



ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ

ΣΧΟΛΗ ΘΕΤΙΚΩΝ ΕΠΙΣΤΗΜΩΝ

**ΔΙΑΤΜΗΜΑΤΙΚΟ ΜΕΤΑΠΤΥΧΙΑΚΟ ΠΡΟΓΡΑΜΜΑ ΠΛΗΡΟΦΟΡΙΚΗ
ΚΑΙ ΥΠΟΛΟΓΙΣΤΙΚΗ ΒΙΟΙΑΤΡΙΚΗ**

ΚΑΤΕΥΘΥΝΣΗ

**«ΠΛΗΡΟΦΟΡΙΚΗ ΜΕ ΕΦΑΡΜΟΓΕΣ ΣΤΗΝ ΑΣΦΑΛΕΙΑ, ΔΙΑΧΕΙΡΙΣΗ
ΜΕΓΑΛΟΥ ΟΓΚΟΥ ΔΕΔΟΜΕΝΩΝ ΚΑΙ ΠΡΟΣΟΜΟΙΩΣΗ»**

ΜΑΘΗΜΑ: ΝΑΥΤΙΛΙΑΚΗ ΠΛΗΡΟΦΟΡΙΚΗ - MARITIME INFORMATION SYSTEMS

**ΕΡΓΑΣΙΑ – Αναφορά σε ναυτιλιακά προγράμματα
των εταιρειών DANAOS, ABS, DNV
και Ulysses Systems**

ΜΤΠΧ – ΡΟΗ ΠΛΗΡΟΦΟΡΙΚΗΣ

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Referring to programs of DANAOS, ABS, DNV and ULYSSES SYSTEMS for shipping companies

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Abstract—A presentation of Computer Programs of DANAOS, ABS, DNV and ULYSSES SYSTEMS which are very useful in shipping companies.

Keywords— DANAOS; ABS; DNV; ULYSSES SYSTEMS; programs; shipping companies.

I. DANAOS WEB ENTERPRISE SUITE

Designed, Built and Launched using state-of-the-art technologies and supplemented by professional outsourcing, implementation, support and training services, Danaos offers the most complete A-to-Z maritime software and services. Danaos Maritime Software Solutions automate all the daily functions of any shipping company, providing a high return on investment (ROI) and tangible benefits.

Combining comprehensive maritime domain knowledge with advanced technology expertise, Danaos provides maritime software solutions for the shipowner, shipmanager, broker, operator, charterer or accountant. Danaos Software Solutions bundled with our Services encompass the full spectrum of the shipping industry processes, addressing all daily challenges, either as stand-alone applications or as a scalable, agile, secure, web-enabled and fully integrated suite of modules.

A. FINANCIAL SUITE

B. COMMERCIAL SUITE

C. SHIP MANAGEMENT SUITE

All modules of each software application have been designed under the same concept and they offer the same user interface. Modules process information from one department to another, if that is required. The linkage between the modules can be progressive to support initial stages. This structure offers your company the potential to activate the system progressively, according to its requirements.

With the selection of any Suite's Module installation, foundation modules are a prerequisite. Installed foundation

modules create part of the administration panel providing low level interconnectivity and functionality:

Foundation Module	Description of Functionality
Address Book	Auto-insert and catalogue existing address book entries into the system, populating associated list boxes.
Vessels	Auto-insert and catalogue existing vessel entries into the system, populating associated list boxes.
Data Admin Modules (STY)	Identity and access management for users and groups creation and setup. Users register, log in, and log out based in permissions that extend to enterprise Single Sign-On Manager based on organizational roles and policies.
DBA Admin	Fine tune the performance, integrity and security of a database. Troubleshoot and resolve synchronization, updating and backup issues.
Exchange Rates	Exchange Rates is an easy to use application and contains all necessary utilities to record, access and maintain historical and actual exchange rates.
KPI	Create Alerts, Setup Warnings and Design Standard Reports/Dashboards for each entity and attribute.
SPI	Arranged in a hierarchical structure, SPI provides the necessary administrative functionality to define system parameters.

Security mechanism, User Roles and Access Rights

Danaos Web Enterprise Suite has been designed to meet the IEEE security requirements in respect of functional permissions and information access permissions. All

functional permissions are maintained from the fleet management system while the information access permissions are maintained in the database level. This way the user can access only the information based on the database rights no matter what tool he/she may use. Regarding the functions within the applications they are restricted to specific roles. Every user may be assigned one or more roles.

