INTERNATIONAL MARITIME ORGANIZATION

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SUB-COMMITTEE ON SHIP DESIGN AND CONSTRUCTION
8th session
Agenda item 14

SDC 8/14/6
23 November 2021
Original: ENGLISH
Pre-session public release: ☒

REVIEW OF THE GUIDELINES FOR THE REDUCTION OF UNDERWATER NOISE (MEPC.1/CIRC.833) AND IDENTIFICATION OF NEXT STEPS

Comments on documents SDC 8/14 and SDC 8/14/1

Submitted by FOEI, WWF, IFAW, Pacific Environment and CSC

SUMMARY

Executive summary:	SDC 8/14/1 proposes an approach for reviewing the 2014 *Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life* (MEPC.1/Circ.833) to increase awareness and address identified areas of improvement. This document expresses general support and suggests additional elements for the proposed approach while emphasizing the need for a programme of action to further prevent and reduce underwater radiated noise from shipping.
Strategic direction, if applicable:	1,2, and 3
Output:	To be confirmed
Action to be taken:	Paragraph 20
Related documents:	MEPC 75/14, annex 2; MEPC 76/15; SDC 8/14 and SDC 8/14/1

Introduction

1 This document is submitted in accordance with the provisions of paragraph 6.12.5 of the *Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* MSC-MEPC.1/Circ.5/Rev.2) and in line with the advice provided in Circular Letter No.3985/Rev.1.

2 This document endorses, with important additional considerations, the stepwise process articulated in document SDC 8/14/1, submitted by Canada, New Zealand, the United Kingdom and the United States. It recommends that the Sub-Committee consider including numerical targets to assist designers, ship builders and operators in setting goals for underwater radiated noise (URN) reduction. The document also recommends that the Sub-Committee consider the co-benefits and trade-offs, where they exist, between URN reduction and other IMO work, including, but not limited to, energy efficiency improvements, anti-fouling systems and requirements of the Polar Code.

Background and urgent need for action

3 Recognizing the threat posed by URN from ships, IMO adopted the 2014 Guidelines, which provide general advice on the reduction of URN to designers, shipbuilders and ship operators. In 2019, two separate surveys (a study conducted by Environics Research and the World Maritime University and a Technical Workshop held at IMO) concluded that the 2014 Guidelines have not been successful in driving reductions in ship-based URN to adequately protect marine life. Both surveys also identified barriers to uptake of the Guidelines, mainly being the non-regulatory, voluntary nature of the Guidelines.

4 The lack of effective implementation of the Guidelines is of significant concern as measurements of underwater noise from shipping demonstrate that shipping noise continues to grow at alarming rates. The European Maritime Transport Environmental Report 2021 estimated that total URN energy in the waters of the European Union doubled between 2014 and 2019.[1] Furthermore, the Protection of the Arctic Marine Environment Working Group of the Arctic Council (PAME) reported that the Arctic is a special case for underwater noise because of its unique sound propagation and that parts of the Arctic Ocean experienced a doubling in the amount of underwater shipping noise between 2013 and 2019.[2]

5 Meanwhile, the collective knowledge base on how to reduce URN from shipping has grown significantly since adoption of the 2014 Guidelines. Numerous research efforts, workshops and initiatives have identified and confirmed, through modelling, pilot projects and trials, a range of technological and operational measures that can effectively reduce URN (see SDC 8/14/2 and MEPC 75/14/2 for a review of such efforts).

6 The scientific community has expressed an unequivocal call for action to reduce URN, publishing in the prominent journal *Science* that "strong" and "clear" evidence exists that noise negatively affects marine animals and that such evidence "encourages national and international policies to become more ambitious in regulating and deploying existing technological solutions to mitigate marine noise and improve the human stewardship of ocean soundscapes to maintain a healthy ocean."[3]

7 Joining the scientific community, the international community has called for urgent attention to reduce underwater noise. In 2021, the IUCN World Conservation Congress passed a resolution urging immediate action to regulate and reduce anthropogenic underwater noise. This is in addition to other actions by the international community since the adoption of the 2014 Guidelines, which are detailed in document MEPC 74/14.[4]

8 The SDC, through its review of the 2014 Guidelines, and identification of next steps to further prevent and reduce URN, is poised to play a critical role in driving innovation and transformation in the shipping industry to achieve a quieter ocean for marine life. The Sub-Committee is encouraged to prioritize and respond to the Terms of Reference contained in document SDC 8/14 with urgency.

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1 European Maritime Transport Environmental Report 2021. European Environment Agency and European Maritime Safety Agency. Luxembourg: Publications Office of the European Union, 2021. doi:10.2800/3525.

2 Underwater Noise Pollution from Shipping in the Arctic, Protection of the Arctic Marine Environment Working Group (PAME), May 2021. https://www.pame.is/projects/arctic-marine-shipping/underwater-noise-in-the-arctic

3 Duarte, C.M. et al. (2021). The soundscape of the Anthropocene ocean. *Science, 371(6529).*

4 IUCN World Conservation Congress. Resolution 024 - Restoring a peaceful and quiet ocean, Sept 2021. https://www.iucncongress2020.org/motion/024

Comments on SDC 8/14/1

9 Canada, New Zealand, the United Kingdom and the United States submitted document SDC 8/14/1 to support the Sub-Committee in the review of the 2014 Guidelines. This submission acknowledges the lack of progress under the existing Guidelines and notes that the review alone will not address all barriers to greater uptake of the Guidelines. A proposal for a programme of action and next steps to further prevent and reduce URN will be pursued following the review, as per the Terms of Reference adopted by MEPC.

