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EXPERIENCE-BUILDING PHASE FOR THE REDUCTION OF UNDERWATER RADIATED NOISE FROM SHIPPING

An assessment of incentive schemes as a driver of URN reduction – A Canada Steamship Lines case study

Submitted by ICS, BIMCO and ASEF

SUMMARY

Executive summary:	This document includes a case study of implementation of a fleetwide Underwater Radiated Noise (URN) management plan, comparing the costs of recording underwater radiated noise, in two regions of operation, with the financial gains attributable to incentive schemes intended to reward improvements of environmental performance. Conclusion is presented of a clear financial incentive to undertake URN reduction measures. Globally, while ensuring accuracy, consistency and repeatability of URN measurements, if the availability of low-cost URN measuring technologies can be improved and the rewards from incentive schemes be sufficient to more than covering the cost of URN reduction measures, then it must surely follow that the uptake of the Revised URN Guidelines (MEPC.1/Circ.906/Rev.1) and quiet ship class notations will increase.
Strategic direction, if applicable:	1
Output:	1.16
Action to be taken:	Paragraph 29
Related documents:	MEPC 82/9/2 and MEPC.1/Circ.906/Rev.1

Introduction

1 This case study recounts the experience of Canada Steamship Lines (CSL), with respect to implementation of a fleet wide URN management plan. The costs of implementing and maintaining the URN management plan are also compared with the potential cost savings attributable to environmental incentive schemes.

Background – Canada Steamship Line

2 The roots of Canada Steamship Lines (CSL) date back to 1845, initially operating river boats on the Saint Lawrence River. Today CSL operates in North America, the Caribbean, Europe, Africa, Australia and Asia and employs 2,300 staff. Specializing in short sea shipment of dry bulk cargoes, CSL is the world's largest owner operator of self-unloading bulk carriers, owning 48 ships, and co-owning a further 49.

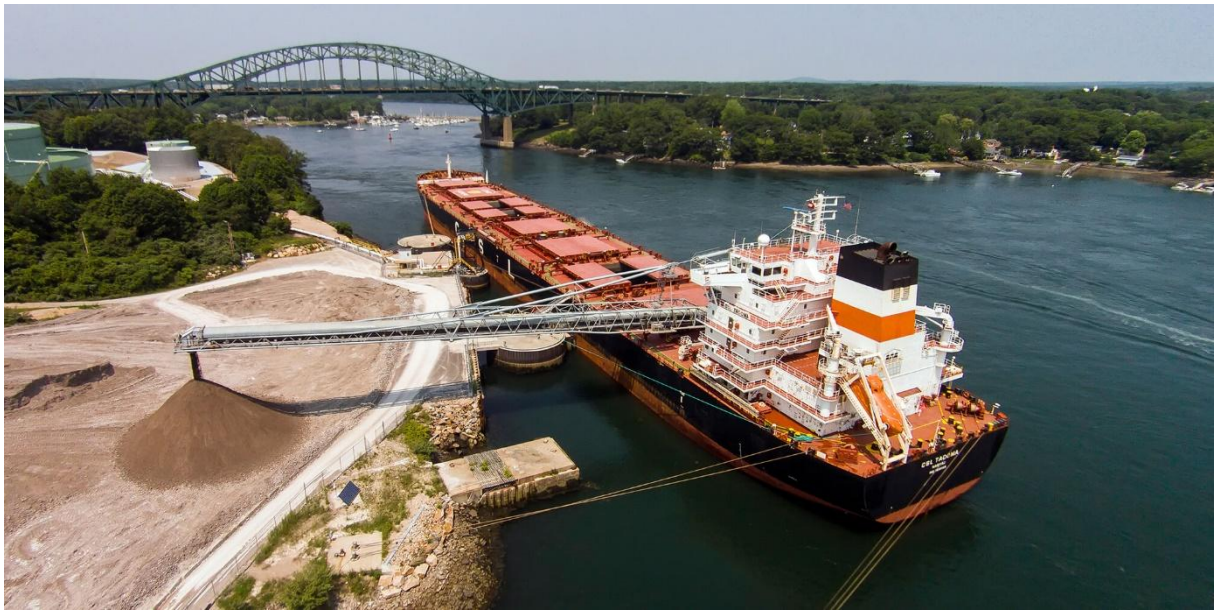

Figure 1 – Self-unloading bulk carrier CSL Tacoma

3 As part of its ESG priorities, CSL's website confirms:

"To minimize our impact on the marine environment, we actively seek ways to reduce our environmental footprint. This includes implementing measures such as preventing oil spills, reducing underwater noise from our vessels, avoiding collisions with marine mammals, and managing aquatic invasive species".

4 CSL's 2024 Corporate Sustainability Report further confirms:

"In 2024, we continued our efforts to reduce the impact of shipping on marine ecosystems. We slowed down our vessels in sensitive areas, tracked whale sightings, treated ballast water, and worked to cut underwater noise – practical actions to help protect marine mammals and their habitats."

and

"As our ships navigate through protected areas, we use onboard systems to monitor our location and adjust how we operate to comply with local regulations and reduce our impact. Our research on underwater noise is also helping scientists better understand its effects on whales and other species."

