

## SPECIAL FEATURE

The NYK Group's Growth Drivers

# Technological Capabilities and Human Resources

Based on its Mission of "Bringing value to life" and the material issues of its businesses, the NYK Group has cultivated service quality, problem-solving capabilities, and the NYK brand while keeping abreast of changes in society and industry. We will advance the current medium-term management plan and sustain growth by elevating these competitive advantages into technological capabilities and human resources that we continuously bolster as real strengths and growth drivers.

**Bringing value to life.**

**Our Value**  
Integrity, Innovation, and Intensity

- Safety
- Environment
- Human Resources

- 2020** Delivered Kaguya, Japan's first LNG bunkering vessel  
Delivered Sakura Leader, Japan's first LNG-fueled pure car and truck carrier  
Opened the Remote Diagnostic Center, which utilizes AI systems that enable continuous monitoring and central management of conditions of engine plants of ships equipped with SIMS
- 2014** Began Big Data Utilization Project  
Utilization of data collected by SIMS
- 2008** Developed Ship Information Management System (SIMS)  
Automatic collection of ship operations-related data
- 2017** Completed Engie Zeebrugge, world's first purpose-built LNG bunkering vessel
- 2004** Established MTI Co., Ltd.  
Establishment through expansive reorganization of NYK Logistics Technology Institute
- 2015** Completed Sakigake, Japan's first LNG-fueled tugboat
- 1997** Established NYK Logistics Technology Institute as an independent organization based on Logistics Technology Institute
- 2012** Launched the Innovative Bunker and Idle-Time Saving (IBIS) Project aiming to realize optimized and extremely economic vessel operations
- 1986** Established Technical Development Center (renamed Logistics Technology Institute in 1995)
- 2014** More Than Shipping 2018  
—Stage 2, Leveraged by Creative Solutions
- 1985** Established Japan Marine Science Inc.  
Utilization of technologies and expertise cultivated in maritime shipping to develop consulting business in the maritime sector
- 2003** NYK21 "Forward 120"  
Taking on challenge of becoming a truly global company
- 1962** Completed world's first large LPG carrier, Bridgestone Maru
- 2006** Became first Japanese shipping company to begin in-house training of Japanese graduates of non-maritime colleges and universities as seafarers
- 2015** Commenced Kirari Dojo (Creative Solutions Workshops) as program to develop innovation leaders
- 2023** Formulated the NYK Group CX (corporate transformation) Story, a strategy for improving the professional skills of Group colleagues even further
- 1986** NYK21  
Beginning to develop into comprehensive global-logistics enterprise
- 2002** Started Global NYK Week  
Development of local employees
- 2019** Formed NYK Digital Academy
- 1989** Established NYK-FII Ship Management Inc.
- 2007** Opened NYK-TDG Maritime Academy (NTMA)  
Establishment of maritime academy in the Philippines to enhance seafarer-training capabilities
- 2020** Reformed human resource system
- 1998** Launched NAV9000, NYK's original safety promotion activities



**Leveraging individuality as a source of value and strength, we will become a truly global company that utilizes the talents of all employees to take on challenges.**



**Yasunobu Suzuki**

Managing Executive Officer  
Chief Human Resources Officer (CHRO)  
Deputy Chief Executive of General Affairs Headquarters

**Transforming Homogenous Human Resource Development**

The NYK Group has remained the preferred choice of customers thanks to its operational quality, which has been cultivated through the continuous pursuit of safety. We have been growing by rolling out this quality globally.

Quality is created by personnel who continue refining it. In other words, we have had to maintain a workforce with the ability to provide quality services in all manner of situations. We have developed our human resources for this purpose. However, the NYK Group is now making a major change in its human resource development policy.

In its medium-term management plan, the Group has set out ambidextrous management as a goal. In addition to its traditional transportation services, the Group is currently participating in the field of service creation. Further, the Group is broadening its view of the ocean from a place for transportation to a place for work. Ships themselves can serve as a means of transportation as well as an instrument that can be utilized in businesses to fulfill objectives related to construction, operation, and management. Yasunobu Suzuki, who is chief human resources officer, explains his strong commitment to change.

“The trust that we have earned from our customers as a result of the track record and quality built up over the years is an important foundation for our existing businesses. We must continue to develop and enhance this trust. However, taking on the challenge of new businesses does not simply mean continuing the established approaches of existing businesses. We are likely to be involved in the establishment of new organizations such as joint ventures. To play fully active roles in these situations, we will need personnel who not only combine specialization with broad knowledge and experience but also have insight related to accounting, legal affairs, and other business management areas. Until now, to maintain quality in the form of safe, reliable cargo transportation,

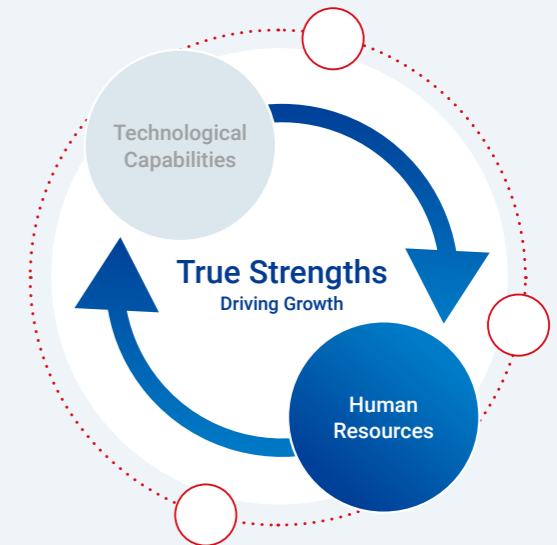
we have tended to emphasize homogeneity in our human resource development. Given our future growth strategy, we must change to the development of personnel who possess distinctive job performance skills.”

