Your response

Question	Your response
Question 1: Do you have any comments on our decision to update the equipment list and terms and conditions for all Ship Radio and Ship Portable licences?	Confidential? – Y / N
Question 2: Do you agree with our proposed approach to phasing out Ship Radio licence and Ship Portable Radio licence authorisations for use of legacy MOB AIS and other AMRD Group B defined devices? If not, please state your reasoning.	Confidential? – Y / N
Question 2(a): Do you have any comments on the proposed notice periods?	Confidential? – Y/N
Question 3: Do you agree with our proposal to enable the deployment of Mobile Aids to Navigation under the AIS licence?	Confidential? – Y/N
Question 4: Do you agree with our proposal to update the AIS licence to include two ASM channels? If not, please set out your reasoning.	Confidential? – Y/N
Question 5: Do you agree with our proposals to clarify the AIS licence terms and conditions? If not, please set out your reasoning.	Confidential? – Y/N

Question	Your response
Question 6: Do you agree with our proposal to authorise VDES channels (VDE-TER and VDE-SAT) for operation on vessels under the Ship Radio licence?	Confidential? – Y/N
Question 7: Do you consider there to be a near-term demand for VDES use by UK coastal stations? If so, please set out your reasoning.	Confidential? – Y/N
Question 8: If Ofcom were to enable VDES use on coastal station, do you have views on whether Ofcom should individually assign and coordinate VDES frequencies, or whether users should share VDES channels on a self-coordinated basis? Please set out your reasoning.	Confidential? – Y/N
Question 9: If Ofcom were to enable VDES use on coastal stations, do you have comments on the potential impact of wideband VDES channels on spectrum availability in congested UK waters and any steps Ofcom might need to take to manage this? Please set out your reasoning.	Confidential? – Y/N
Question 10: Do you agree with our proposal to create two additional simplex channels under the CSR (International) licence, using the lower frequency portion of channels 27 and 28? If not, please set out your reasoning.	Confidential? – Y/N
Question 11: Do you have any further views on the potential timelines for transition to digital VHF maritime radiocommunications?	Confidential? – Y/N

Question	Your response
Question 12: Do you have any alternative suggestions which may have to resolve the issue of spectrum scarcity of VHF simplex channels, licensed under the CSR (International) licence in the UK?	Confidential? – Y/N
Question 13: Do you agree with our decision to decommission the Differential Global Positioning System licence? If not, please set out your reasoning.	Confidential? – Y/N
Question 14: Do you have any comments on our general updates to the Suppliers and Demonstration terms and conditions?	Confidential? – Y/N
Question 15: Do you have any comments on the future spectrum needs associated with increased autonomy in the maritime sector, including MASS?	Confidential? –N. Please see Annex I to this document.
Question 16: Are there any other emerging technologies we should be aware of, that may drive demand for changes in UK spectrum authorisations for the maritime sector?	Confidential? – Y/N
Question 17: Are there any other reforms to the maritime spectrum licensing framework you think would be beneficial? If so, please explain.	Confidential? – Y/N
Question 18: Do you have any other comments on the proposals set out in this document?	Confidential? – Y/N

ANNEX I

Telenor Maritime response to Ofcom

Question 15 – Future spectrum needs associated with increased autonomy in the Maritime sector, including MASS

1. Introduction and scope of response

Telenor Maritime (TM) welcomes Ofcom's consultation and the opportunity to provide views on the future spectrum needs associated with increased autonomy in the maritime sector, including Maritime Autonomous Surface Ships (MASS). TM provides connectivity and communications services to maritime customers and has practical experience delivering mobile and broadband connectivity solutions that support remote monitoring and remote operations in maritime and offshore environments, including use cases relevant to autonomous and semi-autonomous vessel concepts.

TM is a **connectivity provider**, not a vessel operator, system owner, or holder of ship radio authorisations unless explicitly designated as such. Accordingly, this response focuses on **connectivity requirements, spectrum access models, and authorisation frameworks** that enable safe, reliable and scalable communications for MASS, while recognising that regulatory compliance obligations (including spectrum licensing, interference mitigation, emergency procedures and equipment shutdown responsibilities) should be assigned by Ofcom to the **ship/system owner or other clearly identified responsible entity**.

2. Changing connectivity and spectrum demand driven by autonomy

Increased autonomy fundamentally changes the maritime connectivity profile. Traditional maritime communications were optimised around voice, low-rate data, and crew-centric operational needs. By contrast, MASS concepts increasingly depend on continuous data exchange to support remote supervision, remote control, and automated decision-making.

In TM's experience, autonomy-related operations are characterised by:

- **Uplink-heavy traffic patterns**, driven by transmission of sensor data, telemetry, radar information, and video streams from vessel to shore-based systems;
- Requirements for **low latency and predictable quality of service** for command, control and safety-relevant communications;
- A need for **high availability and resilience**, typically achieved through multi-bearer architectures combining satellite connectivity, mobile/offshore IMT where available, and emerging non-terrestrial network (NTN) solutions.

These requirements point towards increasing reliance on **broadband connectivity technologies**, many of which sit outside the traditional Maritime Mobile Service framework but are nevertheless becoming essential enablers for autonomous maritime operations.