CSL's URN management plan

5 CSL has implemented a URN management plan across its fleet and a copy is attached within the annex. The key features of the plan include:

.1 the URN management plan was developed in accordance to the *Revised guidelines for the reduction of underwater radiated noise from shipping to address adverse impacts on marine life* (MEPC.1/Circ.906/Rev.1);

.2 for URN baselining, CSL's East Coast fleet uses the MARS recording station in the St Lawrence estuary, while the West coast fleet is using the ECHO-TC Program listening station near Vancouver;

.3 CSL has committed to baselining 70% of ships where URN stations are operational by 2027. To date CSL has measured 37% of its global fleet;

.4 where possible for its newbuilds, CSL will target quiet ship class notations;

.5 CSL is a partner in a project that is evaluating the co-benefit of reducing URN and GHG emissions. A number of energy saving devices have been fitted to their fleet and CSL recognizes these can play a large role in reducing URN by decreasing the propulsive power to achieve a given speed; and

.6 CSL ships' noise reduction efforts will be monitored on an annual basis and the URN management plan will be reviewed pending those results.

URN baselining by the Marine Acoustic Research Station (MARS)

6 CSL participates in the Marine Acoustic Research Station (MARS) project which records the URN signature of participating ships and simultaneously records on board noise and vibration levels. So far, measurements have been established for three CSL Trillium class Lakers, one Supramax and one coastal trading ship.

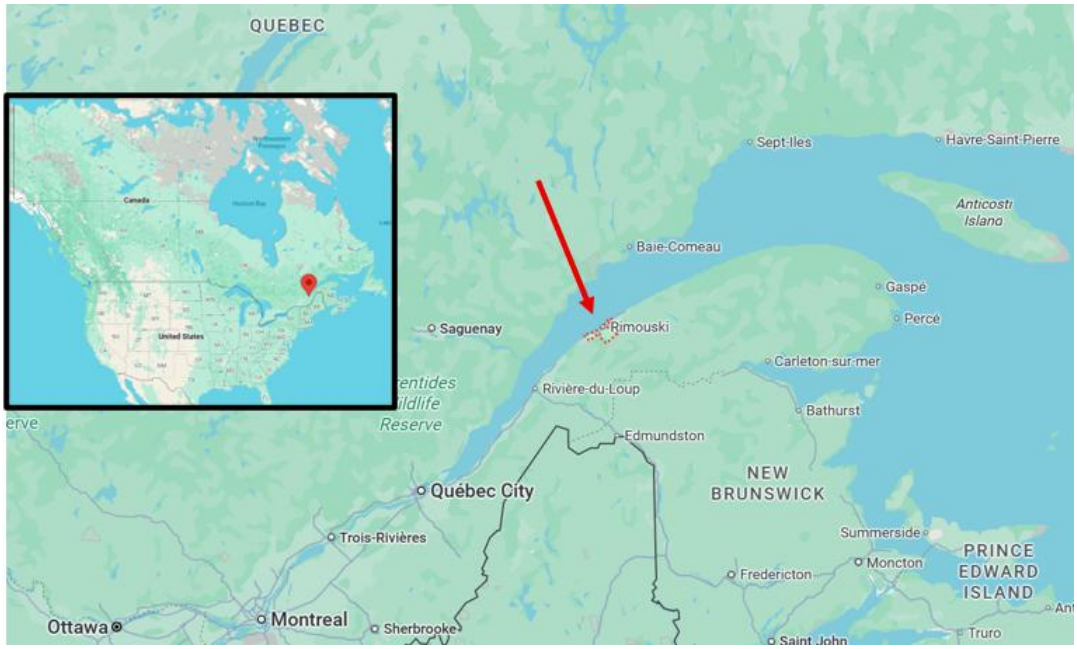

Figure 2 – Location of the MARS recording station

7 The MARS recording station was deployed in 2020 and takes measurements for six months per year. Participation in the program costs CSL CAD$15,000 per annum and allows an unlimited number of ships to be measured. Simultaneous with the URN measurements, onboard noise and vibration analyses are undertaken by the MARS engineers, and this can assist with the diagnosis of the sources of emitted URN.

8 However, in practice, the service pattern of the ships limits the number that can be measured, i.e. limits the baselining to those ships that are passing in the vicinity of the recording station during their normal operation. Therefore, on average, the approximate annual cost of each ships' measurement record is about CAD $1,875.

