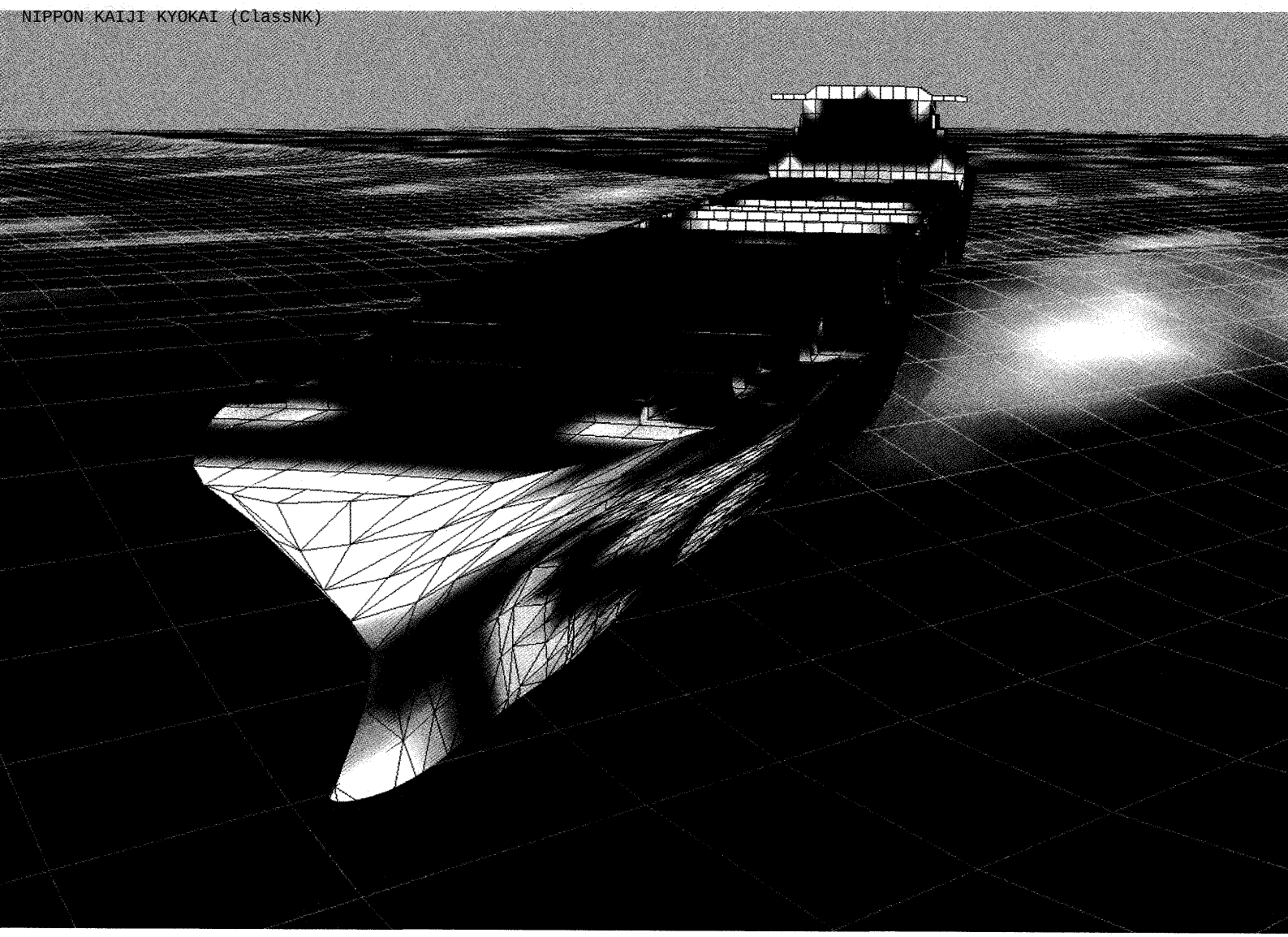


Special Article

PrimeShip – Total Ship Care

1. Introduction

ClassNK celebrated its 110th year of service in 2009, and has been engaged in classification services over this long period with the cooperation of maritime related industries. In its continuing efforts to provide the maritime industry with the latest and best technical services aimed at ensuring the overall safety of ships and to conserve the marine environment, with the aim of capitalizing on the abundant technical expertise and data it has accumulated through its long history of classification service. These technical services are further upgraded, enhanced, and organized under the name "PrimeShip" into an integrated and comprehensive suite of services. That is, "PrimeShip" is the collective name of various individual service groups offered to customers, and precedes the name of each specialized service in each group.