Since 2023, NYK has been reforming its career support system with the aim of developing business leaders (who possess distinctive job performance skills). Both internally and externally, we have communicated that our goal is to create a group of personnel who possess multiple distinctive job performance skills as well as knowledge and personal networks in the departments, countries, and regions where they can utilize their skills. In 2024, we finally began implementing concrete measures in this regard.

**Encouraging Group Employees to Create Career Stories**

October 2023 saw the announcement of the NYK Group CX (corporate transformation) Story, which covers the entire Group. In addition to defining the five employee capabilities required for the realization of our management strategy, the story is structured around three concrete measures that are aimed at achieving our target organizational profile: Talent Development, Organization Development, and Enhancement of Governance.

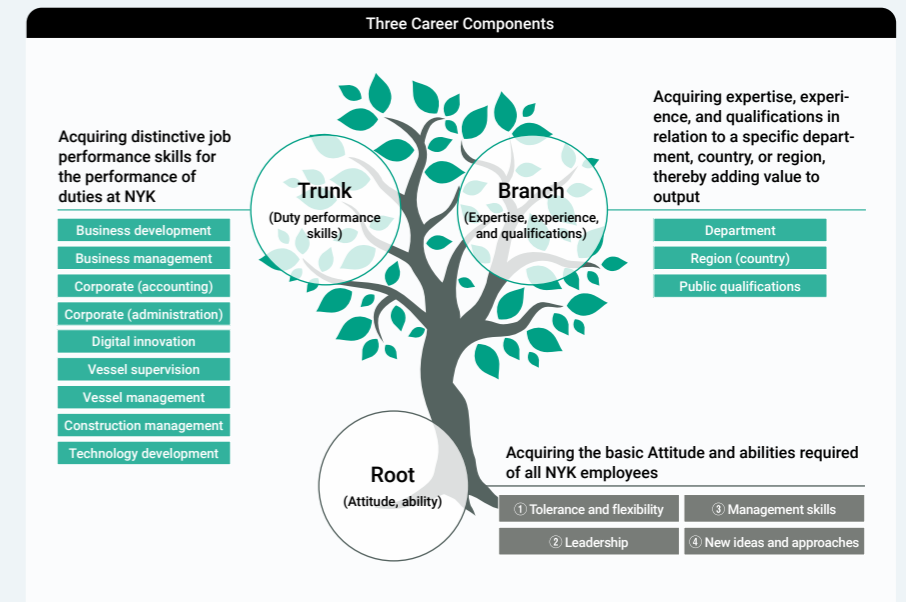
The NYK Group CX Story includes a wide range of measures, such as the hiring and training of specialized personnel and personnel transfers among Group companies, including overseas Group companies. However, the main aim is for employees to develop their careers autonomously. Suzuki explains that the foundation for this autonomy lies in each employee having their own career story. “Why do this? What do I want to be? How do I want to grow? I believe that by setting out their own growth story and taking ownership of their career development, each employee will realize personal growth and achieve their goals at work.”



Suzuki himself has in-depth experience of tackling major changes in organizations and their workforces. These include the establishment of NYK Bulkship (Atlantic) N.V. as well as the launch of Ocean Network Express Pte. Ltd. (ONE) and the accompanying transfer of existing container businesses. Recalling his experience, he emphasizes that the members of his multinational team have followed him because he has considered and communicated the story for the Company and the story for team members and steadfastly discussed matters with them.

For junior employees with limited work

experience, identifying their own distinctive job performance skills and envisioning a career story are challenging tasks. However, NYK has a bold job rotation system that allows employees to move not just between frontline operations and the head office but also between domains, regions, divisions, and Group companies. After personnel join the Company, rotations are carried out approximately every three years and continue through to the mid-career stage. Consequently, employees transfer to at least three positions in different fields over the course of 10 years, giving them a greater breadth of experience. Suzuki



explains the merits of job rotation. “As well as increasing experience, job rotation provides personnel with opportunities to realize and develop their own distinctive job performance skills through engagement with a wide range of people. In addition, job rotation expands an employee’s network of personal contacts, making it easier to find collaborators and establish cross-divisional collaborations when tackling new tasks. I want employees to actively utilize autonomous career development.”

In fiscal 2023, the Company established the Global Challenge Program, which publishes and seeks applicants for positions available throughout the Group. The program now includes overseas assignments, for which a certain degree of experience was a prerequisite, thereby providing more opportunities for junior employees to extend their learning. As of July 2024, the program has sought applicants on four occasions. We plan to steadily increase the number of in-house recruitment drives. In conjunction with these efforts, we will reform the company housing and overseas work systems to invigorate job rotation.

Moreover, we will increase the number of options for autonomous training. The training program, in which personnel uniformly participated until mid-career, has been changed to a system that allows employees

to take courses as needed regardless of age and within the context of their own career stories. Also, we have increased the number of available courses.

### Becoming a Truly Global Company That Leverages the Individuality of 35,000 Employees to Take On Challenges

In April 2024, the Global HR (Human Resources) Team was established within the Human Resources Group. The team has been tasked with promoting global inclusion by stepping up transfers. These efforts will encompass not only the existing practice of mainly transferring Japanese employees to overseas bases but also transfers of personnel from overseas bases to Japan as well as to other overseas bases. Suzuki is enthusiastic about this new approach. “Although the Group is engaged in businesses around the world, in reality it is a corporate group founded in Japan that has developed overseas based on Japanese methods. To grow from ‘A Japanese Company Operating Globally’ into a truly global company, we will establish the basis for the participation of local employees in business management in keeping

with the concept of ‘A Global Company Headquartered in Japan.’ We intend to focus even more on diversity and inclusion (D&I).”

