

Environment

Circular Economy

Governance

- Policy
- Organization

Strategies and Risk Management

- Policy

Initiatives

- Ship recycling
- Initiatives to Reduce Waste and Resource Usage Charges

Co-creation with External Parties

- Participation in Ship Recycling Information Disclosure Platform
- Basic Design Completed for Replacing the Main Engine of Old LNG Carriers with High-efficiency Engine
- Recycling of Used Vehicle Lashing Belts on Pure Car and Truck Carriers Commenced

Circular Economy

Governance

Policy

The NYK Group is advancing its initiatives by striving to collaborate with diverse stakeholders throughout the value chain, working to conserve resources and energy, reduce waste and recycle, encouraging responsible ship breaking in a transparent manner that takes safety, the environment, and human rights into consideration in ship recycling, and stipulating our commitment to the circular economy in the "NYK Group Environmental Policy."

Organization

Please see "Environmental Management" for the governance structure of environment-related issues.

For more information, click on the link below.

[P.029 Environmental Management](#)

Strategies and Risk Management

Policy

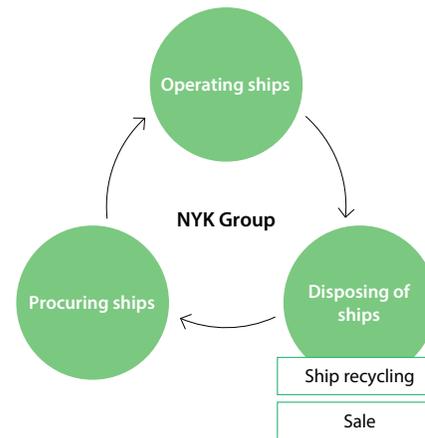
In our marine transportation business, we are pursuing initiatives with an eye on the circular economy at every stage of our operations, including "procuring ships," "operating ships," and "disposing of ships."

Ships contain a large amount of high-quality steel materials, and more than 90% of the medium or large sized ships are recycled on a weight basis. Appropriate disposal of these valuable recyclable resources is important for the realization of a circular economy.

Ahead of entering the Ship Recycling Convention, we have

incorporated the convention's standards and created a list of hazardous substances used on board our ships. In addition, we are working on ship recycling in certified yards that meet our standards, taking into consideration environmental measures, occupational health and safety, and respect for human rights.

Image of the Circular Economy



Flow of Ship Recycling



For more information, click on the link below.

[P.061 Ship Recycling](#)

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Circular Economy

Initiatives

Ship recycling

• Towards Enactment of Hong Kong Convention

Environmental pollution and industrial accidents in India, Bangladesh, and other countries in which vessels are dismantled, became an international concern in the 1990s. Subsequently, as a major shipbuilding and shipping nation, Japan focused on creating an international framework for solving this issue under the International Maritime Organization (IMO), resulting in the adoption of the Hong Kong Convention in 2009.

Since then, to build momentum for the early entry into force of the Convention, we have been a pioneer in incorporating the Convention's standards and working to establish the Convention as a standard among all stakeholders in ship recycling. With the expectation that Bangladesh, the world's largest vessel dismantling country, will ratify the convention, we began dismantling a vessel owned by our group at a yard in Bangladesh, and became the first Japanese shipping company to do so. Dismantling of the vessel was successfully completed in June of that year.

In June 2023, Bangladesh along with Liberia, which owns many flag-of-convenience ships,* ratified the Convention, thus fulfilling the requirements for the Convention's entry into force. Hong Kong Convention will come into effect on June 26, 2025.

India has also ratified the Hong Kong Convention in 2019. Prior to this, in 2016, Japan Marine Science Inc., a member of the NYK Group, had provided consulting services to 70 ship-recycling yards in India. The consulting included civil engineering work for renovation, selection of equipment such as waste incinerators and hazardous material treatment equipment, assistance in bidding, and assistance in construction management in the "Preparatory Survey on the Ship Recycling Yard Improvement Project in India" conducted by JICA.

*Flag-of-convenience ship: A ship registered in a flag-of-convenience country (such as Panama or Liberia) that allows ships owned by foreign individuals or corporations to be registered.

For more information, click on the link below.