This way security requirements are maintained consistently in a quality and user friendly manner. [1]

A. FINANCIAL SUITE

Shipping, as a capital intensive Asset Management Venture, requires automation of all accounting processes in order to ensure a seamless flow of critical financial data, across departments. Today, Danaos Financial Suite is installed in more than 500 companies worldwide (18 Nasdaq-listed) providing advanced reporting and auditability.

Visibility and control on your assets (CAPEX) and your operations (OPEX) requires a financial business solution that will provide a comprehensive, multi-business-unit monitoring and that will be fully integrated with your financial and resource management system. Danaos Financial Suite core modules are the necessary building blocks to gain full versatility in terms of Financial Management within your Organization.

Designed as a multi-Company, multi-Group and multi-Currency Accounting shipping solution, Danaos Financial Suite provides advanced Reporting functionalities, enabling consolidation throughout all corporate levels.

FINANCIAL MODULES

- 1) Marine Accounting & MIS
- 2) Budgeting System
- 3) Payments Module
- 4) Exchange Rates
- 5) Greek Accounting
- 6) Fixed Assets
- 7) Bunker Trading Financials
- 8) Financial Document Controller
- 9) Marine Claims Manager

Danaos Financial Suite is part of the Danaos Web Enterprise Suite, a comprehensive set of integrated offerings for both office and vessel.

Reporting Features and Functionalities

- Monitoring of Payable & Receivable Open Items (Outstanding reports), including Ageing Analysis reporting.
- Trial Balances with drill down ability up to the Transaction level.
- Analytical Ledger Cards with “Link” ability to the Danaos module from where the Journal Entry is created.
- User Defined Balance Sheet (Drill down to Bank Reconciliation, Accounts Receivable, Inter-companies, Accounts Payable), Statement of Income (Drill-down to Revenues, G & A Expenses, Interest Income) and Cash Flow reports with Drill-down analytical reporting.
- Voyage Specific Ledger cards independent of the financial period.
- User Defined Voyage Results reporting.
- Charterers’ balances consolidated and per Voyage [2]

1) Marine Accounting & MIS

This module is designed for multi-Company, multi-Group, multi-Currency Accounting support. Reporting is available to perform all levels of Consolidation. Novel architecture enables dynamic chart of Account definition. Support of Voyage Accounting and Analysis, Running Cost Reporting, Cash Flow Analysis including accruals. Suitable for Ship management, Ship owning, Ship holding Groups, Operators, Agents, Bunker Traders, etc.

- Monitoring journals between more than one open financial periods.
- Compatible with SOX Rules.
- The data entry screens, the report parameters, and the user defined reporting provide the user with maximum flexibility.
- Security system with user defined roles and tasks, ensures access rights for selected users.

- User Defined Chart of Accounts and ability of reorganization of accounts according to the needs of the company.
- User Defined Chart Types for further Analysis of COA
- All available reporting can be exported to Microsoft Excel for further manipulation.
- Voyage Accounting data entry and reporting is fully supported.
- Automatic calculation of Exchange Differences and Revaluation.
- Automatic creation of Inter-company Transactions.
- Automatic Calculation of Prepayments between more than one financial periods based on the allocation period of running expenses.
- Ability to scan or attach all types of documents on transactions.
- Breakdown of Running Expenses (Accruals) based on the allocation periods.
- Automatic Closing – Opening of financial period (ability of reverse procedure is available).
- Year End Closing entry per vessel/company is automatically created. [3]

2) Budgeting System

Application Software specially designed for the Accounting department of a Shipping company. Designed to support all types of calculations and the user can budget: Running Costs, Income, Profit, Financing Costs, Credit Line, Voyage Budgeting, etc. Consolidated budgeting for a group of projects or group of companies and Historic Accounting Information are included in the system. [4]

3) Payments Module

Application software specially designed for Accounting Department. Selection of Outstanding Payables due in certain period. Supports partial payments, on account payments and bank transfers. Selection of Invoices, Prepayments and Credit Notes to be included at a certain remittance. Supports Multiple banks for each Creditor for each payment currency. Automatically creates Accounting Entry. Automatically creates Remittance Advice Bank letter, Remittance Letter, Check etc. Payments module can be customised to meet

specifically your company format. Reports: Outstanding per creditor, outstandings per currency and creditor, list of outstanding items. [5]

