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INFORMATION

From: To:	General Secretariat of the Council Working Party on Shipping
Subject:	Preparation of IMO/SDC 12 (London, 19 - 23 January 2026) – Draft submission by the Netherlands – REVISION OF THE CODE OF SAFETY FOR NUCLEAR MERCHANT SHIPS (NUCLEAR CODE, RESOLUTION A.491(XII))

Delegations will find attached a draft submission by the **Netherlands** in view of the 12th session of the IMO Sub-Committee on Ship Design and Construction (SDC 12) (agenda item 9).

The Netherlands invites interested Member States to take note of/support the document.

INTERNATIONAL MARITIME ORGANIZATION

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Sub-Committee on Ship Design and Construction
12th session
Agenda item 9

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REVISION OF THE CODE OF SAFETY FOR NUCLEAR MERCHANT SHIPS (NUCLEAR CODE, RESOLUTION A.491(XII))

Submitted by the Kingdom of the Netherlands

SUMMARY

Executive summary:	This document identifies the potential use of nuclear energy in maritime and proposes a roadmap including a timeline for revising the Code of safety for Nuclear Merchant ships (Nuclear Code, Res.A.491(XII).
Strategic direction, if applicable:	SD 3
Output:	3.8
Action to be taken:	23
Related documents:	MSC 108/INF.21, MSC 109/WP.9, MSC 110/18/16, MSC 110/WP.1/Rev.1

Introduction

1 At MSC 110, the working group (here after: the group) on the “Development of a safety regulatory framework to support the reduction of GHG emissions from ships using new technologies and alternative fuels” prepared instructions to the SDC Sub-Committee (MSC 110/WP.9, Annex 5).

2 One of the instructions is relating to the revision of the nuclear code. The SDC Sub-Committee is requested to start this work at SDC 12, if possible, prepare a workplan and report to MSC 111. Member States and international organizations are invited to submit relevant documents for consideration by SDC 12 (par.26 and 27 in MSC 110/WP.9). MSC 110 agreed to the proposed instructions to the SDC Sub-Committee.

3 This document intends to support the work of the SDC Sub-Committee and proposes a roadmap for the revision of the nuclear code taking into account the technological developments and relevant initiatives.

Background

4 At MSC 108 WNTI submitted document MSC 108/INF.21 containing a comprehensive gap analysis which provides a framework for the development of a revised Nuclear Code adopting the non-prescriptive technology neutral approach used by IAEA in their safety standards.

5 At MSC 110 there was a proposal (MSC 110/18/16) for an output to extend the application of SOLAS chapter VIII and the Code of and the Code of Safety for Nuclear Merchant Ships to non-self-propelled Floating Nuclear Power UnitsPlants (FNPPs) to regulate the safety of such units. The Committee did not agree to include the proposed output in the work programme. However it was noted that a separate set of non-mandatory provisions addressing safety requirements for FNPPs could be developed at a later stage, taking into account that inter-agency work in cooperation with the IAEA might be necessary (par.18.87 in MSC 110/WP.1/Rev.1)

6 At MSC 110 the Committee requested the Secretariat to continue close cooperation with the IAEA Secretariat on issues related to commercial nuclear-powered ships, so that the experts from both organizations could cooperate, with a view to coordinating relevant actions and identifying regulatory needs (par. 20.13 in MSC 110/WP.1/Rev.1).

Use of nuclear energy

7 It is important to highlight that from a regulatory perspective, in accordance with the decision of MSC 110, FNPP's are to be seen separately from the revision of the nuclear code (par.3 above). However it has to be noted that from a technological point of view there is a link. In order to use nuclear power for propulsion it is expected to develop first a reactor for installation on a non self-propelled floating units on a fixed location, notably within the 6 miles zone.

8 Based on the knowledge gained on non-propelled floating units, nuclear energy generated by a reactor can be utilized on board ships for propulsion (nuclear ships) or for the hybrid solution: use of nuclear energy on the high seas and propelled by conventional fuel or alternative fuels and technologies in the 6- or 12-miles zone.

Nuclear power on board propelled ships

9 Propelled units with nuclear power generation on board might use nuclear power for mission equipment such as offshore drilling and heavy lift or propulsion. Safety regulations should be developed taking into account traffic on sailing routes and near port operations. This should foremost take into account the possibility to use nuclear power on the High Seas, and conventional fuel or alternative fuels and technologies within the 6 or 12 miles zone. This option provides the possibility to use nuclear power outside the vicinity of ports and when approaching a port it would be possible to switch to the alternative fuel/technology and not use nuclear power when in port. The risk profile of this case would differ from a ship or unit which uses nuclear power as a sole means of propulsion and power.

10 In addition to the gaps and barriers mentioned in MSC 110/WP.9, careful consideration should be given to the different risk profiles and associated regulations for the near port operations of propelled units with nuclear power, depending on the nuclear power being (or not) engaged for propulsion.

Technological developments and initiatives – Nuclear and Maritime

11 Onshore nuclear developments include Advanced Nuclear Reactors and Small Modular Reactors. The range of power output is wide and runs from 10 MWe and are therefore potential solutions for maritime applications. Companies developing nuclear reactors of suitable size for maritime applications have gathered in various initiatives to promote nuclear power on board ships and floating units.