Until now, our overseas network has been built on the foundation of our global containership business. Suzuki explains that the previous way of doing things stemmed from the fact that many of the Group’s customers were Japanese companies, which enabled a limited number of head office employees to lead 35,000 Group employees. “However, the containership business has already been transferred to ONE. We have lost the network we once had. Rather than only providing transportation, we will also take on the challenge of establishing new businesses through co-creation with various stakeholders. But, to create new value beyond the boundaries of the maritime shipping and logistics businesses in an environment characterized by a chronic shortage of labor and great uncertainty over geopolitical and decarbonization trends, we must establish foundations that assign ‘the right person to the right place’ and empower everyone, regardless of nationality, to work with vitality.” To this end, we have revised and strengthened the capabilities of our regional human resource organizations by introducing a system that promotes the transfer of local employees to

Japan or to countries other than Japan. Also, global meetings on human resources will be held on a regular basis.

Since the announcement of the NYK Group CX Story, Suzuki has visited four overseas offices in New Jersey (the United States), London (the United Kingdom), Singapore, and Shanghai (China) to directly brief local employees of Group companies. In addition to communicating future policy measures, Suzuki emphasizes fostering the culture of a global corporate group. “What are we? I want to create a mission-oriented culture in which we can mutually enhance each other by considering the connection between the corporate philosophy of the NYK Group, ‘Bringing value to life,’ and our strategies and our own work.” The story was very well received, for all employees considering what value will mean in the future and finding value beyond the scope of a comprehensive global logistics enterprise. Strongly focused on their careers, our employees are increasingly looking forward to the imminent establishment of an environment that does not have boundaries and where all 35,000 employees will be able to play active roles.

In addition, garnering experience outside the Company is becoming even more important in creating new value. While we intend to accelerate cross-border assignments between the head office and Group companies, it is also necessary for Group companies to utilize their human capital for their own growth.

To support active transfers in the future, the Human Resources Group has begun rebuilding the system through which it cooperates with regional human resource organizations and Group companies. Not only through collaborations among the human resource divisions but also through collaborations that include other corporate divisions and business divisions, the Group will realize transfers based on skills and career aspirations and enhance its overall capabilities.



### Viewing Navigation Officers, Engineers, and Naval Architects as the Source of Our Strength and the Key to Transformation

NYK is progressing with the inclusion of navigation officers, engineers, and naval architects, who are the Company’s most differentiated form of human capital. In 2023, the Decarbonization Group, which belongs to the ESG Strategy Headquarters, led the preparation of the NYK Group Decarbonization Story, setting out the Group’s strategic direction in relation to decarbonization. The Decarbonization Group includes navigation officers and engineers who are involved in the formulation of international environmental regulations, conversant in the specialized field of practical operations that are compliant with regulations, and possess expertise in ship operations; naval architects who have developed ships; and personnel who have experience in ship investment and the analysis of internal carbon pricing (ICP) frameworks. By bringing together expertise covering a wide range of fields—ranging from trends in environmental regulations through to practical operations—to conduct repeated simulations, the team is able to refine ideas and set out a bold, detailed road map.

Navigation officers, engineers, and naval architects can play active roles in a broad array of fields. They can be immediately effective in new green businesses. By leveraging their expertise, the Company can improve the accuracy of data-driven efforts focused on operational efficiency as well as increase the effectiveness of digital transformation aimed at work efficiency. Suzuki stresses the importance of navigation officers, engineers, and naval architects. “In-house, we call this a ‘cross-domain’ approach. In various places, we want to realize the inclusion of groups of talented technicians so that they can make contributions that transcend organizational boundaries. Among our human capital, navigation officers, engineers, and naval architects are undeniably the source of our competitiveness. They are also a source of pride for us. Thanks to them, we are able to create new businesses. Through concrete achievements, we want to demonstrate that ambidextrous management is not merely pie in the sky.”

Based on global efforts to build each individual’s distinctive job performance skills and to create opportunities for learning and working, the NYK Group will advance into the next era with new strengths.

### Comments from participants in briefings on the NYK Group CX Story

Clear guidance and consistent direction on how to take this vision forward through our HR Organization.

The value lies in each member of the company and thanks to their contribution we can achieve great things. I really look forward to supporting in every phase of this transformation.

It is not easy to change mindset/culture/traditions, so to make the significant transformation from “A Japanese Company Operating Globally” to “A Global Company Headquartered In Japan” needs strong will and direction to carry out the CX Management vision and strategy.

There needs to be more specific steps in ensuring more diversity in HR globally and what NYK plans to do in strengthening horizontal management of NYK employees globally



# CX Story

The NYK Group has formulated its CX 2030 Vision, setting out the capabilities required of NYK Group colleagues to achieve said vision and its target status of the NYK Group for realizing its Group Vision: “We go beyond the scope of a comprehensive global logistics enterprise to co-create value required for the future by advancing our core businesses and growing new ones” Our CX Strategy organizes the initiatives that we will carry out during the current medium-term management plan period. To realize this vision, we will advance talent development and organization development. We will also carry out the

enhancement of governance, which will serve as a foundation for supporting both aspects.

Through these initiatives and the realization of the CX 2030 Vision, we aim to transform over the medium to long term from “A Japanese company operating globally” (where the organization operates globally, but key decisions are made in Japan) to “A global company headquartered in Japan” (where the headquarters is located in Japan, and the organization involves employees with diverse backgrounds in decision-making).