4) Exchange Rates

Exchange Rates is an easy to use application and contains all necessary utilities to record, access and maintain historical and actual exchange rates. [6]

5) Greek Accounting

Income and Expenses module presents company financial statements according to Greek General Chart of Accounts, (2nd Category Books). Taxable companies who keep category books and file VAT returns based on the type of their business entity (Ltd-SA) leverage on the automated functionalities of this module in order to create all required financial statements and reports based on the Greek Law Requirements. Income and Expenses Module monitors and ensures compliance with the Code of Tax Reporting of Transactions (KFAS) and all relevant provisions, circulars, guidance or Ministerial Decisions that have been issued in relation to the Code of Books and Records (CBR). Greek Supplement (3rd Category Books)

Greek Supplement module presents company financial statements according to Greek General Chart of Accounts, (3rd Category Books). Taxable companies who keep category books and file VAT returns based on the type of their business entity (Ltd-SA) leverage on the automated functionalities of this module in order to create all required financial statements and reports based on the Greek Law Requirements. Income and Expenses Module monitors and ensures compliance with the Code of Tax Reporting of Transactions (KFAS) and all relevant provisions, circulars, guidance or Ministerial Decisions that have been issued in relation to the Code of Books and Records (CBR). [7]

6) Fixed Assets

Fixed Assets module is designed for registration and grouping of assets per company and installation places. Ability to create automatic Purchase entries of new assets, and increase the value of an asset. Depreciation of all assets and automatic entries to Marine Accounting module are available. This module provides all the necessary tools to manage your maritime assets' financial and tax reporting. Sophisticated depreciation features perform calculations quickly and easily. Reporting is available to print labels for each group item, and the Depreciation report for specific period that includes the previous, current and remaining amounts of each item. Vessel depreciation/amortization which depends on the remaining useful life (RUL) and the type of the vessel is inclusive. [8]

7) Bunker Trading System

Bunker Trading Financials is specially designed for the traders involved in bunkering, fuels and lubricants providing continuous on line information from suppliers involved to the agents and ship owners. The system automates invoicing and sequentially all accounting files. Apart from the follow-up of the client's payment status, the company exposure – telex – official invoices, on-line information concerning the status of bunkers deliveries, past or future payments and customer's/ supplier's exposure, is also available. The above information can be obtained by stem, supplier, broker, etc. [9]

8) Financial Document Controller

The Financial Document Controller module aims to adapt each company's internal document workflow and to optimize the procedure in a digital environment. This module automates the procedure of protocol registration assigning a unique protocol number to any incoming invoice or other official document. It also stores the scanned image of the physical document. The new document record is forwarded to each department of the company according to a predetermined workflow that is parametric and can be set (and updated) by the Administrator. Depending on the agreed process for each department, the authorization for the invoiced amount is recorded, if the document is an incoming Invoice. The module can also register the Accounting Entries (in case the document is an Invoice) where the case refers to a single Supplier Crediting, or even a complete Debit/Credit entry with the appropriate allocations to the respective cost centers, in case those actions are performing during the Protocol registration. This module is fully integrated with the other relevant Danaos applications such as Supply, Accounting, etc., and updates the incoming documents. It also has the ability to handle contracts documents. [10]

9) Marine Claims Manager

Streamline your claims handling operations with the Marine Claims Manager Module. This module is designed for registration and grouping of Claims per company. Ability to create automatic entries in Marine Accounting module, in order to amend the value of the claim (receipts/payments). Reporting is available to print the Outstanding Claims or the total history of a specific Claim. [11]

B. COMMERCIAL SUITE

Danaos Commercial Suite is the most sophisticated and popular maritime commercial software in the global market! Danaos Commercial Suite integrates seamlessly either with the Financial & Ship Management Suites or any third party Software (SAP, Microsoft Dynamics, Oracle Financials, DA's, Diabos, Q88, AtoBviaC) allowing maximum operational flexibility, supporting decision making process

and eventually adding value throughout the entire shipping organization, saving time and money.

Danaos Commercial Suite simulates fleet management system operations by linking derivative data from operations, chartering and accounting departments and providing immediate value improving access to commercial and operational performance indexes.