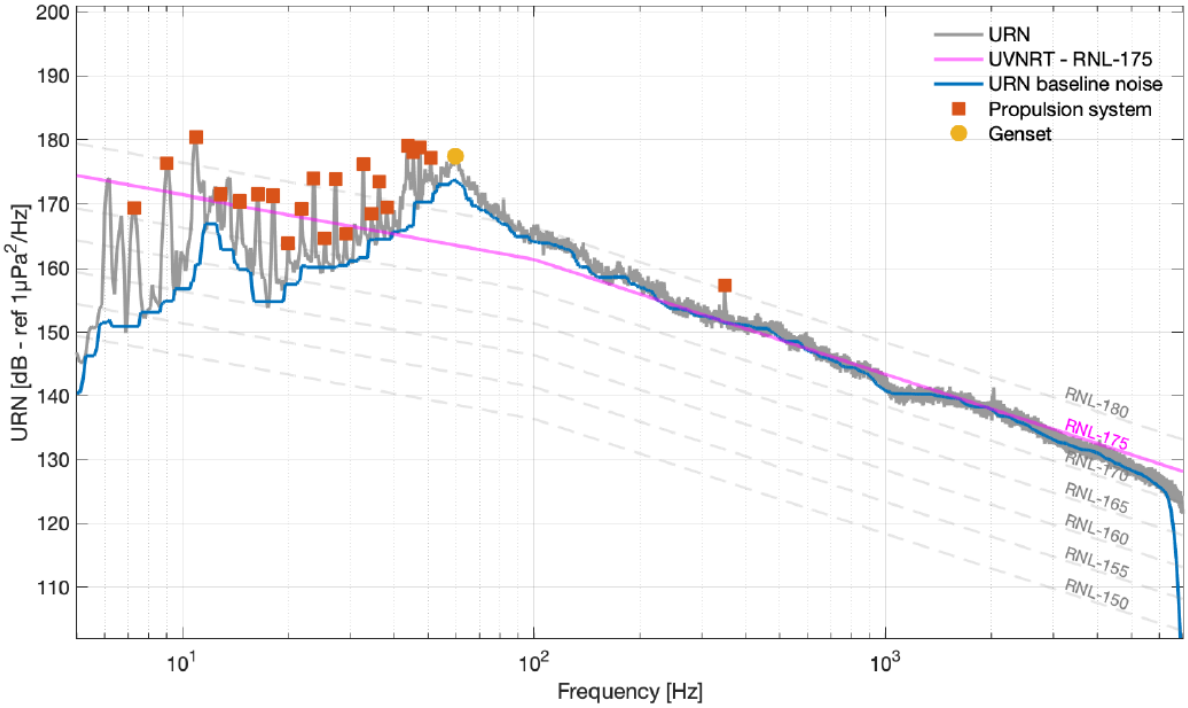

Figure 3 – A typical MARS URN measurement, with identification of principal URN sources

URN baselining at the Echo-TC Boundary Pass recording station.

9 CSL have three or four ships that trade Vancouver-Long Beach-San Marcos, and each ship averages four or five transits over the ECHO station each per year. The recording station is fully funded by Transport Canada and URN measurement reports are supplied to passing ships free of charge at the request of the ship's owner.

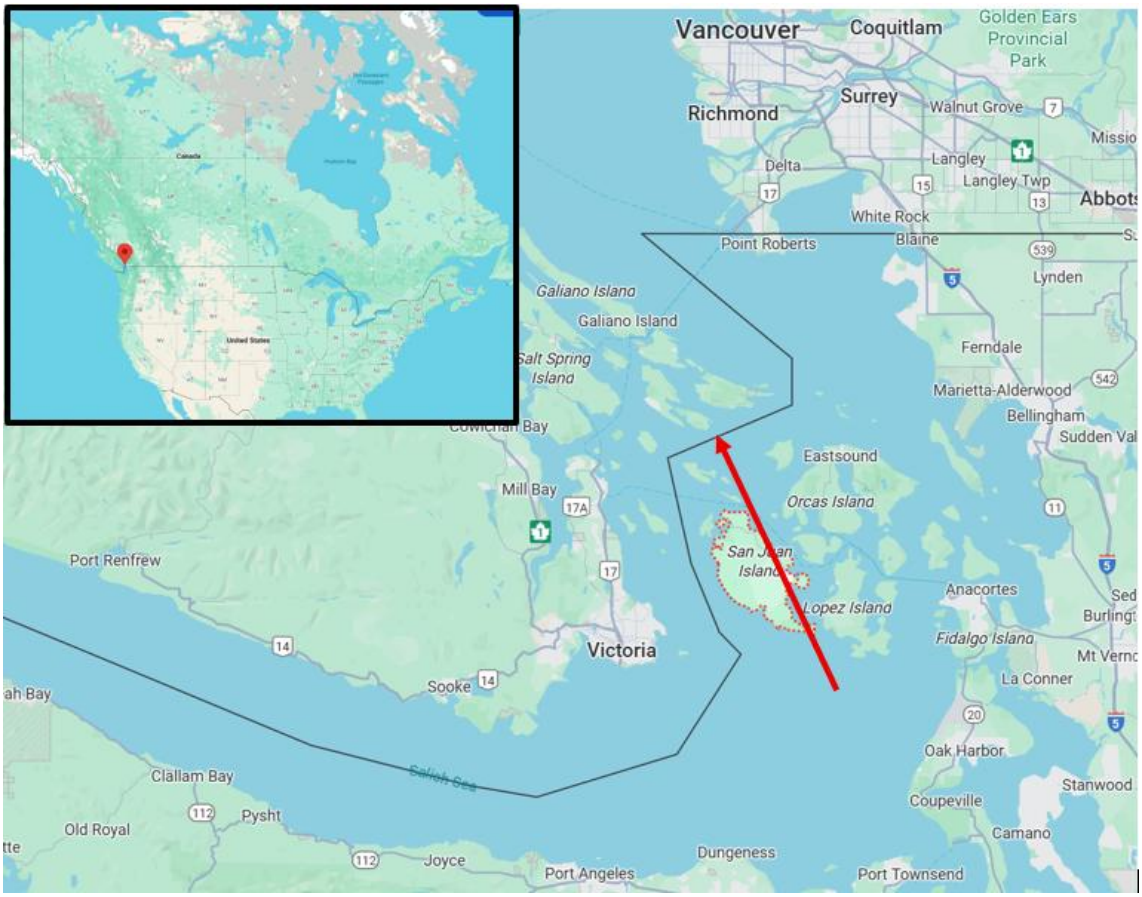

Figure 4 – Location of the Echo-TC Boundary Pass recording station

10 To date, five ships of three different sizes have been measured.

Cost of implementing the CSL URN management plan for each ship

11 Assuming that the cost of drafting the URN management plan is about CAD$8,000, which is fully revised every four years, and that it applies to all of the CSL owned vessels, then the annualized cost per vessel is just:

$$\frac{\$8{,}000}{4 \times 48} = CAD\$42$$

12 Associated with the URN management plan, if the ship improvements are limited to those measures where the co-benefit of URN reduction and energy efficiency can be achieved, then arguably the cost is attributable to GHG regulatory compliance and there is no CapEx or OpEx cost associated with the URN reduction. For example, the additional hull cleaning carried out by CSL is yielding improved efficiency, as well as URN reduction.