P.062 Bangladesh Ship Breaking Yard Added to NYK's Certified Yards

• Our Ship Dismantling Policy

We implemented the following ship breaking policy prior to the Convention's ratification, and we will continue to improve it by carrying out ship dismantling at our certified yards and monitoring the process.

- An inventory of hazardous materials (IHM*) is to be prepared for all ships owned by NYK and its group companies and kept on board. Ships that are likely to be dismantled will be given priority in the preparation of the IHM, and this document will be securely kept on board and presented at the time of delivery to the yard.
- We will visit the yards that have been issued a Statement of Compliance under the convention by the classification society, and the yard will be certified by us if it meets our own standards, which take into consideration ISO 14001/9001/30000/45001 certification.
- We will periodically visit our certified yards to confirm that the level of environmental and occupational safety and health is maintained in accordance with our ship-recycling policy and standards.
- We will use our own contract format for ship recycling, and after delivery to the yard, we will confirm the status of safety and environmental measures based on the contract and monitor the ship-recycling process.

*IHM (Inventory of Hazardous Material): A list detailing the location and approximate quantities of hazardous materials, waste and stockpiles on board



For more information, click on the link below.

- ▶ **List of our certified yards**
<https://www.nyk.com/english/sustainability/pdf/environment012en.pdf>
- ▶ **NYK's Ship Dismantling Performance**
<https://www.nyk.com/english/sustainability/pdf/environment013en.pdf>

• Bangladesh Ship Breaking Yard Added to NYK's Certified Yards

NYK has added the PHP Ship Recycling Facility (hereinafter "PHP Yard"), a ship breaking yard operated by PHP Ship Breaking and Recycling Industries Ltd. in Bangladesh, to the list of certified yards that meet NYK's standards for environmental measures, occupational health and safety, and respect for human rights.

The NYK Group deploys supervisors to ship breaking yards that have been issued a "certificate of compliance" by the Nippon Kaiji Kyokai and other organizations. If the yard passes an audit based on NYK's own stricter standards, the yard is deemed a certified yard, after which the NYK Group-owned ships are dismantled at that yard. While yards in India, China, and Turkey have previously been certified, PHP Yard is the first ship breaking yard in Bangladesh to become our certified yard.

In March 2023, NYK Group's NYK Bulk & Projects Carriers Ltd. brought its heavy lifter named "Kamo," to the PHP yard, and successfully completed the dismantling of the ship in June of the same year. The Bangladesh government ratified the Hong Kong Convention on June 26 of the same year, and this is the first time a Japanese shipping company has conducted vessel dismantling at a yard in the country that meets the standards of the Hong Kong Convention.

In addition to supervisors from the ship management company, NYK dispatched navigation officers and engineers to complete the dismantling of the ship, ensuring that hazardous substances, including bunker oil, were controlled and that safety procedures for ship breaking were followed. We also confirmed that human rights

Environment

Circular Economy

Governance

- Policy
- Organization

Strategies and Risk Management

- Policy

Initiatives

- Ship recycling
- Initiatives to Reduce Waste and Resource Usage Charges

Co-creation with External Parties

- Participation in Ship Recycling Information Disclosure Platform
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Circular Economy

were thoroughly respected through human rights due diligence conducted by a third party, following the UN Guiding Principles on Business and Human Rights.

Initiatives to Reduce Waste and Resource Usage Charges

Honma Corporation, one of our Group companies, is working to reduce waste and resource consumption through intermediate treatment and recycling of waste collected mainly in Tokyo and Yokohama. In addition to intermediate processing of industrial waste, the company has been engaged in the recycling of household plastic containers and packaging since 2006 on behalf of the city of Yokohama. In addition, the company manufactures and delivers RPF (solid fuel) made from waste plastics and wood waste to paper manufacturers and other customers.

[Link](https://www.hnm.co.jp/business/environment/) For more information, click on the link below.

Co-creation with External Parties

Participation in Ship Recycling Information Disclosure Platform

With the aim of achieving a circular economy through appropriate recycling of recyclable resources and preventing industrial accidents and environmental pollution, in May 2021, NYK became the first Japanese shipping company to join the "Ship Recycling Transparency Initiative" (SRTI), which is organized by the Sustainable Shipping Initiative, an international non-profit organization that conducts cross-industry activities to contribute to a sustainable maritime industry.