**Aiming to become “A Global Company Headquartered in Japan,”**  
**our diverse human resources will realize the co-creation of**  
**value needed in the future by striving to further develop core businesses**  
**and grow new businesses.**

## CX 2030 Vision

### Targets Status of Organization

A Group that encourages 35,000 Group employees to bring forth their best to take on challenges

### Five Capabilities Required in the NYK Group Going Forward

- 1 Supporting transformation with *gemba* (frontline) expertise
- 2 Innovating through new ideas and approaches
- 3 Thriving in strategic growth areas
- 4 Leading transformation powerfully
- 5 Building and operating businesses

## CX Strategies

### Talent Development

#### Promote D&I Strategic Direction

- Plan to release D&I Policy during fiscal 2024
- Promote cross-border assignments among Group companies and foster diversity in the organization
- Create an environment where everyone can do their best regardless of gender or nationality
- Nurture a culture and improve a system where individual efforts are recognized and valued within the organization

#### Enhance Recruitment and Development, and Promote Cross-Domain Assignments Strategic Direction

- Promote cross-domain assignments and support career development through assignments and participation in projects that cross work areas, countries, and regions
- Expand internal job postings within the Group and encourage participation to promote career development
- Prepare leaders of the next generation to take on Group management responsibilities strategically
- Promote localization of Group company management and decision-making with diverse perspectives by appointing local employees

### Organization Development

#### Strengthen the Global HR function Strategic Direction

- Unify the direction of initiatives and strengthen functions by strengthening connections with four overseas regional HR functions

#### Advance Understanding of the Group's Mission Strategic Direction

- Advance understanding of the connection between the Mission and the Group's history, strategy, and colleagues' own work

#### Improve Employee Engagement Strategic Direction

- Improve the organization using an engagement survey of all Group employees

### Enhancement of Governance

Promote Localization of Group Company Management and Introduce Management Standards

## POINT 1

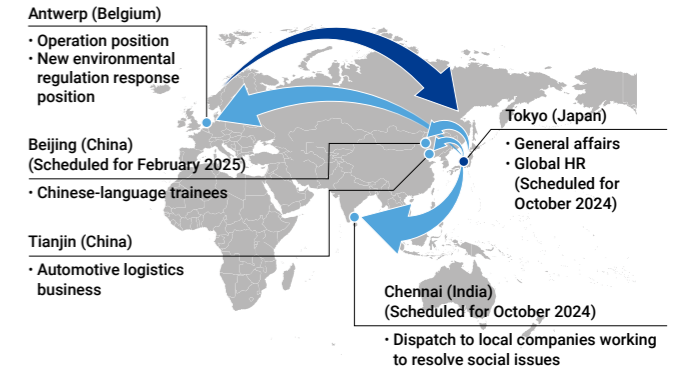
### Promoting Cross-Domain Assignments

Talent Development

#### Promoting Career Development through the Global Challenge Program (Internal Job Posting System)

The Global Challenge Program encourages career development by expanding opportunities for Group employees to take up challenges through a job posting system for diverse positions. Operating in parallel with NYK's internally operated assignment destination appeal system (a system that allows people to express their wish to transfer directly to their desired assignment destination to achieve a transfer), the program aims to increase employee engagement and promote career development.

The Global Challenge Program started operating in fiscal 2023 and has conducted a total of four job postings (as of July 2024). In the first fiscal year, the postings were conducted for employees of NYK, but from fiscal 2024 onward, we have started posting positions at the headquarters in Japan for local employees as well. Going forward, we will utilize our Global HR function to post opportunities for transfers between overseas Group companies.



## POINT 2

### Strengthen the Global HR (GHR) Function

Organization Development

To conduct personnel measures suitable for each region's employment and working environment, we have been following a policy of having each region develop career ownership under local guidance. Going forward, while continuing this policy, we will enhance our sense of unity as a global company and strengthen our system of coordinating with each region to realize the appropriate allocation and utilization of talent across the entire Group.

By sharing information on personnel and talent development between regions, we will invigorate our personnel strategies, such as the abovementioned Global Challenge Program, while also helping strengthen the personnel strategies in each region by deploying them within the Group. Through regular meetings, we will keep abreast of the status of talent and organizations in each region, identifying the Group's current issues and using them to propose and execute Groupwide talent and organizational strategies.



## VOICE



**Liel Reyes Gonzales**  
 Dry Bulk Fleet Technical Team  
 Dry Bulk Marine Quality Control Group

#### Promoting Activities of Maritime Officer Graduates from NYK-TDG Maritime Academy (NTMA)\*

I graduated from NTMA and gained experience as a captain before my current position, which involves addressing dry bulk cost matters for NYK-owned and crew-related projects such as the Shipboard Life Improvement and Seafarers' Health Project.

Cost matters include ascertaining and analyzing the operational status of vessels and budget preparation in coordination with different ship management companies, budget vs. actual analysis, and budget control. My experience managing voyages as a vessel master and studying accountancy before entering the maritime industry certainly helps me in my tasks. As a master, I have always felt that crew morale and motivation are key to safe and successful vessel operations. As a bridge between the head office and crew members, I strive to communicate well with the crew and keep them motivated by helping provide them with good living conditions and a safe working environment.

Other maritime officers who are NTMA graduates, are also working in various departments at the head office. However, there are not so many. I want to encourage the ambitions of young cadets at NTMA by telling them about career opportunities that exist after achieving the rank of master. The NYK head office operates mainly in Japanese, but progress is being made in using English in all office-related processes, day-to-day communications, etc., so that non-Japanese employees can easily navigate without assistance and freely express themselves without hesitation. I believe progress is being made on diversity as a global company.