13 Hence, for the ships using the ECHO facility, where the URN baselining is provided free of charge, the cost of implementing the URN management plan is close to zero. For the ships using the MARS facility the cost is principally the URN measurement cost of about CAD $1,875 per ship, per annum.

Potential financial benefits of the CSL East coast fleet implementing the CSL URN management plan

14 CSL advise that none of the ships which utilize the MARS recording station qualify for URN reduction incentives from the ports served. However, the International Association of Ports and Harbours' (IAPH) Environmental Ship Index (ESI) will include URN from 2027, and noting that Montreal port is a member of the scheme, it is possible that the situation may at that time be different. To provide a financial incentive, the net gain, to which a reduction in harbour dues could contribute, would need to exceed the costs of implementing the URN management plan, i.e. for each vessel the annual savings would need to exceed the calculated CAD$1,875 indicated in paragraph 13 above.

15 The 2025 Montreal harbour fee for a Canadian flagged ship is CAD$0.0453 per Gross Ton per visit.

16 Assuming a Laker sized ship visiting Montreal port five times per year, the total harbour dues payable for a Canadian flagged ship is:

$$= 5\ visits \times 22{,}715\ GT \times \$0.0453 = \ CAD\$5{,}145$$

17 Hence, for the Canadian flagged ship to achieve a net financial benefit, the level of discount would need to exceed approximately 36% of the total annual Montreal harbour fees.

Potential financial benefits of the CSL West coast fleet implementing the CSL URN management plan

18 The ships that utilize the ECHO recording station and visit Vancouver port will accrue reductions in harbour dues if they have undertaken various URN reduction steps. The reductions are graded according to criteria assigned to the bronze to platinum levels detailed within the port's 2025 fee document. For example, by fitting the below devices, the silver rate of reduction in harbour dues may be attained:

Vessel Technologies to Reduce Underwater Noise [4] [5]	Combination of complementary technologies to reduce underwater noise	• Nakashima GPX Propeller AND Nakashima Neighbor Duct • Nakashima GPX Propeller AND Nakashima Composite Stator • Kamome Gate Rudder System (Gate Rudder and GRS Propeller) • Air Lubrication	Must provide suppliers certificate, owner/engineer attestation or other document deemed acceptable by the Port Authority.

19 The harbour dues attributable to each rate are also detailed within the port fee document as follows:

Harbour Dues Rates Per Gross Registered Tonne (GRT)

		Rate
(a)	Base rate	$0.116
(b)	Bronze rate	$0.089
(c)	Silver rate	$0.075
(d)	Gold rate	$0.062
(e)	Platinum rate	$0.029

20 Hence for a ship achieving the silver rate, a reduction in harbour dues of CAD$0.041 per GT, per visit, is attributable. Assuming, for example, a Panamax-sized ship making five port visits per year, the annual reduction would amount to:

$$= 5\ visits \times 43{,}681\ GT \times \$0.041 = CAD\$8{,}954$$

21 It should be noted that award of the silver rate is dependent on the installation of devices, or combinations of devices, that are known to both increase energy efficiency and reduce URN. Therefore, if fitted with the primary objective of GHG regulatory compliance, the capital cost of achieving the URN reduction is effectively zero, and coupled with the freely available local URN measurement facility it means that the implementation and maintenance of the URN management plan can be achieved at negligible cost, but can produce a net annual benefit to the ship owner of nearly CAD$9,000.

22 Alternatively, if the same ship was to gain a quiet ship class notation, the platinum rate of reduction could be achieved, which yields an annual reduction in harbour dues of CAD $19K. However, the cost of achieving and maintaining the notation would also need to be taken into account and for such notations typically more rigorous URN measurements would be required. For comparison, a North American ship owner has advised a typical cost of about US$50,000 = CAD$69,300 for the necessary survey fees and URN measurements to secure a quiet ship class notation, which would need to be repeated at least every five years. Hence over that five-year period, a total reduction in port dues of about CAD$95,000 would accrue, versus the measurement and survey cost of about CAD$69,300, yielding a net annual benefit to the ship owner of about CAD$5,140. However, for the URN measurements there will also be less tangible costs associated with the deployment of the ship to the trials area, and also the loss of revenue during the trials, that might give a different outcome.

Conclusions

23 The incentives put in place by the port of Vancouver, and the autonomous measurement facility funded by Canada, appear particularly well configured. Ships entering the port can regularly record their URN emissions at no cost, hence facilitating the implementation of URN management plans. The condition of ship's hulls, propellers and machinery can also vary with time. For example, propeller blades can suffer impact damage and cavitation erosion which could increase their URN emissions. Therefore, the ability to regularly check the URN emissions over extended periods of time is also beneficial. The level of reductions in port dues that are attributable to a Panamax-sized ship are clearly of sufficient magnitude to promote the uptake of URN management plans and other URN reduction measures.

24 Based on the typical cost of achieving a "quiet ship" class notation, (as supplied by another North American ship owner), it appears possible for the port of Vancouver incentive scheme to also yield a net financial benefit to the ship owner, although there may be less tangible costs attributable to the deployment of the vessel to the trials locality and loss of revenue that might give a different outcome.