As a ship classification society, ClassNK cooperates closely with all facets of the maritime industry to prevent pollution of the marine environment and promote the safety of ships over their entire lifetime from design to dismantling. The PrimeShip suite of services offers technical services to ensure the comprehensive safety and reliability of ships at every stage of a ship's life from inception and design through construction, operation, management, maintenance, and related activities until it is scrapped, based on the concept of "Total Ship Care," so that the

latest technical services are always offered through various stages of the ship's life.

2. History of PrimeShip

ClassNK announced the addition of the class notation DATA (Design by Application of Total Analysis concept) in 1994. This notation is assigned to those ships for which structural analyses are carried out based on the wave load calculations for that ship, and scantlings of the hull structural members are determined based on the concept of "Design by Analysis". This concept requires the provision of a series of evaluation software applications.

At that time, the Society had developed software on the premise that it was mainly for in-house use, and offered external services solely when calculations were requested. With the announcement of DATA and the advent of compact and high speed computers, the software applications that had been used in-house until then were modified to facilitate use by external users, and new software applications began to be developed specifically for external use.

To further promote such services offering software applications, the conventional calculation services that were performed on request, along with other technical support and information services were integrated under the name "PrimeShip" in 1995 and offered for external use.

Initially, information technology formed the base that totally supported PrimeShip. Various other information services offered that used these technologies were also considered a part of PrimeShip. However, with advancements in data communications technology, "information services" came to comprise separate important components, and in 1997, PrimeShip came to be limited to pure "technical services" such as software services, calculation services, and technical support services.

Later, various new services continued to be offered capitalizing on the results of various R&D activities and related technical advances made in response to the needs of maritime related industries, so that by 2008 there were as many as 29 services (of which four are under still under development) comprising PrimeShip technical services.

The various services under the PrimeShip umbrella were reviewed, resulting in some services being integrated into the PrimeShip suite and others being discarded in 2009, with the aim of facilitating the use of the entire suite and making it easy to understand for users. The result is that today PrimeShip consists of four groups and fourteen services, as shown in Fig. 1.

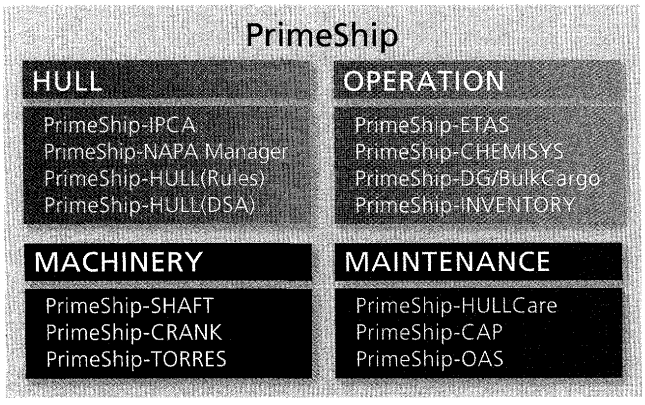


Fig. 1 Composition of PrimeShip services.

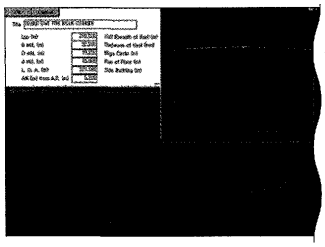
3. Various services constituting PrimeShip

PrimeShip is constantly being updated based on the results of the latest technological advances and R&D activities of the Society. These services enable improved, for instance, reliability and enhanced efficiency of hull structural analysis, labor savings during various kinds of design work, faster preparation of loading plans and maintenance plans of ships in service, and so on.

3.1 HULL Group

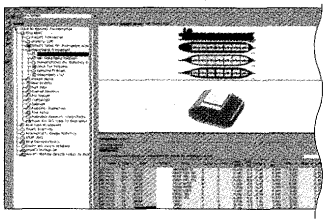
The HULL group is used as a support for the examination of hull plans, and consists of four software services. It supports the design of hull structures and hull performance, and contributes to higher efficiency during design, thereby leading to the safe and efficient design of ships.

■ **PrimeShip-IPCA:**



PrimeShip-IPCA (Integrated Program for Determining Ship Performance Capability) is a Windows-based program developed by ClassNK for determining trim, stability, longitudinal strength, freeboard, grain heeling moment, and other similar factors related to ship performance capability.