10 The co-sponsors of this document agree that a review and update of the Guidelines to improve their uptake by designers, ship builders and operators are necessary, but is only an initial step. The programme of action is critical to effectively respond to the urgent calls for action from scientists, the international community and civil society to successfully reduce ship-based URN. Hence, while undertaking the review, the Sub-Committee should also identify solutions, including regulations, that will overcome the barriers to uptake of the 2014 Guidelines, as identified by the two 2019 surveys, as part of the programme of action to further prevent and reduce URN.

11 Document SDC 8/14/1 also proposes a stepwise framework approach to revising the 2014 Guidelines that: (1) focuses on the URN reduction of the ship itself (to be built or existing) as a noise source, (2) guides shipowners/designers through an iterative process to effectively reduce URN, (3) offers insight into possible co-benefits such as reduction of onboard noise and improvements in energy efficiency and (4) seeks to create guidelines with longstanding validity. Importantly, document SDC 8/14/1 also emphasizes the usefulness of setting goals to drive meaningful reductions in ship URN.

12 The co-sponsors of this document endorse this framework approach. The approach embodies underwater noise management planning, which is well-aligned with other management planning approaches of the Organization (e.g. energy efficiency management plans) and provides an opportunity for designers, shipowners and operators to consider how technology, operational measures and heightened maintenance can work together to lower URN, regardless of whether the ship is existing or a newbuilding. The approach can also foster analysis of co-benefits and trade-offs with other guidelines or regulations that have a nexus with URN reduction, such as energy efficiency, biofouling and Polar Code ship design standards and operational requirements.

13 The co-sponsors wish to offer additional points for consideration to the proposed framework revisions offered by document SDC 8/14/1. First, with regard to the new proposed section 7 "Underwater noise management planning", the Sub-Committee should consider devising numerical targets or thresholds for predictable or measurable variables characterizing URN to guide the setting of goals for ships. The targets could be specific to vessel class and whether the ship is current or a newbuilding. Setting numerical targets will provide ship designers and owners with clarity around what meaningful goals for URN should be and can better inform cost-benefit analyses.

14 Second, section 9 "Energy efficiency and URN reduction" should be expanded to discuss the technical and operational measures used to meet a range of IMO priorities, including, but not limited to, energy efficiency, biofouling, polar ship design standards and whether these measures are advantageous or not to URN reduction. This would support designers, shipowners and operators with information on how to optimize URN reduction while achieving other important or necessary objectives. This section could also identify a process for information sharing of results and lessons learned from ship URN-reduction efforts to the relevant committees overseeing work items that have a nexus with URN reduction.

Alignment with other priorities

15 The Sub-Committee should consider how the work priorities of other committees and their subsidiary bodies interact with URN reduction and should evaluate how its review and proposed programme of work can operate in tandem with the objectives formulated in other committees. The co-sponsors of this document provide three examples below of ongoing IMO work priorities that have a nexus with URN reduction, with potential overlap of solutions.

Energy efficiency

16 Reducing speeds across shipping fleets is one of the most effective measures to reduce greenhouse gas emissions from international shipping and has been shown to significantly reduce URN as well. One study found a 10% speed reduction from ships globally could result in a 13% reduction in greenhouse gas emissions and a 40% reduction in URN.[5] Another study found that reducing speeds by 10 to 20% could produce 13 to 24% less CO_2, SO_X and NO_X emissions, respectively, along with a 66% reduction in URN.[6] A study of slow steaming scenarios of North Sea shipping also found that limiting the maximum speed of ships to 75% of their design speed has potential benefits for reducing underwater vessel noise as well as air emissions.[7]

17 Various energy-saving technologies can also effectively reduce URN. Broadly speaking, technologies that reduce propeller loading (e.g. wind-assisted propulsion), increase propeller cavitation inception speed (e.g. fin caps, skewed blades) and homogenize wake flow can increase efficiency and reduce URN.

Biofouling

18 Biofouling of ships can increase URN by increasing cavitation-induced noise and reducing propeller efficiency. Certain anti-fouling systems (e.g. transducers and acoustic sparkers) can increase the overall noise signature of a ship. Shipping noise itself can also increase biofouling.[8] Priority could be placed on identifying anti-fouling systems and best practices that work in tandem to address biofouling and reduce URN.

Polar Code design standards

19 Given the special case of vessel noise pollution in the Arctic Ocean, the Sub-Committee could consider design characteristics or modifications that might be especially important for ships applying for Polar Ship Certificates, as required by the Polar Code.

Action requested of the Sub-Committee

20 In light of the urgent need to take action to meaningfully address and reduce URN from commercial shipping, the co-sponsors urge the Sub-Committee to support the approach outlined in document SDC 8/14/1 and the additional elements and considerations expressed in this document and take action, as appropriate.

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5 Leaper, R. (2019). The role of slower vessel speeds in reducing greenhouse gas emissions, underwater noise and collision risk to whales. *Front. Mar. Sci.,* https://doi.org/10.3389/fmars.2019.00505.

6 The multi-issue mitigation potential of reducing ship speeds. GL Reynolds, November 2019. Report commissioned by Seas at Risk and Transport and Environment.

7 MEPC 76/INF.17.Outcome of two Belgian studies on the reduction of emissions and underwater radiated noise from shipping.

8 Jolivet, A., *et al.* 2016. Validation of trophic and anthropic underwater noise as settlement trigger in blue mussels. *Sci. Rpts.* 6: 33829.