25 On the East coast, it is possible that reductions in port dues alone could be of sufficient magnitude to cover the costs of the URN measurements. But providing a financial incentive for the uptake of URN reduction measures would necessitate a balancing of the noise measurement cost versus the rewards attributable to any incentive scheme.

26 It should be noted that financial gain is not the reason that some ship owners, including CSL, have already adopted URN management plans or quiet ship class notations.

Such owners consider this approach as an integral part of their environmental policies and responsibilities.

27 Nevertheless, shipping companies are commercial businesses and as such are focused on returning profit. Hence, while ensuring accuracy, consistency and repeatability of URN measurements, if the availability of low-cost URN measuring technologies can be improved and the rewards from incentive schemes be sufficient to more than cover the cost of URN reduction measures, then it must surely follow that the uptake of the Revised URN Guidelines and quiet ship class notations will increase.

28 The co-sponsors extend their sincere thanks to the Canada Steamship Line for their support in the development of this submission.

Action requested of the Sub-Committee

29 The Sub-Committee is invited to take note of the conclusions within paragraphs 23 to 28.

***

ANNEX

CSL UNDERWATER RADIATED NOISE MANAGEMENT PLAN

CSL

cslships.com

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OVERVIEW

The United Nations[1] defines pollution as “the presence of substances and/or heat in environmental media (air, water, land) whose nature, location, or quantity produces undesirable environmental effects”. Noise Pollution is typically defined as sound, which is unwanted, either because of its effects on humans, its effect on fatigue or malfunction of physical equipment, or its interference with the perception or detection of other sounds.

The United Nations Convention on the Law of the Sea[2] defines “pollution of the marine environment" as “the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities”.

We can therefore consider Underwater Radiated Noise (URN), in a similar way to air emissions or liquid discharges.

The Marine Environment Protection Committee at its eightieth session (3 to 7 July 2023) approved MEPC.1/Circ.906 Revised Guidelines for the Reduction of Underwater Radiated Noise (URN) from Shipping to Address Adverse Impacts on Marine Life. Commercial shipping is a large contributor to URN which has adverse effects on marine life. Section 5 offers guidance on URN management planning with section 5.3 stating that URN Management Planning is intended to be a flexible tool that allows a customized approach and may include establishing the baseline (predicted or actual) of a ship's URN, setting URN targets which should be specific and, where possible, quantitative, and evaluating, alone and in combination, various technological, operational and maintenance approaches to reduce URN. Where URN reduction measures have been implemented, shipowners are encouraged to evaluate the impact of these measures. This process would follow the URN Management Planning Reference Chart in the IMO Ship Design Committee (SDC) 10/5, Annex 1.

Section 5.4.1 suggesting that shipowners develop and implement an URN management plan. This Underwater Radiated Noise Management Plan (URNMP) was developed in response to

[1] United Nations Office for Disaster Risk Reduction

[2] UN General Assembly, Convention on the Law of the Sea, -, 10 December 1982, https://www.refworld.org/legal/agreements/unga/1982/en/40182 [accessed 29 July 2024], article 1(4).

that request and defines CSL's continued involvement in safeguarding the health and wellbeing of the marine ecosystems in which we navigate.

Additionally, as a founding member of Green Marine, CSL intends to continue following the Green Marine environmental certification program[3] which outlines compliance criteria with regards to URN management and other environmental issues.

To accomplish these objectives, we will continue participating in the Marine Acoustic Research Station (MARS) project[4] and the Enhancing Cetacean Habitat and Observation (ECHO) Program[5] for URN monitoring and will be following all voluntary and mandatory speed reduction regulations. CSL aims to baseline as many ships as possible in its fleet and generate a URN profile for its given deadweight. Additionally, CSL will be investigating means to reduce the URN of its ships and will repeat URN measurements, when possible, to assess URN reductions.

We believe that protecting the environment is not only our responsibility but also a crucial component of our long-term success as a business.

[2]https://green-marine.org/
[4] https://www.projet-mars.ca/en
[5] https://www.portvancouver.com/environmental-protection-at-the-port-of-vancouver/maintaining-healthy-ecosystems-throughout-our-jurisdiction/echo-program/

BASELINE URN

CSL owns, operates or has joint ventures in a fleet of 103 vessels of which 49 are fully owned by CSL. To date, CSL has baselined 37% of it's fully owned global fleet: 6 ships in the Americas fleet (2 Kamsarmax, 3 Panamax, 1 Supramax) and 14 ships in the Canada division (9 SUL Lakers, 4 Laker Bulkers and 1 Handymax).

CSL commits to baselining a minimum of 70% of ships in each category where URN stations are operational by 2027.

This section provides an overview of how CSL established URN baseline of its vessels.

ECHO PROGRAM (ONGOING)

The Vancouver Fraser Port Authority is responsible for stewardship of the lands and waters that make up the Port of Vancouver's jurisdiction in and around Vancouver, British Columbia. Recognizing that commercial marine activity in the region is increasing, and has the potential to impact at-risk whales, the port authority launched the Enhancing Cetacean Habitat and Observation (ECHO) Program in 2014 to better understand and reduce the cumulative effects of shipping on whales throughout the southern coast of British Columbia. The program is partially funded by Transport Canada.

CSL has committed to baseline it's fleet when there is the opportunity to do so and has made use ECHO-TC Program listening station at Boundary Pass. CSL has obtained URN measurements from the Boundary Pass station for 5 of its ships, representing 3 ship sizes: Kamsermax, Panamax and Supramax. CSL will continue to use the station and establish a baseline for each of these classes of ship.