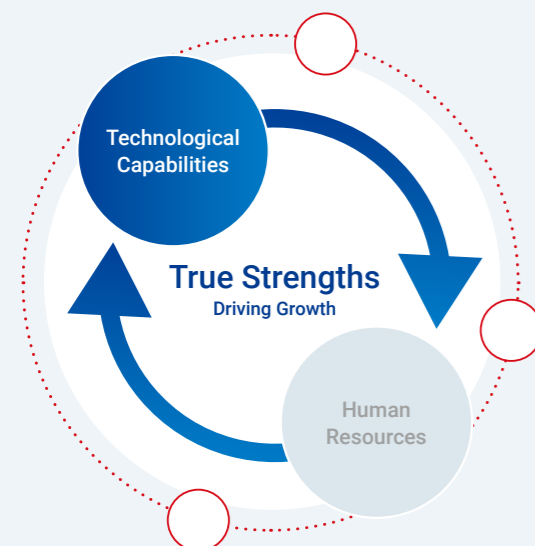
\* A maritime academy jointly operated in the Philippines by NYK and Transnational Diversified Group, a conglomerate that is the Company's strategic partner in the Philippines



**Nobuhiro Kashima**

Senior Managing Executive Officer  
Chairman of Group IT Strategy Committee  
Chief Executive of Technical Headquarters  
(Chairman of Technology Strategy Committee)

**We will advance our technological capabilities into a new phase while visualizing technology strategies to plot the trajectory of future growth.**



### Technological Capabilities: Foundations That Create Our Competitive Advantages

It is no exaggeration to say that the history of the NYK Group's growth is one of technological development. In accordance with its Mission of "Bringing value to life," the Group has met the needs of the times by continuously pursuing ambitious initiatives to develop new ships and to transform its businesses. These initiatives have been based on shipping technology honed through a process of trial and error. The Company's ability to safely operate a diverse fleet of approximately 800 ships around the world and to engage in various businesses beyond the boundaries of the maritime shipping industry is supported by its extraordinary ship technologies and technologies for ship operations. These technologies, in turn, are underpinned by each employee's strong focus on safety. The aforementioned strengths have not only been essential for business continuity but have also contributed to the establishment of significant competitive advantages in the form of added value. The NYK name is now recognized globally. However, the way forward has not always been without challenges for the Company. For example, from its earliest days NYK was exposed to stiff competition from Western shipping companies. Another challenge was the shift from coal to oil fuel in the postwar period. Even in such testing times, NYK has consistently innovated to stay half a step ahead of society and industry and to create value through "delivery." These efforts have shaped the NYK of today.

For the past 10 years, the NYK Group has pursued strategies aimed at creating a cycle of technology-driven value creation. In a business environment subject to market fluctuations, owning a large amount of assets in the form of ships leads to the risk of business performance volatility. However, the Group has tried to find potential in the data that lies dormant in its assets.

Nobuhiro Kashima, who is chief executive of the Technical Headquarters, recalls these efforts. "We believed that the data we had on-site would be a source of future growth. Consequently, we have focused on using all kinds of data in efforts that leverage digital technologies and digital transformation to improve the productivity of existing businesses as well as in initiatives that are creating new green businesses aimed at decarbonization. Looking at our current accomplishments, I feel that we chose the right area to focus on at the outset." In April 2015, former NYK president and current senior advisor Tadaaki Naito promoted a "creative solutions" strategy, set out in the medium-term management plan released a year earlier. In response, the Company pursued initiatives aimed at finding hints in day-to-day frontline operations for solutions that would eliminate the 3Ms (*muda*, *muri*, and *mura*; or non-value-adding activities, excessive burdens, and unevenness in production or work activities) while continuously creating new value. To give concrete form to ideas derived from frontline operations, the Creative Solutions Group (now the Innovation Promotion Group) was established in 2015. Subsequently, the medium-term management plan announced in 2018—Staying Ahead 2022 with Digitalization and Green—called for the combination of the aforementioned initiatives with society's digitalization and decarbonization efforts to create value for the future in fields beyond transportation.

The various initiatives that emerged at this time continue to this day. With respect to enhancing technologies for ship operations, we have stabilized the offshore communication environment. This has enabled the sharing of data on ship operations, fuel efficiency, and sea conditions via common ship-land platforms such as NiBiKi\*1 and the Ship Information Management System (SIMS). This has also enabled the Remote Diagnostic Center in the Philippines to monitor engine plants 24 hours a day. Furthermore, we have developed SHINRAI,\*2

a system that enables integrated risk assessments and manages operational efficiency and safety. At present, based on the data acquired through these technologies for ship operations, we are accelerating the development of new ships and the creation of new business opportunities. By co-creating with many different companies, NYK is advancing toward the creation of new value chains. These initiatives are focused on such areas as autonomous ships, a Ship Data Center Co., Ltd. (ShipDC) concept based on the global standard Internet of Ships (IoS), offshore wind power, and the construction of ships that use low-carbon or decarbonized fuels.

### Technologies That Enable Businesses and Which Directly Contribute to Growth

For the NYK Group's growth strategies, the development of both technologies and businesses is more important than ever, meaning that the Technical Headquarters has an unprecedentedly large role to play. Kashima's policy, however, is simple.

"Technology strategies serve as the drivers of the growth strategies drawn up by each headquarters. When using technologies in the establishment of new businesses, our efforts must always align with the creation of value through 'delivery.' The NYK Group handles a wide range of cargo, from general consumer goods through to energy resources. Each headquarters faces different changes in conditions. While maintaining a deep understanding of the characteristics of each business, the Technical Headquarters must proceed in a unified manner that enables the Group as a whole to maximize business opportunities."

Although we have hitherto conducted R&D on several ideas for new businesses, in the end the ideas that have remained are for businesses similar to our existing businesses. Rather than reflecting a conservative culture, this tendency has probably

been determined by such considerations as whether the businesses would be related to the Group's strengths and whether cycles would be suited to technological capabilities. In decarbonization initiatives, which are attracting attention, the Group plans to focus on existing businesses. However, we plan to take an overall view of the supply chain and advance bold initiatives in upstream fields to capture new business opportunities as we have done in the offshore business.

"Although some technologies have already been commercialized, our new businesses are predominantly still at the experimental stage. Until now, our practice has been to repeatedly conduct technology verification tests premised on ensuring safe, reliable transportation and then select a method that is acceptable and reliable. This is natural for a company that has safety as its top priority. But, from now on unless we take risks and press ahead decisively as a pioneer, there will be no future for either the Company or the maritime shipping and logistics industries. The Technical Headquarters must evolve into an organization that acts as a leader for the entire Group."

