

Efforts Related to “Innovation Endorsement”

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1. INTRODUCTION

Accompanying progress in information technology, innovative initiatives have begun in a variety of fields, such as the automobile industry and the logistics industry. The maritime industry has also already started diverse efforts, exemplified by transfer of various types of data from ships to shore for condition-based monitoring of equipment and analysis of voyage optimization.

The main purpose of these efforts has so far included improvement in competitiveness for business efficiency, reduction in operation costs, and the creation of new data-driven value. However, addressing the issue of sustainable development has also become an additional motive force for innovation in recent years.

The Sustainable Development Goals (SDGs) laid out by the United Nations set 17 individual goals, including poverty, energy, growth, employment, climate change and marine resources. These SDGs define the future as the world should be in 2030, and are an image of the future which is supported by a global consensus. Realizing the SDGs will require new methods that might be different from the conventional procedures, including the use of information technology. It is not difficult to imagine that these kinds of innovations will give birth to new ideas that lead to a wider range of advances in the future.

Until now, classification societies have contributed to securing safety at sea and protecting the marine environment by evaluating whether ships comply with classification rules, international conventions, etc. Because classification societies possess this wealth of experience as third-party organizations, groups that are promoting innovation have called for certification and evaluation to further promote these efforts; however the lack of clear evaluation standards prevented us from fully meeting the needs.

With the aim of providing greater support for revitalization of the maritime industry and its surrounding industries, including initiatives for innovation, ClassNK announced the “ClassNK Digital Grand Design 2030,” which describes the roles that may be required of classification societies around the year 2030. As part of efforts to realize this vision, we have launched a new set of services called “Innovation Endorsement” for certification of innovative technologies and initiatives.

This article focuses on our efforts related to “Innovation Endorsement.”

2. CLASSNK DIGITAL GRAND DESIGN 2030

In innovative initiatives responding to advances in information technology and sustainable development, the creation of unprecedented value through collaboration among different players has begun, and the new players not bound by the conventional frameworks of individual companies have started to emerge.

Until now, ClassNK has supported the maritime industry to fairly and smoothly function by contributing to protection of the environment and human life, largely centering on three client groups: the shipbuilding industry, the maritime shipping industry and the insurance industry. However, the maritime industry has been going through a change with the number of new players such as the system integrators and digital forwarders increasing. As a result, the roles of each player in the maritime industry is assumed to change accordingly, resulting in that classification societies ourselves must also change in line with this dynamic industrial structure.

Therefore, based on the forecast of structural changes in the maritime industry by around 2030, ClassNK announced the “ClassNK Digital Grand Design 2030” in February of 2020, schematically summarizing new needs in digital transformation, the roles that may be expected of ship classification societies, and the contribution and services which this ClassNK should be provide in the maritime field and surrounding fields (Figure 1).

Specifically, to achieve the concept of “Creating Innovation for a Blue Economy,” the Digital Grand Design presents three

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roles which should be developed in the future along the axis of the conventional classification business: “Advanced surveys,” “Creating a progressive business environment”, and “3rd party certification, evaluation and rating.”



Figure 1 ClassNK Digital Grand Design 2030

3. OVERVIEW OF “INNOVATION ENDORSEMENT”

With all companies making innovative efforts in response to the progress of information technology and to the issue of sustainable development, there is a heightened need for 3rd party certification of data of these technologies and efforts as well as ships that utilize the certification to emphasize diffusion and distinctiveness from other companies.

To meet this demand, ClassNK began a new certification scheme called “Innovation Endorsement,” as shown schematically in Figure 2.

Since proactive development of a certification service for innovative initiatives and the promotion of its popularization and growth will lead to further improvements in protection of the marine environment and safety at sea, and will also support sustainable development, it can be said that this is an effort by a certification organization to create new value based on “3rd party certification, evaluation and rating,” as proposed in the above-mentioned “ClassNK Digital Grand Design 2030.”



Figure 2 Schematic concept of Innovation Endorsement

Because innovative initiatives are the target of certification under the Innovation Endorsement program, the basic policy of this program was established as follows.

- Speed-focused: Since innovations progress rapidly, ClassNK will construct evaluation techniques and provide 3rd party certification services that prioritize speed synchronized to the pace of innovations.

- Cooperation with front-runners: In many cases, no evaluation criteria have been established for innovative efforts. Therefore, ClassNK will study and establish evaluation criteria in cooperation with front-runners who are the pioneers of innovative technologies.
- Certification required by clients and society: ClassNK will progressively expand the targets and the scopes of certification of innovative efforts based on clients’ requests and social conditions.