3. Relationship with existing maritime bands (VHF / MF / HF)

TM expects that MASS will rely primarily on broadband connectivity for operational needs rather than traditional maritime bands. However, existing maritime bands may continue to play a **limited**

but important role as safety, interoperability or fallback mechanisms, depending on regulatory and operational requirements.

Importantly, this does **not** imply routine human voice operation over VHF on unmanned vessels. Rather, the relevance of VHF/MF/HF in a MASS context is linked to:

- potential regulatory expectations around contingency communications,
- interoperability with conventional shipping,
- and automated or system-driven safety signalling.

TM encourages Ofcom to ensure that traditional maritime bands are not burdened with requirements better served by broadband technologies, while clearly defining any residual safety or interoperability role in a way that reflects the realities of unmanned and remotely operated vessels.

4. Cross-border operational models and spectrum implications

TM considers it essential that future spectrum and authorisation frameworks explicitly account for **cross-border MASS operating models**, where:

- a vessel may operate in UK waters or under UK flag, while
- the Remote Operations Centre (ROC) and technical staff may be located in another country.

Such models are already technically feasible and operationally realistic. From a spectrum perspective, they raise important questions regarding:

- allocation of responsibility for spectrum compliance,
- mechanisms for interference mitigation and emergency response,
- and regulatory oversight where operational control is exercised from outside the UK.

TM suggests that Ofcom adopts **role- and responsibility-based authorisation principles**, ensuring that accountability remains clear and enforceable regardless of where operational control is physically located.

5. Hybrid use of public and private spectrum and relevance of SAL/LAL frameworks

Ofcom already permits hybrid use of public and private spectrum through Shared Access and Local Access licensing frameworks. MASS represents not a new regulatory principle, but a new operational context in which similar coexistence and coordination mechanisms may need to be applied to moving maritime platforms.

TM notes that Ofcom's Shared Access Licence (SAL) and Local Access Licence (LAL) frameworks demonstrate an established regulatory approach to enabling additional users to access spectrum for local wireless connectivity, subject to technical coordination and coexistence safeguards. SAL enables localised private networks in mobile bands, while LAL allows access to spectrum that is otherwise nationally licensed where it is unused at a given location. Together, these frameworks show that Ofcom already supports **layered and shared spectrum access**, provided interference risks are managed through defined authorisation conditions.

6. Rationale for 'moving private networks' at sea

Building on the logic of SAL and LAL, TM suggests that Ofcom could consider whether similar principles could be adapted for maritime autonomy use cases by recognising the concept of a **vessel-centric, moving local authorisation area**.

Such an approach would not create new spectrum rights or exclusive nationwide access. Rather, it would translate the existing concept of geographically constrained, coordinated access into a maritime context where the authorised area moves with the vessel, while remaining subject to strict boundaries and safeguards.

Figure 1. *Scope of NKOM's authorisation issued for use of LAL at ferries sailing between Horten and Moss (Norway)*

A regulator-safe implementation could include:

- authorisation limited to defined maritime areas (e.g. UK territorial waters, specified corridors or operational zones);
- conservative technical parameters (power limits, antenna characteristics, emission masks, coordination obligations);
- explicit conditions allowing Ofcom to require modification, suspension or cessation of operation in the event of coexistence issues.

While connectivity providers such as TM may enable the technical architecture and service delivery, the responsibility for compliance with these conditions should rest with the spectrum licensee, typically the ship/system owner or another designated responsible entity.

This approach aligns with the underlying principles of SAL and LAL—shared access, coordination, and efficient spectrum use—while addressing the inherent mobility of maritime platforms.

7. Adaptation of licensing assumptions for MASS

TM's views on the specific regulatory questions raised by Ofcom are as follows:

Operator competence and remote operation
Competence requirements should evolve from a model based on physical presence onboard to a **function-based model** reflecting remote and automated operations. Competence should be associated with defined roles (e.g. remote operator, system supervisor), which may be located onshore and potentially outside the UK, provided responsibilities are clearly assigned.

Identification (call sign, MMSI)
Unambiguous vessel identification remains essential. Call signs and MMSI should continue to be associated with the vessel regardless of autonomy level, ensuring continuity for safety and interoperability, including distress and safety communications.

Responsibility for interference, emergency response and shutdown
Where no person is physically onboard, accountability should clearly rest with the licensee -ship/system owner or other designated entity.

Licensing approach
TM considers that the existing Ship Radio Licence framework may require material adaptation for MASS. Ofcom may wish to consider:

- a modified Ship Radio Licence with explicit provisions for autonomous and remotely operated vessels,
- a new MASS-specific licence category designed around remote operation,
- or a hybrid approach combining vessel authorisation with additional conditions addressing private onboard networks and remote-control arrangements.

Any approach should remain technology-neutral, internationally harmonisable, and compatible with cross-border operational models.

8. Conclusion

TM considers that increased maritime autonomy will drive spectrum demand towards broadband, uplink-heavy, resilient connectivity solutions, supported by clear, role-based regulatory frameworks. The principles underpinning Ofcom's existing shared and local access regimes provide a strong foundation for addressing these needs, provided they are thoughtfully adapted to the maritime and mobile context.

TM welcomes continued engagement with Ofcom and would be pleased to contribute further operational insights as policy and regulatory approaches evolve.