In 2020, the Company changed the structure of its technology-related organizations. The groups responsible for all kinds of in-house technologies, such as the Marine Group, Technical Group, Innovation Promotion Group, and DX Promotion Group, were consolidated within the Technical Headquarters. By eliminating the sense of distance among the groups through their inclusion in the same headquarters, we will facilitate the cross-divisional application of technologies and increase the number of opportunities for personnel to propose ideas during trial-and-error phases and to share the latest technological information. In this way, we aim to establish significant foundations that both support and offer robust guidance in relation to ambidextrous management and business transformation. Four years have passed since the NYK Group adopted ESG management. With an

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appetite for taking on new challenges now well established among personnel, we are finally advancing decisively toward practical implementation. Aiming to play a role in supporting and guiding this practical implementation, the Technical Headquarters is focusing on reforming foundations while strengthening cooperation with businesses.

### Transformation into an Organization with a Risk-Taking, Bold Mindset

One aspect of our transformation has involved the reorganization of R&D processes. The criteria for evaluating business investments have been enhanced each year with quantitative yardsticks such as profitability and potential. On the other hand, the discussion of forward-looking investments in technologies under the same mechanism has had issues in relation to selection and other matters. To tackle unprecedented new technologies, a system (the R&D Committee) has been established in which the Management Planning Headquarters and the Technical Headquarters play a central role in discussions. Under this system, risks and returns are verified from multiple perspectives. Important matters that require decisions are reported to the Management Meeting as necessary. This meeting has already discussed several technology investment projects and is endeavoring to improve its discernment. The management side, which actually makes the decisions, also needs to be enhanced. Kashima explains his role. "The R&D Committee and other meetings receive proposals for projects in a variety of new technological fields. I feel that the content of these proposals is becoming increasingly challenging as the pace of technological innovation around the world accelerates. To help top management make appropriate decisions, I try to provide thorough, detailed explanations of technologies. At the same time, I focus on enabling us to have discussions that are based on a

common understanding by giving detailed briefings on the new initiatives of the Technical Headquarters at regular meetings and other meetings."

Kashima says that the utilization of external networks is also important.

"When creating new businesses, in-house ideas are our starting point. But, this inevitably limits the range of ideas available to us. To further the search for insight, the expansion of networks outside the Company is essential."

A common idea is to utilize corporate venture capital to co-create with start-ups that have unique technologies, but this approach also gives rise to a problem. The members of start-ups devote their lives to their technologies and business growth. However, as NYK personnel are replaced after a few years through job rotation, a divergence between their mindset and that of their start-up partners is inevitable. This leads to concern that co-creation initiatives may not continue. To overcome this problem, the NYK Group is envisioning a framework that would deepen collaboration with external parties. "The NYK Group includes MTI Co., Ltd., which specializes in R&D, and Japan Marine Science Inc., which is a consulting business. We are considering the possibility of establishing a strategic framework that would utilize these Group companies more effectively and thereby strengthen their respective advantages even more."

MTI is a spin-off of NYK's engineering organization and was established in 2004 as an independent Group company specializing in R&D. Today, MTI conducts R&D on the environment and maritime shipping while engaging in temporary exchanges of personnel with shipbuilders and ship equipment manufacturers. The company has accumulated a great deal of advanced knowledge. NYK will make effective use of Group companies to remain informed about a range of different possibilities.

Further, the Group uses the expertise of the Technical Headquarters in human resource development. In 2019, NYK Digital Academy was established as an in-house educational institution for teaching innovation-oriented thinking. The academy gives employees the opportunity to acquire skills essential for launching new businesses in an era of increasing uncertainty. "In the NYK Digital Academy program, participants learn business administration and design thinking while actually engaging in discussions with customers and partners and taking on the challenge of creating value and opening up markets. So far, new projects, such as a business engaged in the marine retrieval of rockets and an offshore data center business, have begun in earnest. I feel that the training program has proven to be effective." NYK will apply this business administration training program to a program for the development of digital transformation-focused personnel, which the Human Resources Group is currently considering. We will advance development of tomorrow's human resources that integrates digital literacy enhancement-based business process improvement with the creation of new businesses.

Kashima describes NYK's personnel. "Many of our employees are interested in not only benefiting customers but also improving society as a whole. For this reason, they all have a strong affinity with decarbonization initiatives and tackle them in earnest. On the other hand, if we do not make profits for ourselves, we will not be able to sustain such initiatives. I want to ensure that personnel have the capabilities to develop initiatives into viable businesses." We will combine our strengths in human resources and technologies in a more multifaceted manner to create a major driving force.

### Visualization of Technology Strategies to Plot the Trajectory of Future Growth

In fiscal 2024, all kinds of technology development projects are progressing at the same time. These include the completion of an ammonia-fueled tugboat, transportation of CO<sub>2</sub> in the carbon dioxide capture and storage (CCS) business, the maritime shipping of liquefied hydrogen, the use of methane as an alternative fuel to LNG, and the development of green methanol. However, the results of projects tasked with the new development of decarbonization-related technologies take a long time to become visible.

"Regarding future trends in decarbonization technologies, while the options for solutions have been narrowed down over the past few years, we are still at the stage of trial and error. Seeing what lies ahead is difficult. Many different initiatives are proceeding in parallel. There are also many behind-the-scenes activities that are difficult to see from the outside. I believe that the current phase is the hardest to explain

to investors and other external stakeholders in a readily understandable way." Although these projects are making steady progress in their respective fields, Kashima is of the opinion that not being able to clearly show how the combination of these projects will strengthen business foundations and contribute to earnings is an issue. He feels that a clear presentation of the direction in which the Company should proceed, as well as an overview of the projects it is tackling, would enhance the Company's ability to unify stakeholders and drive initiatives forward. "The NYK Group's technology strategies are directly linked to the Company's growth strategies. In fiscal 2024, the Technical Headquarters will take up the challenge of visualizing and presenting overall technology strategies in easy-to-understand ways."