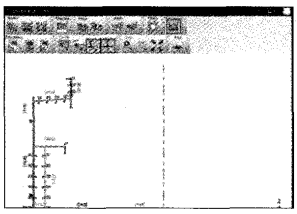
■ PrimeShip-NAPA Manager:

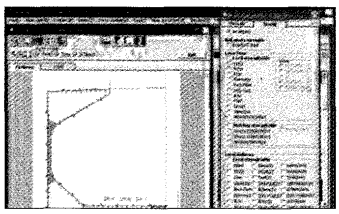


This program is an application tool developed by customizing the ship performance calculation system NAPA for ships classed by the Society. NAPA (Naval Architectural PAckage) boasts a sizable worldwide market share. PrimeShip-NAPA Manager can be used to carry out statutory compliance calculations on NAPA 3D models, as well as to create intact/damage stability booklets and loading manuals.

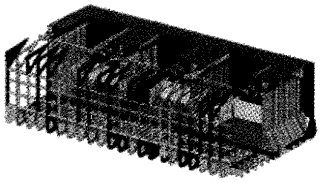
■ PrimeShip-HULL(Rules):

This system is a rule calculation software suite with an excellent user interface. This free software allows ship designers to quickly calculate the requirements for structural members in accordance with the IACS Common Structural Rules (CSR) and Part C of the ClassNK Rules for the Survey and Construction of Steel Ships.





■ PrimeShip-HULL(DSA):



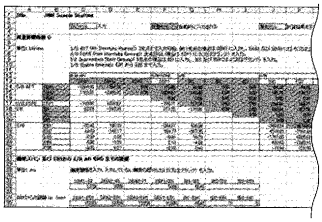
PrimeShip-HULL(DSA) (Direct Strength Assessment System) is a specialized software program excellent for performing direct strength calculations of ship structures in accordance with ClassNK Rules and the IACS CSR. It helps make ship design an easy and efficient process by allowing users to quickly conduct complicated structural strength analysis for a wide variety of loading conditions.

3.2 Machinery Group

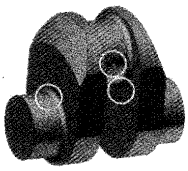
The following three services are come under the Machinery Group that supports the efficient design of machinery:

■ PrimeShip-SHAFT:

PrimeShip-SHAFT is a calculation program based on ClassNK's "Shaft Alignment Design Guidelines" that reflects the results of new research and in-depth analysis of machinery damage. The program enables quick determination of optimum bearing positioning and shafting alignment.

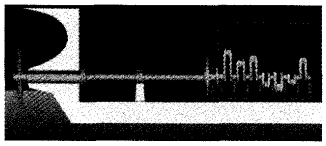


■ PrimeShip-CRANK:



PrimeShip-CRANK is a crank shaft stress calculation service designed to evaluate the strength diesel engine crankshafts in accordance with ClassNK Rules and relevant IACS Unified Requirements.

■ PrimeShip-TORRES:



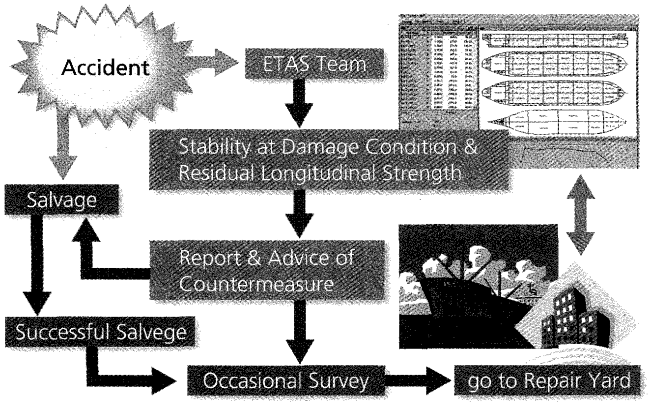
PrimeShip-TORRES is an analysis service used for evaluating torsional vibration items indispensable for efficient design of shafting system, such as critical rpm, carried out after performing vibration response analysis of the machinery shafting system.

3.3 Operation Group

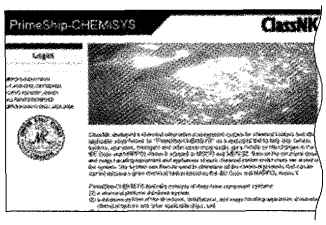
The Operation Group of services support various operations after a ship enters service and consists of one technical support service and three software services. This group of services not only supports safe operation of ships but also offers support for loading plan proposals, and other important functions.