COMMERCIAL MODULES

- 1) Voyage/Cargo/Vessel Operations
- 2) Telegrams Report
- 3) Vessel Scheduling
- 4) Voyage Estimation/Chartering
- 5) Port Expenses (DAs)
- 6) Freight n Hire Collection
- 7) Laytime/Demurrage Calculator
- 8) Bunkering Management System
- 9) SEEMP/MRV [12]

1) Voyage/Cargo/Vessel Operations

Voyage/Cargo/Vessel Operations Module is specially designed for the operation department of a shipping company as a decision making as well as a claims support/ defense tool, providing performance monitoring in technical and financial terms with minimal information required.

Voyage/Cargo/Vessel Operations Module provides **passage speed calculation** with direct gain/loss calculation and bunkering ports and schedule with complete analysis and costs differentials.

Complete movements and daily reports with all specific and average figures. Charter party over/under performance evaluation in actual financial terms, providing complete defense against claims.

Informs management with **voyage financial reports and post voyage analysis**. Vessel Performance module is specially designed to assist the Technical department in a consistent performance calculation. Minimising required data from vessel creates dimensionless performance criteria separating, quantifying and identifying the performance degradation. Informs about vessel performance figures for each voyage leg in relation with wind, sea and current patterns. Evaluates

performance in percentage terms, for the hull propeller main and auxiliary engines. Provides complete vessel log with operational information. Full voyage and port statistics with fuel oil, diesel oil and lubricants consumption for each voyage leg, port call or during maneuvering.

Features and Functionalities

- Vessel Scheduling
- Events Scheduling
- Cargo Scheduling
- Vessel & Voyage Performance
- Charter Party Compliance
- Position Lists
- Map Movement – Position
- Owners / Charterers Contracts
- Cargoes / Ports History
- Voyage Results Actual vs Estimate
- Bunkers FIFO Calculation
- Vessel Report Viewer
- Sublet Monitoring
- Off Hire Management
- COA Management
- Voyage Instructions
- Correspondences with Masters
- Brokers & Customers for Vessels positions [13]

2) Telegrams Report

The function of inputting the daily telegrams from the vessel to the system can be outsourced to Danaos, where our data centre receive these telegrams from the client's vessel and remotely update the system within a specified time frame, allowing the client to view updated vessel positions and consumption at any point in time. [14]

3) Vessel Scheduling

The specific module monitors, manages and administers all tasks and procedural activities involved in the operations of

bulkers, tankers, containers/liners and LNG/LPG. General dashboard (see above) provides consolidated information in terms of all operations and crucial alerts, providing an overall situation awareness. Plan voyage based on C/P and voyage order is taking into consideration original chartering estimations, derived during fleet scheduling.

Generates reports or shows alerts that assist the operations department to manage 'by exception' the voyage. Real time post analysis reports.

- Vessel Scheduling
- Events Scheduling
- Cargo Scheduling
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- Voyage Instructions
- Correspondences with Masters
- Brokers & Customers for Vessels positions

Using third party software we are able to provide marine distances to all sectors of the maritime industry that are involved in the control of sea-going ships. [15]

4) Voyage Estimation/Chartering

Designed to support all types of calculations associated to a Voyage Estimation. Including a large and extensible port distances data base, the system permits on line checking of more than one vessel for the same job, Permits "What if" suppositions by interactive variation of all associated figures when modifying one of the estimation parameters. All necessary terms are already included in the system and easily retrieved. The system handles multiple cargos/parcels and unlimited number of loading and discharging ports

- Evaluation and Analysis
- Negotiation
- Fixture
- Vessel Nomination
- Cargo Nomination (COA)
- Multiple Cargoes
- Parceling
- Sensitivity Analysis
- Hire in / Voyage in Calculation
- Round Voyage calculation
- Optimum Speed
- Laytime calculation
- Quick Voyage Estimation
- Combine Voyage Estimates
- Voyests Group Comparison
- Fully Load Cargoes
- Auto Stem Bunkers
- Optimize Loading Bunkering
- BP, Netpas and Danaos Distances/ Routing/Map
- Voyests Options Comparison
- Historical data retrieval
- COA Management [16]

5) Port Expenses (DAs)

Port Expenses Module is specially designed for vessel port expenses and payment follow up. Initial offer and proforma invoice are entered into the system together with the final invoice. The updating of Danaos Marine Accounting is fully automated. The payment approval to the agent can be done through the system. Various reports specifying Disbursement Accounting department activity, i.e. number of invoices approved, checked, pending, paid, etc. are produced. The system is fully integrated with **DIABOS/DA DESK**.