Let us envision and look forward to the technological strategies and the future that lie beyond our steady day-to-day efforts.

\*1 NIBIKI (NYK's innovative Business information and Know-how initiative) is a common platform that digitalizes application and approval procedures within a safety management system. By simply following instructions and entering information in prescribed forms, crew members can submit reports or apply for approvals in compliance with the correct procedures. Through a system that automatically records and shares this information, reporting duties can be performed promptly and accurately.

\*2 SHINRAI (Sustainable Hyperintelligent initiative by NYK for Risk profiling and Assurance Integrated system) quantitatively evaluates ships and ship management companies and monitors trends based on information obtained from NIBIKI, Port State Control (PSC) inspections, NAV9000 assessments, and other sources. By automatically collecting data, the system enables timely quantitative assessments as well as the use of data for trend monitoring and assessment and other measures that promote safe ship operations.



# Our Technological Capabilities for Co-Creating Value Required for the Future

## ▶ Concentrating the Diverse Technological Capabilities of the NYK Group

Ship-related technologies need not only to be developed but also refined to a point that ultimately enables safe ship operations by employees at sea and onshore. For this reason, real frontline ship operation expertise needs to be incorporated into the technology development stage, and that is why the NYK Group has developed diverse technologies organically, both at the Company and at Group companies rather than relying on outsourcing or M&A. By reforming and reorganizing these technologies and combining them with the expertise of external partners, we will accelerate the resolution of social issues, the evolution of new businesses, and the advancement of existing core businesses.



Note: The companies presented here are Group companies overseen by the Technical Headquarters, in which NYK is the largest shareholder.

**SPECIAL FEATURE**

**Our Technological Capabilities  
for Co-Creating Value Required for the Future**



# Ammonia-Fueled Vessel to Increase the NYK Group's Corporate Value and Create Social Value

The NYK Group is currently promoting a range of initiatives, having declared its intention to achieve net-zero greenhouse gas (GHG) emissions by 2050. One of these initiatives is the ammonia-fueled medium gas carrier (AFMGC), which is to be delivered in 2026. The development and social implementation of the world's first AFMGC will be a significant pillar of the Group's GHG emissions reduction and corporate value enhancement going forward. Moreover, it is expected to drive decarbonization of the maritime shipping sector while revitalizing Japan's maritime industry.

## Importance of Co-Creation for the Wider Adoption of Ammonia

The majority of demand for ammonia has conventionally been for use as a chemical raw material for fertilizer and other applications. However, due to its characteristic of not emitting CO<sub>2</sub> when combusted, expectations are rising for the use of ammonia in new fields such as a next-generation fuel for shipping and thermal power generation and as a hydrogen carrier.\* The Group has focused on ammonia as a solution to reduce GHG emissions in the maritime shipping sector and has been developing an AFMGC.

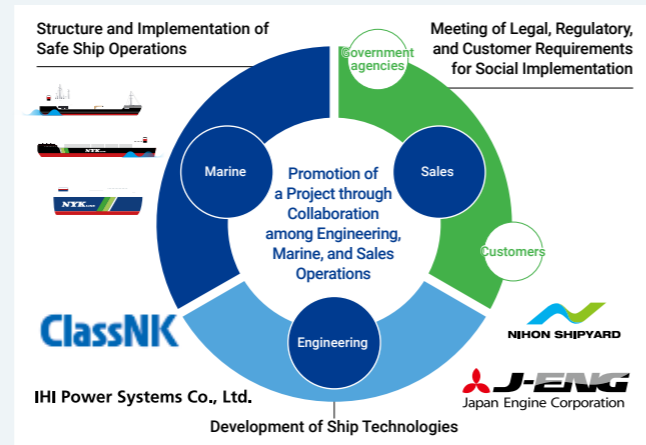
However, as there is no precedent for the use of ammonia as a marine fuel, the development itself is a world first. There is also no ammonia-fueled engine or prototype of an AFMGC. In addition, ammonia has the characteristics of being toxic, corrosive, and flame-retardant. To overcome these challenges and create a completely new vessel and engine, it was essential to collaborate with partner companies. Furthermore, beyond the physical elements of a vessel and engine, the project also requires the development of non-physical elements for safe operation. We are also expected to contribute to the establishment of international rules to support the wider adoption and expansion of ammonia-fueled vessels, which has required collaboration with government agencies.

## A Co-Creation Project through Collaboration among Engineering, Marine, and Sales Operations

To overcome these challenges, the Company is promoting a project undertaken by a team made up of members from across different professional fields that integrates engineering, marine and sales operations. The Technical Group, made up of naval architects, led the effort to develop the hull and engine, working together with partner shipyards and engine makers. In parallel, the Marine Group, comprising ship operation specialists, provided advice for safety specifications for safe operations and the creation of an operation manual. The Ammonia Fueled Vessel Development Team, in charge of sales, had the role of working on legal and regulatory compliance with government agencies and dealing with customers and others to assist the social implementation of the AFMGC developed with partner companies.

Ammonia-fueled vessels have drawn attention in various fields, and while there are high expectations for them from society, there are also

risks that come with using a new fuel. We have been addressing and resolving all manner of risks and challenges by combining diverse knowledge across different professions, companies, and industries. Through this unprecedented co-creation effort, we aim to achieve social implementation of a safe, secure AFMGC vessel.



## Enhancement of Corporate Value through Co-Creation

The AFMGC development project has involved an unprecedented number of diverse participants, which has had the effect of promoting the creation and development of new networks, particularly with partner companies. Such effects are the embodiment of the kind of co-creation that the NYK Group is aiming for. We believe they will form the foundation for new exploration going forward.