SRTI, which consists of shipping companies, shippers, and

investment institutions from around the world, is a platform for disclosing information on ship breaking policies and practices of shipping companies to stakeholders. Through information disclosure with SRTI, NYK strives to improve transparency in the ship breaking process and promote responsible ship recycling that takes into consideration safety, the environment, and human rights in the maritime shipping industry.

Basic Design Completed for Replacing the Main Engine of Old LNG Carriers with High-efficiency Engine

NYK is working with Namura Shipbuilding Co., Ltd. and Sasebo Heavy Industries Co., Ltd. to retrofit the main engines of moss-type LNG carriers equipped with steam turbine engines*¹.

LNG is considered to be an important energy source for the transition to a decarbonized society, and transportation demand is expected to grow steadily in the future. On the other hand, due to the limited number of new LNG carriers that can be procured, and the fact that steam turbine engine LNG carriers are gradually being decommissioned due to their inferior fuel efficiency compared to diesel engine LNG carriers that are currently widely used, there is concern about a shortage of shipping capacity for LNG transport.

As a solution to this problem, the three companies aim to replace the main engines of the steam turbine LNG carriers with state-of-the-art, dual-fuel, low-speed diesel*² "X-DF engines." Adding to the improved performance achieved by replacing the main engine, the moss-type LNG tanks*³ installed on a steam turbine engine LNG carrier are tough and designed to withstand long-term use, contributing to the effective utilization of a ship's resources.

In October 2023, NYK became the first company from Nippon Kaiji Kyokai to receive AiP*⁴ certification for main engine conversion for LNG carriers. By accomplishing the main engine conversion, the three companies will support stable LNG transport and contribute

to the effective utilization of ship resources with the technological capabilities of the Japanese maritime cluster.

*1 Steam turbine engine: An external combustion engine that heats fuel in a boiler, produces high-temperature, high-pressure steam, and injects it into an impeller to generate rotational energy. It is highly reliable and suitable for larger ships, and was widely used in early LNG carriers.

*2 Dual-fuel diesel engine: An internal combustion engine that generates rotational energy by directly burning fuel. Thermal energy is more efficient than steam turbines. With advancement of the technology, the engine size has become larger, and in recent years they have been used in many LNG carriers. The engine can switch between two types of fuels, that is, heavy bunker fuel and natural gas fuel.

*3 Moss-type LNG tank: A spherical LNG tank. Its thick and sturdy structure has led to its adoption in many Japanese-built LNG carriers.

*4 AiP (Approval in Principle): Basic design approval

Recycling of Used Vehicle Lashing Belts on Pure Car and Truck Carriers Commenced

In April 2024, NYK and its group company, NYK Trading Corporation, together with Azbil Yamatake Friendly Co., Ltd. and Kayama Kogyo Co., Ltd., began recycling old vehicle lashing belts used on pure car and truck carriers.

We collect lashing belts that are past their expiration date from the pure car and truck carriers operated by NYK, and Azbil Yamatake Friendly Co., Ltd. sorts them into metal parts and belts, while Kayama Kogyo Co., Ltd. manufactures RPF fuel* from the plastic belts. Previously, lashing belts past their service life based on NYK's own safety standards were either disposed of as industrial waste or sold as used products. Going forward, discarded lashing belts will be recycled into RPF fuel, which will be reused as an energy resource.

The entire fleet of pure car and truck carriers operated by NYK discards approximately 200,000 lashing belts per year, which, if all were recycled, would be converted into approximately 20 tons of RPF fuel. In April 2024, at the start of recycling, approximately 27,000 used lashing belts were collected from the pure car and truck carrier, SAGITTARIUS LEADER, at the Port of Nagoya.

Environment

Circular Economy

Governance

- Policy
- Organization

Strategies and Risk Management

- Policy

Initiatives

- Ship recycling
- Initiatives to Reduce Waste and Resource Usage Charges

Co-creation with External Parties

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Circular Economy

*RPF fuel (Refuse derived paper and plastics densified fuel): Solid fuel made primarily from wastepaper and plastics generated from industrial waste that are difficult to recycle. With its high calorific value, it is used as a substitute for fossil fuels such as coal and coke. RPF fuel reduces GHG emissions by about 33% compared to coal, and Kayama Kogyo Co., Ltd. further contributes to the reduction of GHG emissions by using renewable energy sources for electricity used in the production of the fuel.

Recycling Scheme