Key Integration Points & Benefits

- An integrated fleet management system linking operations, chartering and accounting departments providing immediate value by sharing and improving access to commercial and operational information throughout the entire organization.
- Information is entered only once and shared by all departments and vessels
- Common Secured and Role based Environment
- Fully integrated with Danaos Info@gate messaging system
- Fully integrated with Accounting
- Alerts driven interdepartmental notification
- Centralized Data Library
- Integrated with Danaos S&P, Crew, Supply and PMS
- Integrated with Danaos Sea routes System for Vessel Optimal Routing Planning
- Ability to produce comparison reports through Chartering, Operations and Accounting
- Interfaces with DA's, Diabos, Q88, AtoBviaC Distance Calculator. [17]

6) Freight n Hire Collection

Freight & Hire Module is specially designed for Post-fixture information, Creating Debit Notes, Credit notes sent charterers, automatically created vouchers for accounting record non Debit Notes and Credit Notes issued, Recording charterer's payments and preparing vouchers for Accounting records. Keeping track of voyage revenues and expenses. Reporting: Voyage results reports, Charterers statement-including all movements for the specified charterer, Charterers Ageing Analysis report- Detailed, this report gives all Debit Notes, Credit Notes sent to charterer and payments received by charterers. As the report's name indicates, full age analysis of outstanding amounts is given to in order to enhance cash collection. Charterers Outstanding Analysis Report-Summary, this report gives the total outstanding amount by voyage on T/C.

Note: Reports can be issued as per fleet category, per specified vessel and charterer, per specified vessel and specified range of charterers etc.

Features & Functionalities

- Freight Invoices
- Demurrage Invoices
- Hire Invoices
- Hire Statement Report
- Fully integrated with Chartering and OPS
- Detailed Invoice Item Analysis
- User Defined Debit Credit Note Report
- Link with Accounting
- Automatic Calculations for Invoice items
- Voyage in Calculations
- Hire in Calculations
- Owners Statement Report
- Outstanding Analysis [18]

7) Laytime/Demurrage Calculator

Danaos Laytime module is integrated with the timesheet of the loading/discharging activity which comes from the vessel directly. It has been designed to assist users with laytime/demurrage/despatch calculations. It caters for all modern charter party clauses regarding commencement and cessation of laytime, thus allowing users to establish the demurrage /despatch due seamlessly in various scenarios. Depending on the terms and consequently the parameters inserted in the program, the system assesses laytime generating a detailed Statement of Facts mentioning all relevant data essential for the calculation. Laytime calculation is one of the most laborious, objectionable and time-consuming tasks in the shipping business; however, if done accurately, it can save a lot of money. With DANAOS powerful but user-friendly Laytime and Demurrage Calculation software, you need only minutes instead of hours for error-free calculation. That means you save time and effort as well as money.

- Easy-to-use calculation system for laytime and demurrage/despatch calculation. Based on the statement of facts the program generates a complete time sheet with automatic detection of day breaks, the time the vessel comes on demurrage and the changes in calculation thereafter
- Need to make a change in a laytime calculation? Just load the calculation, modify the figure to be changed

and get a complete re-calculated statement with a few keystrokes

The program supports all usual contract clauses for the laytime calculation including: Reversible / Non reversible / Average / Working time saved / All time saved once on demurrage, always on demurrage / Not always on demurrage Mixed reversible / non reversible
All usual laytime calculation terms already predefined: full time counting, half time to count, time not to count, rain, shifting time not to count and a free percentage value for partial counting in case of breakdowns etc. Working periods during weekends and non-counting periods on demurrage also supported

All usual SHex terms already predefined and user customizable. Non-standard regulations can be specified by begin/end day of week and time

• Features and Functionalities

- Reversible (All Ports, Loading, Discharge, Loading/Discharge)
- Non Reversible and Averaged Calculations.
- Integrated with Operations (C/P Clauses, Timesheets)
- Integrated with Freight & Hire Collection. [20]

