incident/Near Miss Reports

7.3 The trials reports are to be submitted as soon as possible after each trial or at least once at the end of each successive four-week period for trials that exceed four-weeks.

7.4 The below clarifies the application of incident and near miss in terms of this guidance only:

- An “incident” includes— any collision; any grounding; any fire; any foundering; any marine pollution; any physical injuries/loss of life; any incursion by another water user (excluding other authorised trials vessels) into a trials area in which the prototype vessel is operating; any event involving the loss of ability to command a prototype vessel when it is operating outside of a trials area, or when loss of control causes it to depart a trials area; sustained from the trial.

- A “near miss” is defined as a sequence of events and or conditions that could have resulted in an incident. An incident was only prevented only by a fortuitous break in the chain of events and/or conditions.

7.5 Reports should be submitted using the online forms provided on gov.uk

7.6 SHA are requested to share any incident or near miss reports they receive with any recommendations or lesson learnt.

7.7 SHA are requested to provide a brief monthly report to the MCA of the ongoing operation of the vessels using their trials areas. The report should include the following:

- Hours of usage
- Number of vessels using the areas simultaneously
- Interaction with other water users
- Lessons learned
- Any other relevant information

8. Operational Requirements for MASS Vessels

8.1 The following guidance on operational requirements for MASS must be fulfilled whenever prototype vessels are operated under the provisions within this framework:

- Each prototype vessel shall have a dedicated lookout, (who may also be its Master), able to control it at all times, from a location which may or may not be on board the prototype vessel. The prototype vessel lookout and Master are only permitted to control and/or be responsible for one vessel at a time (i.e. "one to many" operations are not permitted). The Master of a prototype vessel shall remain on board it, whenever it is operated in a manned mode of operation (if applicable) or if there are any persons onboard.

- Each prototype vessel shall be controlled from one location at a time, and that location must be one of the following;

    - on board the prototype vessel under control; or

    - on board a support vessel, which is not a prototype vessel, positioned within visual line of sight of the prototype vessel under control; or
    - a shore location in the United Kingdom

- Each prototype vessel control position must be capable of providing the means to perform watchkeeping from, or equivalent to, on board the prototype vessel under control

- Each prototype vessel control position must have a continuously available communications system(s) operated from or installed at the control position providing the following capabilities for the area in which the prototype vessel is operating, not the location of the control position, (if different):

    - transmitting and receiving bridge-to-bridge communications, including; communication with any other control locations for the prototype vessel(s), statutory navigation authority(ies), support vessel(s) and any other vessels in the vicinity of the prototype vessel under control
    - receiving Maritime Safety Information; and
    - transmitting and receiving distress, urgency and safety communications

- Trials must be conducted in compliance with COLREGs and prototype vessel(s) must be operated at speeds where latency does not prevent them from complying with the applicable requirements of COLREGs

9. Operational Requirements for Alternative Fuels

9.1 Any alternative fuel arrangements fitted to a prototype vessel must be designed, installed and overseen by a UK recognised classification society and provided with a declaration indicating the standards applied. The prototype vessel is not required to be classed.

9.2 The following guidance on operational requirements must be fulfilled whenever prototype vessels use alternative fuels for propulsion within this framework**:**

- Each prototype vessel shall be operated under the responsibility of a suitably qualified Master who has received documented training and familiarisation on the systems fitted.

- The Master and any personnel directly involved in operating, maintaining, monitoring, or handling the alternative fuel system shall demonstrate competency appropriate to the technology being trialled.

- Where innovative technologies are employed, additional specialist personnel shall be embarked or otherwise available as determined by the risk assessment.

- A documented risk assessment shall be completed prior to any trial operation.

- Fuel storage, distribution, and propulsion systems shall be designed, installed, and maintained to prevent uncontrolled release of fuel under both normal and foreseeable abnormal operating conditions.

- All fuel system components shall be suitable for the fuel carried, operating pressures, temperatures, and environmental conditions expected during service.

- Critical fuel system boundaries shall be capable of isolation by means of remotely operated emergency shutdown arrangements.

- Fuel tanks, battery systems, fuel cells, piping systems, pressure vessels, and associated equipment shall be subject to inspection and testing regimes appropriate to the technology employed.

- The prototype vessel shall be equipped with continuous monitoring arrangements capable of detecting identified hazards, such as fuel leaks, abnormal temperatures.

- Monitoring systems shall provide clear warnings and alarms to personnel responsible for vessel operation.

    - Safety-critical alarms shall be continuously available whenever the prototype vessel is operational.
    - Where remote monitoring is employed, essential safety information shall remain available in the event of a communications failure.

- The prototype vessel shall be fitted with emergency shutdown arrangements, as appropriate for the systems fitted.

- Emergency shutdown controls shall be accessible from locations identified within the risk assessment.

- Activation of any emergency shutdown system shall not compromise the safe evacuation of personnel or the continued safety of the prototype vessel.

- Spaces containing alternative fuel equipment shall be provided with suitable ventilation capable of preventing the accumulation of flammable, toxic, or hazardous atmospheres.

- Hazardous zones associated with fuel storage, processing, charging, bunkering, or ventilation exhausts shall be identified and documented.

- Equipment installed within hazardous zones shall be suitable for the atmosphere in which it may operate.

- Appropriate fire detection systems shall be provided within spaces containing propulsion, fuel storage, fuel handling, battery, or energy-conversion equipment.

- Firefighting arrangements, training and procedures shall be suitable for the specific hazards associated with the fuel or energy source carried.

- Fuel transfer, bunkering, charging, or energy replenishment operations shall only be conducted in accordance with documented procedures supervised by a competent person.

- Suitable emergency response procedures and equipment shall be carried and readily accessible during operations.

- Emergency services, harbour authorities, and other relevant stakeholders shall be informed of trial activities where required by the risk assessment.

- Measures shall be implemented to minimise the risk of pollution. Any release of fuel or hazardous substances shall be reported in accordance with applicable statutory requirements.

10. Operational Requirements for Joint Maritime and Aviation Trials

10.1 In addition to the requirements of this MGN, owners/operators proposing to conduct joint maritime and aviation trials should also liaise with the Civil Aviation Authority (CAA). The aviation element of the trials remain subject to CAA approval.

10.2 10.2 Contact Details: innovation@caa.co.uk

11. More information

Survey Operations
Maritime and Coastguard Agency
Bay 2/20
Spring Place
105 Commercial Road
Southampton
SO15 1EG

Email: HQSurvey@mcga.gov.uk

Website: www.gov.uk/mca

Please note that all addresses are correct at time of publishing.

Published: XXXX 2026

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Document control sheet

GOV.UK overview page – please provide the content for the GOV.UK editor to publish

Page title – (65 SHAracters only)	*MGN 720 (M+F):*
Page summary (160 SHAracters only)	.
Details	*Notice to all Shipowners, ship operators, ship managers, ship masters, ship designers and ship builders.*

Document control

Version Number	Status / Change	Date	Author / Reviewer	Content Approver	Next Review Date / Expiry Date
1.0	*First Draft*	2026	Sarah Lawlor HQ Consultant Surveyor	Approved by:	

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