In addition, in this project the assigned personnel are engaged in numerous multifaceted discussions that range beyond their own fields of specialization, making it an excellent opportunity to develop human resources who can lead the exploration of new businesses.

Numerous hurdles remain to be overcome to realize social implementation of AFMGCs, and we are steadily carrying out testing and development. As pioneers in ammonia-fueled vessels, the NYK Group and its partners aim to enhance their corporate value by establishing a competitive advantage, while also creating social value in the form of a reduction in GHG emissions in the maritime shipping sector and the revitalization of Japan's maritime industry.

\* Substances that convert hydrogen into a state that is more manageable for transporting and substances containing hydrogen that can be efficiently transported.

## Leading Social Discussion and Accelerating Co-Creation for Implementation

The NYK Group is currently working to develop new technologies that have not existed in society before. Implementing these technologies requires not only technology development but also construction of social systems that enable participation by various stakeholders. It is important to increase the number of partners in our project and overcome challenges through various negotiations, such as aligning interests that include ship operation rules and safety standards.

Through proactive information dissemination, the Group has sought to draw attention to the advanced nature of its initiatives and the high level of its technological knowledge, and to lead the discussion through worldwide consultations, leveraging strong centrifugal force to invigorate co-creation and collaboration, including on global rulemaking. Through these initiatives, we are building the foundations for the Group's future and ultimately aim to contribute to the growth of Japan as a maritime nation.

### Recent Initiatives

#### Proactive Information Dissemination and Proposals for Issues

##### Exhibiting and Speaking at International Events

###### Panel Discussion at a COP28 Side Event

We spoke about the need for investment in the production of alternative fuels and collaboration throughout the entire supply chain, and initiatives for decarbonization, such as hydrogen strategies, as well as the current status and other topics.



###### Others

- Gastech 2023
- Sea Japan 2024
- Asia and the Pacific Transport Forum held by the Asian Development Bank, etc.

##### Explanation and Discussion with Overseas Governments and Institutions

###### Meeting with Members of the German Parliament

Members of the German Committee on Transport sought to exchange information with NYK. We had a discussion about NYK's decarbonization strategies and the status of the ammonia fuel-related project.



###### Others

- Meeting on Climate Change and Gender Equality with the executive director of the UN Global Compact
- Exchange of opinions with the Norwegian prime minister and accompanying delegates
- Exchange of opinions with members of the Finnish Parliament

#### Acceleration of Constructive Discussions

##### Participation in Shipping Industry Rule-making

###### Support for the Japanese Government in Discussion at the International Maritime Organization

NYK Group companies participated in a discussion at the Maritime Safety Committee (MSC) of the International Maritime Organization (IMO) regarding the establishment of rules for autonomous ships to provide technical expertise for supporting the relevant government agency participating as the representative of Japan. We also have discussion with the Ministry of Land, Transport and Tourism and other relevant government departments beforehand in order to consolidate our opinions.

##### Participation in a Consortium and an NPO

###### Smart Freight Centre

The Company became a member of the international NPO Smart Freight Centre, which aims to reduce greenhouse gas emissions in the logistics sector.



###### North Pacific Green Corridor Consortium

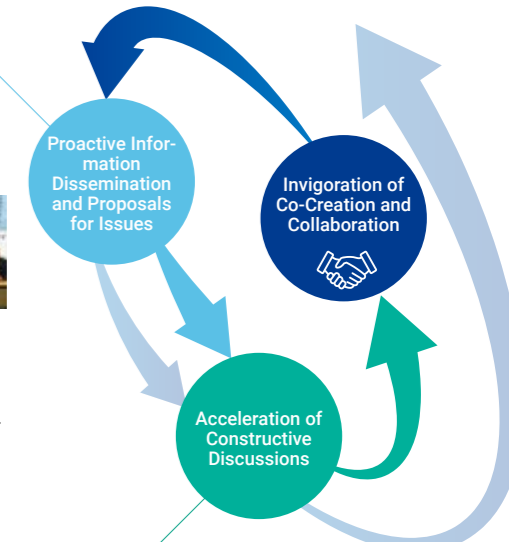
NYK Bulk & Projects Carriers Ltd., an NYK Group company, participated as a core member in the non-profit consortium, which aims to decarbonize supply chains in Canada, Japan, and South Korea.



##### Increasing Discussions with Major Maritime Shipping Countries

###### Signing of an MOU with the Maritime and Port Authority of Singapore

The agreement covers cooperation on various initiatives including the use of clean ammonia fuel as marine fuel, digital transformation, and the development of maritime personnel.



### Voice



**Minoru Matsubara**  
Chief Sustainability Officer,  
Managing Executive Officer  
Responsible Investment Division  
Resona Asset Management  
Co., Ltd.

#### Focus Points in the NYK Group's Initiatives and Expectations for the Future

The NYK Group's Vision has been articulated as "We go beyond the scope of a comprehensive global logistics enterprise to co-create value required for the future by advancing our core business and growing new ones."

When proclaiming a vision and forging a path forward, it is important to not only follow the rules but also change them for the better. Amid dramatic changes in society and the economic situation, in order to develop the NYK Group and society under the Vision with Integrity, Innovation, and Intensity (= Value), the Group must not only forge a path in accordance with the rules

but also make the rules and demonstrate the ability to lead even more than before. At a meeting with the Minister of the Environment at COP28 Dubai, I was very impressed by the NYK's powerful message for rulemaking and felt that it showed a high level of leadership ability.

The NYK Group's Mission, "Bringing value to life," shows its dedication to the value the Group brings to all living things and the environment while realizing prosperous lives and daily fulfillment for people around the world. I hope to see the NYK Group involve a large number of companies and stakeholders and exercise leadership from a higher perspective.