8) Bunkering Management System

Bunkering Management Module monitors bunkering events and specially designed to provide continuous on line information for any company involved in the bunkers supply business, including oil companies, bunkers suppliers, brokers, intermediates, etc. The system automates invoicing & information system can update accounting files. Apart from the follow-up of the client's payment status, the company exposure and telex and official invoices, on-line information concerning the status of bunkers deliveries, past or future payments and customer's/ supplier's exposure, is also available. The above information can be obtained by stem, supplier, broker, etc. Thus the Bunkering System automates the bunkers supply process, providing complete information at any stage of the cycle in order to support accurate and fast decision making. [21]

9) SEEMP/MRV

DANAOS SEEMP module encompasses the full spectrum of IMO regulations and guidelines regarding ship efficiency. SEEMP module enables the management to identify the root causes of operational deficiencies and achieve above the competition performance level for each vessel type.

Energy Efficiency Module is a performance monitoring tool in terms in technical, financial & statutory (EEOI, MRV, etc.) terms.

The maritime Energy Efficiency Design Index (EEDI) was made mandatory for new ships and the Ship Energy Efficiency Management Plan (SEEMP) for all ships at MEPC 62 (July 2011) with the adoption of amendments to MARPOL Annex VI (resolution MEPC.203(62)), by Parties to MARPOL Annex VI. This was the first legally binding climate change treaty to be adopted since the Kyoto Protocol.

Fleet performance and environmental impact are benchmarked against the optimal level, allowing the shipping company to monitor, improve and report the results in a standardized format. Environmental impact & Fuel consumption are the key concepts behind DANAOS SEEMP module

Energy Efficiency Design Index (EEDI)

The EEDI for new ships is the most important technical measure and aims at promoting the use of more energy efficient (less polluting) equipment and engines. The EEDI requires a minimum energy efficiency level per capacity mile (e.g. tone mile) for different ship type and size segments. Since 1 January 2013, following an initial two year phase zero, new ship design needs to meet the reference level for their ship type. The level is to be tightened incrementally every five years, and so the EEDI is expected to stimulate continued innovation and technical development of all the components influencing the fuel efficiency of a ship from its design phase.

SEEMP should not play the role of another “paper form” instead, it should be utilized as a valuable toolkit for achieving ship energy optimization, enabling for improved and efficient vessel performance both in terms of fuel consumption and environmental protection. [21]

C. SHIP MANAGEMENT SUITE

Ship Management Suite Modules

- 1) Human Resources/Crew Management
- 2) Technical Management
- 3) Safety/Quality Management
- 4) Synchronization
- 5) Barcode

1) Human Resources/Crew Management

Crewing System

Application software specially designed for crewing departments or crew agents. Provides historical performance record for each seaman, personal card, seaman application, follow up.

Quick search for any combination of qualifications in seaman's personal card and means for evaluating seaman point system reporting of past performance. Actual crew list by rank is obtained both present and past.

Actually available or not available crew by rank. Possibility of allocating crew to vessels. Planning Reports for on board and ashore personnel.

Multiple crew list generated for U.S. immigration and other authorities.

LATEST ENHANCEMENTS IN CREWING MODULE

- Contracts libraries – Collective and Personal Agreements – Creation of RTF Contracts.
- Crew planning – Assignment Procedure – Advanced GANTT chart, selection of the best fit available substitute and direct assignment.
- Office Documents Alerts.
- Qualification of Officers Report (Officer Matrix – OCIMF, Q88), report based on OCIMF requirements, which can be exported as XML file and be uploaded to: [OCIMF Ship Inspection Report Program](#) (SIRE) and Q88.
- Crew Ticketing interface with Marine Accounting, Creation of off accounting and Final journal entries, Reports.
- Seagull Interface – CBT & CST Training
- Work/Rest Hours Utility allows Management, Master, and Seaman to be aware of the daily or weekly routine work periods, normally expected of them at sea and in port. It may be subject to control and ensure that the shipboard working arrangements are in conformity with the requirements and regulations.
- Retention Rate based on [INTERTANKO Formula](#).

Master's General Account

Designed to facilitate the Operation Department of a shipping company to automatically check Master's Accounts. Handles multiple collective and individual crew agreements. Validates pay-slips received from the Master. Processes monthly and extra allotments. Produces wages, tax statements and records of crew ledgers. Calculates retroactive wages and updates the accounting system with relevant entries. Reports for various statistics are included. Generates automatically list with payments of Monthly.