The target scope of certification is 4+1, that is, “Digital,” “Green,” “Safety,” “Labor” and “Yours.” In particular, “Yours” means addressing issues, requested for certifications by clients and society, that do not fit in any of the other four categories. When the Innovation Endorsement program was originally launched, the focus was innovative efforts utilizing digital technologies. However, since some efforts related to sustainable development do not necessarily utilize advanced digital technologies, “Green,” “Safety” and “Labor” were added to provide a scope of certification based on the purposes of innovations.

Concretely, the Innovation Endorsement program consists of three types of certification services which are performed individually: Notation service for ships, certification for Products & Solutions such as software and equipment, and certification for Providers of products and solutions. The following presents overviews of these three categories.

3.1 Notation Service

The object of certification is ships. The notations “DSS (Digital Smart Ship)” and “a-EA (advanced Environmental Awareness)” are added to the character of classification of ships that have made digitization initiatives and environmental initiatives. By including this information in the ship’s classification certificate, this service supports enhancement of added value of ships.

3.1.1 Digital Smart Ship

This is a service which certifies ships that have introduced innovations utilizing digital technology by adding the Digital Smart Ship Notation (abbreviated DSS) to the ship’s character of classification. The related guidelines, “Guidelines for Digital Smart Ships (First Edition)” were released at the end of August 2020.

The service specifies a framework for the notations for ship equipment and functions utilizing innovative technologies, which purpose is to support the introduction of innovative technologies and enhancement of added value of ships.

It is possible to add multiple symbols to the character of classification at once. To add symbols, ClassNK examines drawings and inspection records, and also conducts maintenance survey to confirm that the innovation has been put into operation and is being maintained.

In efforts related to innovative technologies, divisions of the levels of notation are also defined, assuming that more advanced technologies may be used in the future, even in functions for the same purpose, accompanying the progress of technology.

The current most recent edition, “Guidelines for Digital Smart Ships, Second Edition” (released in May 2021) includes the 10 items shown in Table 1 as innovations for which symbols will be added in the DSS Notation. For example, the Notation DSS(EF) for “energy efficiency” is added if a ship is equipped with a function that analyzes the operation data of the ship and uses the results to optimize fuel consumption on the next voyage.

Table 1 List of DSS Notation items

Item	Abbreviation	Outline
Energy Efficiency	EE	Fuel optimization
Hull Monitoring	HM	Hull monitoring
Sloshing	SLOSH	Sloshing detection
Machinery Monitoring	MM	Machinery condition-based monitoring (CBM)
Connected Ship	CNS	Onboard server, infrastructure, <i>etc.</i>
Navigation	NAV	Autonomous navigation equipment, <i>etc.</i>
Shore Monitoring	SM	Shore monitoring of equipment
Onboard Local Area Network	LAN	Onboard network
Refrigerated Cargo Shore Monitoring	RGSM	Shore monitoring of refrigerated cargos
Emission Shore Monitoring	ESM	Shore monitoring of emissions

Since various players are promoting innovations by diverse methods, DSS Notation items have been added in line with this trend. In the future as well, ClassNK plans to flexibly expand the items that can be added to the DSS Notation based on the needs of clients and conditions in the industry.

As of the end of May 2020, DSS Notations had been registered for about 70 ships.

3.1.2 Advanced Environmental Awareness

In 2009, ClassNK published an “Environmental Guideline” for addition of Environmental Awareness Notation (abbreviation: EA Notation) for ships that have introduced environmental technologies outperforming the requirements set out in international conventions.

With heightened awareness of Corporate Social Responsibility (CSR) and efforts to achieve the Sustainable Development Goals (SDGs), there have also been increasing efforts to voluntarily promote environmental technology beyond the framework of international conventions.

In order to support innovative efforts in connection with environmental countermeasures more quickly, the concept of “Innovation Endorsement” was incorporated in the Guideline from the Fourth Edition (May 2021), and this was added a “Client’s viewpoint” oriented service.

In this guideline, an Advanced Environmental Awareness Notation (abbreviated a-EA) is to be added to the list of notifications for ships that have made advanced environmental conservation efforts that go beyond the framework of international conventions and regulations.

In the 4th edition of the Environmental Guidelines, the seven initiatives that can be marked with Notation in the a-EA are listed in Table 2.

For example, a ship equipped with a bottom air lubrication system to improve propulsion performance will be marked with the Advanced Environmental Awareness (AIR LUBRICATION SYSTEM) abbreviation: a-EA (ALS) Notation.