■ PrimeShip-ETAS:

PrimeShip-ETAS is an emergency technical support service designed to help ship owners and operators ensure ship safety and prevent or minimize the effect of marine pollution in the event of a serious ship casualty such as stranding, collision or explosion.

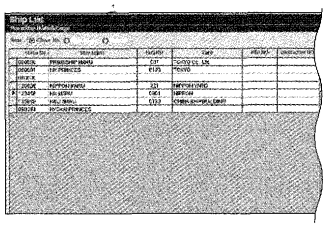


■ PrimeShip-CHEMISYS:



PrimeShip-CHEMISYS is a convenient and powerful tool for use in the design and operation of chemical carriers that offers comprehensive support to designers as well as ship owners and managers from the design stage to operation during the service life of chemical tankers.

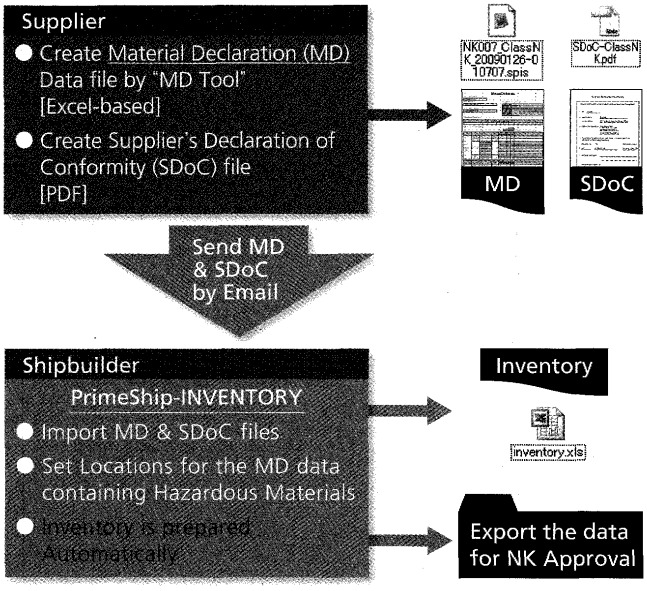
■ PrimeShip-DG / BulkCargo:



This is a program that judges cargo that can be loaded on a ship based on relevant requirements relating to the carriage of dangerous substances and solid bulk cargoes taking into account the construction and equipment of the ship.

■ PrimeShip-INVENTORY:

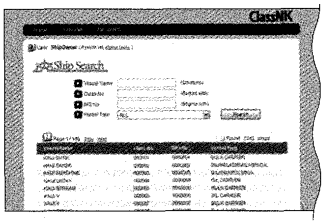
PrimeShip-INVENTORY is a program that can used to electronically prepare and manage the inventory of toxic substances required by the Ship Recycling Convention.



3.4 Maintenance Group

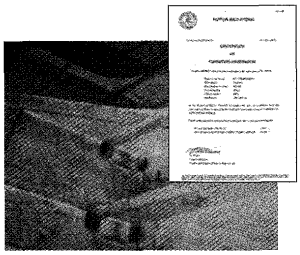
The Maintenance Group of PrimeShip services supports the maintenance of ships by providing a range of tools that can help ship managers effectively prepare and implement ship maintenance and repair plans.

■ PrimeShip-HULLCare:



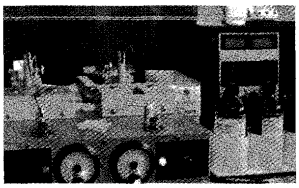
PrimeShip-HULLCare is an information service that provides useful ship maintenance information for each ship after organizing and categorizing the enormous volumes of survey data accumulated from various NK survey offices across the globe.

■ PrimeShip-CAP:



PrimeShip-CAP (Condition Assessment Program) is a condition assessment service for certifying and documenting the condition of aging vessels that goes beyond the scope of regular classification and statutory regulations.

■ PrimeShip-OAS:



PrimeShip-OAS is a fuel oil analysis service based on JIS or ISO standards, as well as a stern tube lubricant analysis service carried out as part of Propeller Shaft Condition Monitoring.

4. The Future of PrimeShip

As described above, the latest technical services are offered by ClassNK based on advanced technical expertise and abundant data acquired over more than a century of service to the global maritime industry under the name of PrimeShip.

New services will continue to be offered appropriately henceforth considering maritime needs, and continual R&D activities will be conduced so as to give solid support for assisting ship designers, builders, owners and mangers ensure the overall safety of their ships through their entire life times as well as for contributing to preservation of the marine environment. Watch out for further developments in PrimeShip in the future.