MARINE ACOUSTIC RESEARCH STATION (MARS) (ONGOING)

The Institut des sciences de la mer de Rimouski, Innovation Maritime, Ministère de l'Économie, de l'Innovation et de l'Énergie along with several shipowners, including CSL, established the Marine Acoustic Research Station (MARS) in the St. Lawrence Estuary, near Rimouski, in 2020. Transport Canada provided a portion of the funding for the project. It is operational for 6 months of the year, capturing approximately 250 vessels during this period. There are two components, the URNS station (Underwater Radiated Noise Signatures) and the OBAVSI system (On-Board Acoustic and Vibratory Sources Identification). The platform allows real-time measurement and

report of the acoustic signatures of partnerships using the ANSI/ASA S12/64-2009 standard and meets ISO 17208-1.

CSL has taken URN measurements of 3 Trillium Class Lakers (2 SUL and 1 bulker), 1 Supramax, and one Coastal trading ship of Laker dimensions. CSL has additionally taken onboard measurements of these vessels and identified sources of vibration-induced noise and their level of contribution to baseline the URN of its fleet operating in this region.

CLASS MEASURED NOISE NOTATION (2022)

The CSL Nukumi had her URN measured by the shipyards URN station during the sea trials near Shanghai and as such has a Lloyds Register URN-M notation. Note that the URN station utilized did not meet ISO 17208-1 due to a shallower water depth and higher than desired level of background noise and so correction factors were applied to provide a more accurate value.

ACOUSTIC SURVEILLANCE OF SEAWAY AND SHIP SIGNATURES (2012-2013)

The Department of Fisheries and Oceans installed an acoustic observatory in the Laurentian Channel off Metis-sur-Mer from November 2012 to October 2013. The installation aimed to improve understanding of whales' acoustic environment in their habitat in the Estuary and Gulf of St. Lawrence and recordings were calculated according to ANSI 512-64-2009. CSL was able to pass the station with 10 ships although it should be noted that 2 of those ships have since been retired.

URN TARGETS

This section outlines CSL ambition with regards to setting target source-noise reductions.

CSL will target an Underwater Noise notation where possible for it’s new builds.

Further, CSL’s URN reduction approach aims to meet or better the Transport Canada’s UNVRT. Both MARS and the ECHO programs can provide evaluations on URN baseline which can be used to assess whether CSL vessels exceed Transport Canada’s UVNRT.

URN REDUCTION APPROACHES AND RELATED ACTIONS

This section outlines CSL research initiatives and other projects to advance knowledge on URN and both technical and operational approaches that CSL intent to take to address URN.

SCIENTIFIC RESEARCH AND RELATED URN PROJECTS

[2024 – Ongoing:] CSL is a partner in a project with IMAR evaluating URN Assisted Navigation where we will evaluate the co-benefit of reducing URN and GHG emissions.

[2020-Ongoing]: CSL has been a contributor to the MARS project since it's inception in 2020. To date, CSL has measured 4 of it's ships URN at the MARS station. Additionally, those 4 ships also had their source vibration measured onboard the vessel and a source noise contribution was identified for major machinery. CSL will investigate what measures can be taken to reduce these source noise emissions.

[2021-2022] Transport Canada established a working group of industry experts, of which CSL is a member, to generate Underwater Vessel Noise Reduction Targets (UVNRT) maximum values for various ship categories. by vessel type to guide URN reduction efforts.

[2019-2024] In Europe, CSL participates in the PIAQUO program[6] which aims to reduce underwater radiated noise generated by ships and adapt it in real time to the ecosystems, to minimize their impact on the environment. CSL contributed operational experience and input on the practical evaluation of URN reducing technologies.

[6] http://lifepiaquo-urn.eu/en/home/

DESIGN AND TECHNICAL NOISE REDUCTION APPROACHES

CSL will instal Propeller Boss Cap Fins (PBCF) on ships in its US and Australia fleets where possible noting that CSL's recent ships have bulbed rudders that won't accommodate PBCF's but offer similar performance. PBCF's work by eliminating hub vortexes and transferring that cavitation energy into additional thrust which reduces URN. CSL will continue to evaluate the commercial feasibility of installing PBCF's on its ships.

CSL's latest Canadian vessel, the Nukumi, has a diesel-electric propulsion system. Through the MARS program, it was identified that this configuration was significantly quieter than a conventional slow-speed 2-stroke arrangement for a similar sized vessel of Laker dimensions. A diesel-electric configuration will be a consideration for future newbuilds at CSL.

MAINTENANCE AND OPERATIONAL APPROACHES

VOLUNTARY SLOW DOWN MEASURES

Across the globe, CSL has identified areas where mandatory and voluntary slow downs are in effect in our area of operation and CSL has made a commitment to adhere to these measures. A detailed list of these areas is presented in Appendix A.

In California, CSL has received the Saphire award, the highest achievable, for travelling at 10kt or less for over 85% of vessel transits in the Vessel Speed Reduction Zone.

CSL has also participated in the ECHO Program voluntary slowdowns for 100% of transits in 2022, and 93% of transits in 2023 to reduce underwater noise for endangered southern resident killer whales off southern British Columbia.

MAINTENANCE APPROACHES

CSL recognises the quality of the propeller and hull coating can play a large role in reducing URN via decreasing the propulsive power required to achieve a given speed.

[2024-Onwards] During the CSL Spirit's dry-docking in 2024 a graphene-based coating was applied to the propeller of the CSL Spirit. The coating aims to improve propeller performance and prevent erosion, roughening and biofouling of the blade surface which would imply a reducing in required propulsive force and corresponding URN value.