12 IAEA provides the regulatory framework for nuclear reactors and is modifying the codes and guidelines to cover reactors other than large size Light Water Reactors. It is important that these modifications also include guidelines for maritime application and the additional demands for use on the High Seas, such as the environmental conditions and the associated ship motions, remote operations and other risks including flooding.

13 The IAEA launched in 2024 an initiative "The Atomic Technologies Licensed for Applications at Sea (ATLAS)" aiming to establish a framework for the use of nuclear power in the maritime industry[1]. It is acknowledged that the approach towards safety, security and safeguards from IAEA is essential for the maritime applications. To ensure a workable result for maritime and offshore applications, cooperation with IMO is essential (par.6). Solutions suitable for land operations, such as recovery, reliance on external means of protection and environmental threats may need adaptations for the maritime applications.

Challenges

14 Industry initiatives have also joined forces to investigate suitable nuclear concepts for shipping and offshore contractor purposes. A challenge that appears in the feasibility studies is to align codes and guidelines developed by the different bodies (e.g. IMO and IAEA). Ownership and liability are different for maritime application compared to land-based situations. Commissioning and maintenance operations may occur at different locations. Hence, especially for security and safeguards, extensive collaboration and understanding of nuclear and maritime matters are essential.

15 Mutual acceptance of a licensed reactor for propulsion on board a ship is a topic which deserves discussion in close cooperation between the IMO and the IAEA. For international shipping harmonization has been achieved for Ports State Control through international certification and survey requirements (e.g. Harmonized System of Survey and Certification (HSSC), Resolution A.1186(33)). So far the licensing is limited to land based applications or FNPP's therefore harmonisation and international acceptance has not been relevant.

Social trust and cost- benefit

16 The adoption of Nuclear Power on board floating units or ships requires social trust from member states and their stakeholders. Whilst the interest for nuclear energy both onshore and offshore has grown in the recent years, questions regarding safety, security and safeguards are to be legitimately expected. The IMO approach towards nuclear power should address the societal concerns in order to gain trust. This would include requirements for entering the ports, crew familiarization and protection, response to incidents, demolition, waste treatment and non-proliferation, besides the robust selection and description of safety cases to be addressed. The distinction between the use of nuclear propulsion within approaches to port and use of nuclear power only away from port should be part of the considerations.

17 Nuclear propulsion and power generation on board ships or FNPPs will require an initial investment from the owners and manufacturers of nuclear energy power plants. The power plant should always be new-build, large power and should be subject to requirements to consider and prepare for manufacturing, maintenance and end-of-life. Once the installation is designed and built, the running costs are predictable. With refuelling periods of 2 to 20 years, ship and offshore operations can be independent and autonomous. For ship owners and offshore contractors, the perspective of nuclear energy might be attractive in terms of total cost of ownership and independent and extended service.

[1] Atomic Technologies Licensed for Applications at Sea (ATLAS) Project, Source: IAEA Year in Review 2024 | IAEA

18 In order to lower the risk of successful introduction of nuclear energy on ships and floating units, IMO should consider the total picture of nuclear energy from cradle to cradle, and incorporate the societal trust as a driver to establish a clear and trustable code.

Proposals

19 In Annex 5 of document MSC 110/WP.9 the sub-committee on Ship Design and Construction (SDC) has been identified as the suitable body for carrying out the revision of SOLAS Chapter VIII and Resolution A.491(XII). Given the complexity and the challenges of the regulatory framework (e.g. safety of the reactor, safety of the ship, security, risk for human environment) it is the cosponsors view that additional IMO subcommittees need to be involved. It is proposed to assign SDC as the coordinating body and include SSE, CCC and HTW as associated bodies.

20 Close cooperation between the IAEA and the IMO is essential for updating the nuclear code. It is proposed to establish a joint working group (JWG) between IAEA and IMO for the effective revision of the nuclear code.

21 Taking into account the above the following workplan is proposed:

SDC 12 (2026)	Start with an inventory of topics/challenges relating to the use of nuclear reactors for maritime applications (par. 14, 15 and 16 above); Identify gaps and challenges in the relevant regulatory framework (e.g. safety of the reactor, safety of the ship, security, risk for human environment, operational profile) and identify the relevant regulatory body (par. 19 and 20 above); Establish a correspondence group to start with the review of the gap analysis in document MSC 108/INF.21 and identify additional topics which need to be included based on the inventory;
MSC 111 (2026)	Consider SDC 12 Report and agree to establish JWG IAEA/IMO
JWG IAEA/IMO (2026)	Identify which working packages in ATLAS Project are relevant for the revision of the nuclear code and other challenges based on the inventory finalized at SDC 12; Ensure alignment in the definitions in IMO and IAEA regulations: Discuss the compatibility between certification of ships and licensing of a reactor installed on board ships (par. 15 above) Align the tasks and timeline of ATLAS project with the revision of SOLAS Chapter VIII and Resolution A.491(XII)
SDC 13 (2027)	Consider the report of the JWG IAEA/IMO to progress the revision of the nuclear code.

Action requested to the Committee

22 The Committee is invited to note the information in this document, consider the proposal in paragraphs 19 to 21 and take action, as appropriate.

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