Table 2 List of a-EA Notation items

Category 1	Category 2	Marks	Item
Air pollution Prevention	Reduction in Greenhouse Gas Emissions	SCELL-(PA)	Adoption of Solar Cell
		FCELL-(PA)	Adoption of Fuel Cell
		WINDG-(PA)	Adoption of Wind Generator
		ORCWHR-(PA)	Adoption of Wave Heat Recovery System with Low-Boiling Medium such as Organic Rankine Cycle Generator System
		EGWHR-(PA)	Adoption of Exhaust Gas Waste Heat Recovery System
Others	Propulsion Performance	ALS	Provision of Bottom Air Lubrication Systems
		ESA	Adoption of Energy Saving Additives

As is the case of the DSS Notation, efforts in connection with these environmental countermeasures are being promoted by diverse methods, so that ClassNK plans to continue expanding Advanced Environmental Awareness items quickly and flexibly based on the needs of clients and conditions in the industry.

3.2 Products & Solutions Certification

Products & Solutions certification is to promote the diffusion and further development of excellent products and solutions.

Among advanced products utilizing cutting-edge technologies, in this service, ClassNK issues certificates for functions for which the company developing a product requests 3rd party certification from the viewpoints of technical validity and safety, utilizing its know-how as a ship classification society to date.

In the future stage when we have collected results of certification for a number of similar solutions, we plan to document the evaluation criteria and evaluation procedures more concretely and develop guidelines for public release so as to heighten the transparency of certification. For example, we may collect results of certification for condition-based monitoring (CBM) solutions for engines.

The Products & Solutions certificate is truly a “fully-customizable” certificate. The certification process begins when

ClassNK receives a proposal by an applicant about “what” should be certified. This “what” will be listed as the “Product Description” in the certificate issued by ClassNK. Since there are no evaluation criteria for these proposed advanced functions in many cases, ClassNK studies the evaluation criteria together with the applicant, also utilizing its experience as a ship classification society until now. For example, in case the function of “remote monitoring” is to be certified, the items that should be confirmed for “remote monitoring” are decided through consultation in the certification process.

The certificate is then issued after a review of the manuals, specifications and other product documents related to the confirmation items and confirmation of operation.

As of the end of May 2021, issuance of 4 certificates had been completed, and ClassNK had received inquiries concerning about 20 products from Japan and other countries.

3.3 Provider Certification

Provider certification is a certification service that targets the initiatives and business models of companies.

The service aims for a “new form” of certification which supports enhancement of stakeholders’ mutual trust by 3rd party certification of innovation activities of organizations for target achievement in line with the SDGs and ESG (Environmental, Social and Governance) investing. To make the fullest possible use of certification as an immediately effective tool, ClassNK is examining certification in the following three classes.

In all stages of certification, the activities and results of the innovation-generating organizations are verified from the perspective of the management system.

- Class C: Certification of the concept of the organization that intends to implement innovation. We will examine verification of the policy, planning and organizing of innovation, e.g. "matrix of business activities," "two-story innovation management," "open innovation," etc.
- Class D: Certification of the ability of an organization with a Class C certificate to implement innovation. We will use specific examples to verify that innovation is carried out using the methods and tools necessary to the implementation of innovative activities. Examples are the "innovation compass", the "stage-gate method" and the "knowledge creation process," to name a few.
- Class S: It certifies that an organization with D level certification has implemented innovation and that the outcomes have been implemented in the business. It verifies that the organization has implemented innovation in a sustainable manner, for example in accordance with ISO 56002 guidelines.



Figure 3 Framework of Innovation management system (images)

4. FUTURE DEVELOPMENT

As described above, the Innovation Endorsement program consists of 3 individual certifications services for the targets of

certification, a Notation service, Products & Solutions certification, and Provider certification.

In the future, ClassNK plans to provide certification not only for methods and functions of utilizing innovative technologies but also for the client's effort itself.

For example, we are considering certifying the results of efforts related to ESG investing by companies, such as fuel consumption reduction results obtained by energy-saving technology and the length of downtime reduction achieved by condition monitoring technology (CBM etc.).

Since it is imperative to do indexing based on various evaluation axes for the certification of these results, we consider it necessary to have the consultation with all players including discussion on the feasibility.

5. CONCLUSION

“ClassNK Digital Grand Design 2030” mentions “3rd party certification, evaluation and rating” as one core business. In line with this, ClassNK began “Innovation Endorsement” to provide the tangible services, considering that one of the biggest roles that ship classification societies should play around 2030 is support for innovative technology and initiatives.

At present, Innovation Endorsement provides three certification services covering Notation, Products & Solutions and Providers, with a scope that includes use of digital technologies, protection of the environment, safety at sea and labor. In the future, Innovation Endorsement will also expand the scope of certification flexibly based on the new requests from clients and the change in social conditions.

Through Innovation Endorsement, ClassNK will proactively develop the new certification services demanded by clients and the industry, while continuing to utilize its knowledge as a ship classification society, in order to support the activities of Clients that aim for sustainable development through advanced initiatives.