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Hitachi Zosen Corporation
Nippon Yusen Kabushiki Kaisha
ClassNK

N_2O Removal System for Ammonia-Fueled Ships Selected to Receive Developmental Support from Japan's Green Innovation Fund

～ Initiative to Reduce Greenhouse Gas Emissions from International Marine Transportation ～

Hitachi Zosen Corporation. (Osaka; Sadao Mino, President & CEO; hereinafter "Hitachi Zosen") and Nippon Yusen Kabushiki Kaisha (Tokyo; Takaya Soga, President; hereinafter "NYK") are pleased to announce that their jointly proposed "Development of N_2O Reactor for an Ammonia-Fueled Ship" has been selected by the Japan's New Energy and Industrial Technology Development Organization (NEDO) as a "Next-Generation Ship Development", which is additionally invited in November 2023 as part of Green Innovation Fund Projects (hereinafter "GI Fund Projects").

In July 2023, the International Maritime Organization (IMO) set a target of reaching net-zero greenhouse gases (GHG) emitted from international marine transportation by or around 2050. To achieve this target, it is imperative to prioritize R&D towards the creation of next-generation ships that do not emit GHGs. In particular, the development of technology to convert marine fuel from conventional fossil fuels to alternative fuels such as ammonia, which emits no carbon dioxide (CO_2) when combusted, is being promoted as GI Fund Projects.

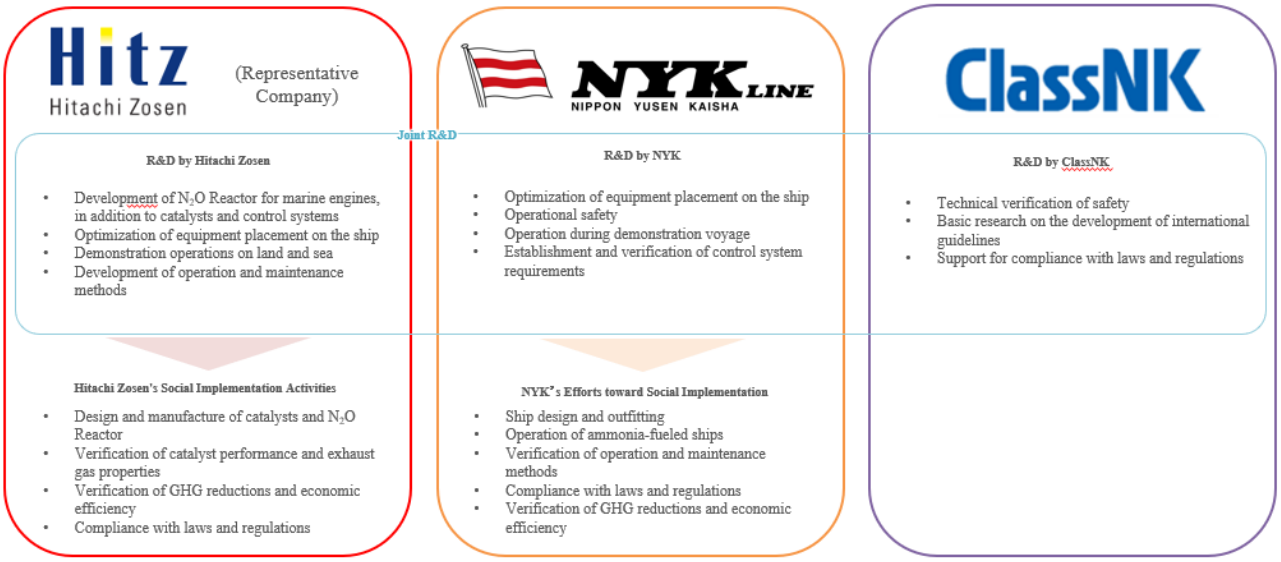
The project jointly proposed by Hitachi Zosen and NYK aims to develop a catalytic removal system (hereinafter "N_2O Reactor") for nitrous oxide (N_2O) emitted when ammonia is used as fuel. N_2O's global warming potential* is about 300 times that of CO_2. Therefore, reducing N_2O emissions is essential in order to realize ammonia-fueled ships that are highly effective in reducing GHG emissions. By developing and disseminating an N_2O Reactor, we are aiming for the early realization of a carbon-neutral in international maritime transport.

Hitachi Zosen has a strong track record and know-how in catalytic technology, including the development of a marine vessel selective catalytic reduction (SCR) system for removing nitrogen oxides (NOx) in marine engines. In this project, Hitachi Zosen develops catalysts and equipment to reduce N_2O for marine 2-stroke engines** and optimizes equipment layout.

NYK plans to install the N_2O Reactor developed by Hitachi Zosen on an ammonia-fueled ship scheduled to be delivered in November 2026. NYK conducts safety and performance verification on demonstration voyages.

As a partner organization, ClassNK will conduct safety verification of N_2O reactors and basic research on the development of international guidelines.

[Roles of each party in this project and initiatives for social implementation]



The three parties will lead the world in environmental technology by actively taking on the research and development of next-generation ships that do not emit GHGs, thus contributing to the reduction of GHGs emitted by international marine transportation.

Project outline:

1.Publicly solicited by : Japan's New Energy and Industrial Technology Development Organization (NEDO)

2.Project name : "Development of Next-Generation Ships" Project (additional public offering), a Green Innovation Fund Project

3.Companies : Hitachi Zosen Corporation, Nippon Yusen Kabushiki Kaisha.

4.Partner organization : ClassNK

5.R&D theme : Development of N_2O Reactor for Ammonia-Fueled Ship

6. Implementation period : Fiscal 2024 to FY2027

※1 Global warming potential

A number that represents how well other GHGs are capable of warming the globe relative to CO_2.

※2 2-stroke engine

An engine that performs one combustion per revolution of the engine (one piston reciprocating), and is characterized by having a small number of parts and being compact light-weight.