[2023-Onwards] In 2023 CSL trialled a mid-season hull cleaning onboard the CSL St Laurent. The fuel reduction was considerable and as such, CSL is evaluating the impact of a routine hull cleaning program for its domestic fleet.

GREEN MARINE – UNDERWATER NOISE PERFORMANCE INDICATOR

CSL is a founding member of Green Marine. Participants of the Green Marine environmental certification program, must assess their environmental performance annually, submit to an external verification, agree to publish their individual results, and commit to a process of continual improvement. Every two years, participants must submit their results to an external verificatory accredited by Green Marine and every year participants must demonstrate improvement.

In 2023, CSL received the highest score level (Level 5) for URN management. CSL will continue to abide by the program's requirements with continuously more ambitious objectives and aim to achieve a level 5 every year. The 2024 URN Criteria are presented in Appendix B.

Further, Green Marine's Port & St Lawrence Seaway Corporations underwater noise performance indicators criteria at level 3 and above require the development of Underwater Noise Mitigation Management Plans which may include slowdowns for the protection of marine mammals. These plans should further incentivise ship owners to monitor their URN and offer a reward for their efforts. This criterion creates synergies between CSL's URNMP and ports participating in the Green Marine program.

MONITORING AND EVALUATION

CSL ships' noise reduction efforts will be monitored on an annual basis and the URNMP will be reviewed pending those results.

The Green Marine certification program requires an annual evaluation of URN activities. The MARS program generates an annual report for each vessel that it evaluates. CSL commits to soliciting the ECHO program on an annual basis for the ships captured and continues to establish a baseline for its North American West Coast ships.

CSL will publish the URN evaluation in its annual Sustainability Report.

SUMMARY OF CSL'S URN POLICY OBJECTIVES

Over the next 5 years CSL commit to undertake the following URN approaches:

- By 2027, obtain a baseline measurement for at least 70% of ships in each major category (SUL Laker, Laker, Panamax, Kamsarmax, Handy) where URN stations are operational.
- Target and Underwater Noise notation for newbuilds (where feasible).
- Evaluate options to reduce URN on existing vessels that exceed UVRNT in Canada.
- Explore commercially feasible URN reduction methods on existing ships and install as required.
- Follow voluntary and mandatory speed reduction zones as required in operating areas. Target 85% minimum compliance with voluntary slowdown measures (see Appendix A)
- Aim to achieve Level 5 in Underwater Noise Performance Indicator for Green Marine every year.
- Obtain URN measurements in all operating regions if monitoring is available and commercially feasible.
- Regularly monitor and participate in scientific evaluation of URN sources and mitigation measures as appropriate.
- Disclose URN evaluation and performance within annual Sustainability Report.
- Additional measures may be undertaken throughout this period.

APPENDIX

APPENDIX A: CSL OPERATIONAL AREAS WITH SLOWDOWNS

Region	Applicable Laws, Regulations or Programs	Regulation or Program Limit
Quebec Saint Lawrence Estuary	*Interim Order for the Protection of North Atlantic Right Whales (Eubalaena Glacialis) in the Gulf of St. Lawrence, 2024*	In certain delimited zones during summer period, speed limited to 10kts.
US East coast	*North Atlantic Right Whale Vessel Strike Reduction Rule*	Speed limited to 10 kts for vessels above 65 feet in length in designated areas. Seasonal.
Queensland, Australia	*Great Barrier Reef Marine Park Regulations 1983*	Vessels other than Prohibited Vessels must slow down to a speed of 6 kts within 150 meters of a dolphin and 300 meters of a whale when in the MPA's limits.
California, San Francisco Bay, Greater Farallones and Cordell Bank national marine sanctuaries	**Voluntary** – Vessel Speed Reduction zones	Vessels 300 gt or larger need to reduce speed to 10 kts.
USA and Canada Pacific Coast	**Voluntary** – Swiftsure bank, Haro Strait and Boundary Pass – ECHO Program Voluntary – Quiet Sound: approach to the port of Seattle and Tacoma (same speed targets as ECHO Program)	- 14.5 knots or less through the water for vehicle carriers, cruise ships and container vessels. - 11 knots or less through the water for bulkers, tankers,

		ferries and government vessels.
Port of Los Angeles/Long Beach	**Voluntary** – Vessel Speed Reduction Incentive Program	12 kts starting at the 40 nm zone from Point Fermin Light for a higher incentive and 20 nm for a lower incentive.
Port of San Diego	**Voluntary** – Vessel Speed Reduction Program	12 kts starting at the 40 nm zone from Point Loma. Cruise ships are requested to travel at 15 kts.
South Korea, Ports of Busan, Ulsan, Yeosu, Gwangyang and Incheon	**Voluntary** – *Special Act on Improvement of Air Quality in Port Areas*	12 knots for container ships and car-carriers, 10 knots for other ship types starting at 20 nm away from ports.
North-western mediterranean sea	**Voluntary - Annexe 4 of the IMO RESOLUTION MEPC.380(80) (adopted on 7 July 2023)** Associated protective measures for the north-western mediterranean sea particularly sensitive sea area	Mariners should navigate with particular caution within the NW Med PSSA, in areas where large and medium cetaceans are detected or reported and reduce their speed to between 10 and 13 knots.

APPENDIX B: GREEN MARINE URN CRITERIA FOR SHIP OWNERS

LEVEL 1
Monitoring of regulations

LEVEL 2

2.1 Conduct regular hull cleaning and propeller blade maintenance. The participant must keep a record of these actions for each vessel in their fleet.

