

Classification Requirements for Floating Nuclear Power Plants (FNPPs)

American Bureau of Shipping (ABS)

Meg Dowling

Derek Novak

Jin Wang



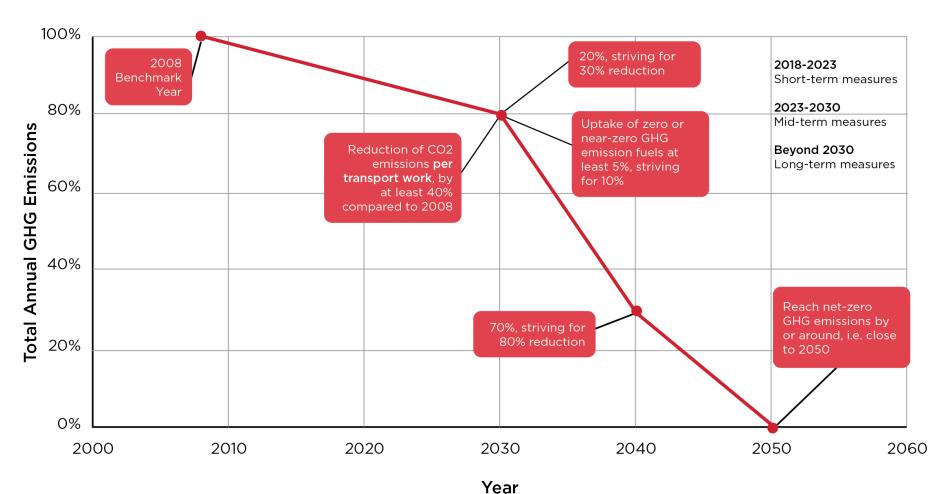
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Maritime Demand for Decarbonization

IMO GHG Reduction Targets



- International Maritime Organization (IMO) targets eliminating all greenhouse gases from shipping by 2050
- Mid-term measures must be adopted in the 2030s



Maritime Demand for Decarbonization



Alternative Fuels and Energy Sources **Light Gas**

LNG

Hydrogen **Ammonia**

Heavy Gas Bio/Synthetic

Biofuels (Regional)

LPG/Methanol

Biofuels (Global)

Nuclear

Small Modular Reactors



Technology Improvements **Hull Resistance**

Hull Optimization & ESD Options

Air Lubrication

Electrification

Hybrid & Electric Propulsion

Batteries & Fuel Cells

Carbon Capture

Solar

Energy Capture

Emission Controls

Wind



Contractual

Reporting

New Charter Arrangements

Routing

Speed Optimization, Weather Routing Just in Time Shipping

Vessel Performance Reporting

Fleet Interactive Performance

Pathway to 2050



2050

Maritime Regulatory Framework

International Maritime Organization (IMO)

 Codes and standards for commercial vessels endorsed and implemented by member States



Classification Societies (Class)

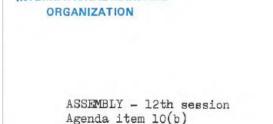
- International Association of Classification Societies (IACS)
- Non-Governmental Organizations (NGOs)
- Establish and administer standards for design, construction and survey
- Appointed by flag Administrations as Recognized Organization (RO) to perform statutory inspections



Requirements for Nuclear Propulsion

International Regulations

International Convention for the Safety of Life at Sea (SOLAS) Chapter VIII: Nuclear Ships



INTERNATIONAL MARITIME

Distr. GENERAL A XII/Res. 491 18 June 1982

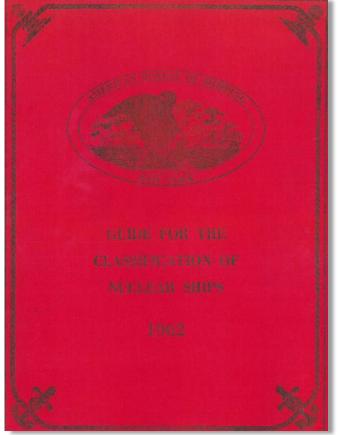
Original: ENGLISH

RESOLUTION A.491(XII) adopted on 19 November 1981

IMO

CODE OF SAFETY FOR NUCLEAR MERCHANT SHIPS

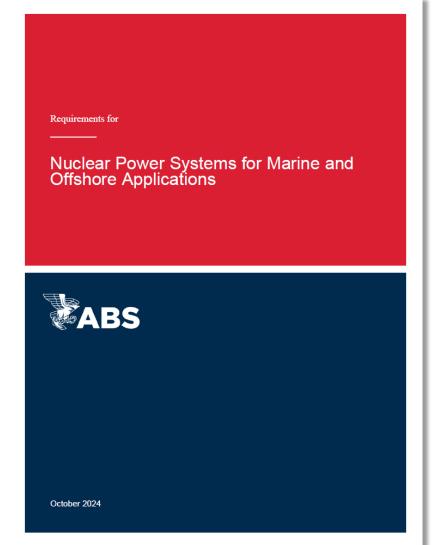
Classification Rules





ABS Requirements for Nuclear Power

- Non-nuclear propulsion maritime applications (i.e., FNPPs)
- Mandatory Power Service (Nuclear) Notation
- Suitable for any type of nuclear technology
- Designated interface between stakeholders according to marine or nuclear service





Stakeholder Roles











Risk Assessments

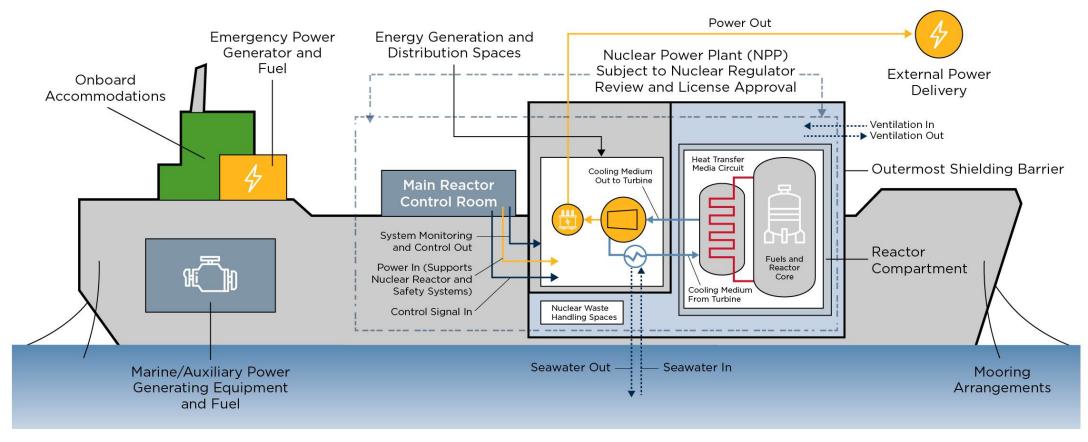
Considerations for Maritime Applications

Nuclear Hazards Imposed on Marine Safety Marine Systems Radioactivity Thermal Energy **Marine Hazards Imposed Corrosive Materials** Unit on Nuclear Safety Safety Structural Loads Motions Onboard Fire Nuclear External Hazards Systems Mooring



Interface Document

Establish Technical Agreement Among Stakeholders





Key Takeaways

- Classification functions as RO of flag Administration
- ABS class requirements allows for any type of nuclear technology for FNPP use
- Process involves nuclear regulator to license reactor(s)

- Risk assessment informs design decisions
- Interface document must be developed and agreed upon to establish the division of responsibility between review and approval authorities