Note: Hull cleaning and propeller maintenance should at least be done during dry dock.

2.2 Review the list of sensitive areas in Canadian and US waters to determine whether the participant's vessels transit through or have operations in such areas. Ensure that this information is communicated to each vessel.

2.3 Participate in voluntary traffic measures, like a slow-down or lateral displacement, in specific zones as identified by port or governmental authority, or regional coalition.

LEVEL 3

3.1 Actively participate in collecting and providing whale sighting data (in Canadian and US waters) through a logbook or a recognized application (such as Whale Alert and Whale Report).

Note: Sightings recorded in a logbook should be shared with a recognized central database.

3.2 Develop and adopt a Marine Mammal Management plan (MMMP) in order to reduce the potential adverse effects of vessels, especially within known sensitive marine areas, as identified in Criterion 2.2.

OR as an alternative to 3.2 for pilotage organizations:
3.3 Aboard a majority of piloted ship transits, when it is safe and operationally feasible, meet criteria 3.1 and 2.3.

LEVEL 4

4.1 Incorporate applicable vessel quieting technologies during retrofits and new vessel construction.

Note: Refer to published documents like the IMO and the SNAME MVEP Guidelines, available in the Members section of the Green Marine website. This criterion is applicable only for ship owners ordering/designing new vessels (keel laid after Jan 2018) or conducting retrofits of propulsion systems or other equipment that contributes significantly to underwater noise.

AND, fulfill one of the following 3 criteria:

4.2 Work with ports to estimate relative ship noise levels for at least one vessel in their fleet.

OR

4.3 Estimate relative ship noise levels of at least one vessel in their fleet by using a dedicated hydrophone.
Note: Collaboration with a bioacoustician is essential to obtain reliable data.

OR

4.4 Support / collaborate on scientific research on underwater noise allowing the estimation of relative ship noise levels for at least one vessel in their fleet.

LEVEL 5

5.1 Proceed to an in-depth analysis of vessel noise footprint on at least one ship in order to identify main noise sources. Solutions to be identified and implemented to reduce noise output.

Note: ANSI/ASA S12.64-2009 or ISO 17208-1:2016 underwater noise standard measurement methodology should be used where at all possible.

AND, fulfill one of the following 3 criteria:

5.2 Work with ports to estimate relative ship noise levels for 15% of the vessels in their fleet, with a minimum of 3 vessels measured.

OR

5.3 Estimate relative ship noise levels of 15% of the vessels in their fleet, with a minimum of 3 vessels measured, using a dedicated hydrophone.

Note: Collaboration with a bioacoustician is essential to obtain reliable data.

OR

5.4 Support / collaborate on scientific research on underwater noise

APPENDIX C: CSL 2023 SHIP BASELINE MEASUREMENTS

CSL Division	Ship	Ship Class	Speed Through Water (kt)	URN (dB)	Year
America's	CSL Koasek	Kamsamax	10.6	189	2023
	CSL Koasek	Kamsamax	12.6	190	2023
	CSL Koasek	Kamsamax	12.6	190	2023
	CSL Koasek	Kamsamax	9.8	183	2023
	CSL Koasek	Kamsamax	9.6	184	2023
	CSL Koasek	Kamsamax	12.2	185	2023
	CSL Koasek	Kamsamax	12.2	186	2023
	CSL Frontier	Supramax	12.1	188	2023
	CSL Frontier	Supramax	12.0	188	2023
	CSL Tecumseh	Panamax	13.3	188	2022
	CSL Tecumseh	Panamax	11.0	188	2022
	CSL Kajika	Kamsamax	11.7	186	2021
	CSL Koasek	Kamsamax	11.2	180	2021
	CSL Koasek	Kamsamax	11.9	181	2021
	CSL Sprit	Panamax	13.4	194	2021
	CSL Sheila Ann	Panamax	10.8	186	2021
	CSL Sheila Ann	Panamax	11.5	193	2021
	CSL Sheila Ann	Panamax	14.0	190	2021

	CSL Sheila Ann	Panamax	11.7	195	2021
	CSL Sheila Ann	Panamax	13.1	189	2021
	CSL Sheila Ann	Panamax	13.5	192	2021
	CSL Sheila Ann	Panamax	13.3	187	2021
	CSL Frontier	Supramax	14.0	189	2020
	CSL Frontier	Supramax	13.2	192	2020

CSL Division	Ship	Ship Class	Speed Through Water (kt)	URN (dB)	Year
Canada	CSL Ferbec	Handymax	12.8	180	2023
	CSL Baie St. Paul	SUL Laker	11.9	180	2023
	CSL Nukumi	SUL Bulker	11.3	179	2023
	CSL Welland	Bulker Laker	9.7	195	2021
	CSL Thunder Bay	SUL Laker	12.6	180	2023
	CSL Atlantic Huron	SUL Laker	14.5	195	2013
	CSL Laurentien	SUL Laker	12.6	194	2013
	CSL Niagara	SUL Laker	11.1	190	2013
	CSL Tadoussac	SUL Laker	11.6	200	2013
	CSL Oakglen	Bulker Laker	13.4	200	2013
	CSL Rt Hon Paul J Martin	SUL Laker	12.4	194	2013
	CSL Spruceglen	Bulker Laker	10.9	198	2013
	CSL Salarium (retired)	SUL Laker	14.5	195	2013
	CSL Pineglen (retired)	Bulker Laker	12.9	193	2013


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