Additional Validations in monthly MGA

- New utility for computing onboard seamen balances (for budgeting purposes) with detailed analysis
- Changes in the Office Advances procedure and generation of new report for the not allocated advances
- Modification in the monthly allotments utility with the addition of corresponding bank details
- New notification from vessel via alert for crew remittances and generation of new report
- Changes in the procedure of producing seamen pay slips using the combination of collective and personal contract
- Compliance with New Hellenic taxation 2012 – tax solidarity

Crewing [TMSA Enhancements](#)

The Danaos HR/Crew Management Module is an advanced system that will enable the Customer to comply with the latest TMSA requirements.

The Danaos HR/Crew Management Module is perhaps the only software in the market today that has fully built-in all the KPIs required by the [TMSA questionnaire](#).

The Customer will be ready to implement TMSA on “day one” of the implementation without any further programming effort. [22]

2) Technical Management

[Planned Maintenance System \(PMS\)](#)

Application software specially designed for maintenance monitoring on any marine or industrial plant.

Integrates maintenance with class surveys. Permits decoupling of maintenance continuity from personnel changes. Semi-annual concise maintenance and survey planning and full maintenance plan for any required period. Spare parts usage monitoring and future requirements prediction. The Danaos Planned Maintenance System (PMS) is approved by [Det Norske Veritas](#) and by [Lloyd's Register](#).

Including:

Creation of the entire PMS, related technical forms and Survey Status into the system for the entire fleet can be outsourced to [Danaos Services](#). These services are performed by Marine Chief Engineers having extensive sea and rank experience.

Remote management of the PMS can also be outsourced to Danaos Services, where our Chief Engineers will monitor, update and maintain the system for the client, leaving just the decision making process with the client.

CORE / MAIN FEATURES

PLANNING

- Flexible Specification
- Library of Equipment with job schedules
- Planning reports
- Rescheduling
- Job Status reporting
- Condition based maintenance
- Alert Notifications

CLASS

- Survey Status
- Survey associated job reporting
- Integration Maintenance with Class Surveys
- Maintenance History
- Recommendation Follow Up
- CMS

SPARES

- Spares Usage and inventory
- Automatic Requisition Generator

- Spares future prediction
- Job Performance Analysis
- Repair costs follow up

TECHNICAL MANAGEMENT

- Docking Repair Planner
- Job Performance Analysis
- Budget Control
- Personnel Evaluation
- Overdue Maintenance Follow Up
- Critical Equipment Monitoring
- Engine Log Abstract Reporting

VESSEL

- Follow-up of jobs and surveys
- Spares requisitions
- Planning
- Rescheduling
- Reporting to office

SAFETY EQUIPMENT INSPECTIONS MONITORING

- Life Rafts
- Life Boats
- Fixed Fire Fighting System
- Portable Fire Extinguishers
- Pyrotechnics
- Life Saving Items
- Onboard Safety Tests / Inspections
- Gas Meters
- Onboard Drills
- Embarkation Ladders
- Life Jackets & Immersion Suits (IMM Suits)
- Flag and Shapes

- Breathing Apparatus & Associate Equipment
- Fire Main & Equipments / F.F.A
- Antipollution Equipments
- ISPS Items
- Defibrillators

Dry-docking Module

Danaos Dry-docking Module offers the creation of the dry-docking report, the sending to the various shipyards for quotations, the evaluation of the quotes, the final order placement and the follow up of the jobs done during the dry-docking.

Has a user friendly interface, utilising the “drag & drop” functionality which is offered by the Windows.

In one screen the user can select, define and create all that is required for the Dry-docking report generation. When the shipyards receive the files then they will be able to fill up their quotes and send them back to the office. Also the user will be able to import the quoted prices from the yards and thereafter from the Danaos Supplies Module to do the yard comparison. All the Dry-docking information will be saved on separate tables and in that way the user can retrieve historical information. [23]

SUPERINTENDENT INSPECTION SYSTEM

Superintendent Inspection software is specially designed for vessel survey and recommendation status monitoring. All surveys are followed up with windowing capability. Checking of survey execution within allowed windows is automated. Technical Department is informed at any stage about vessel's survey and recommendation status, overdue surveys and surveys due at any future date.

Danaos INSPECTIONS ON THE GO as part of [DanaosONE](#) is a mobile application solution for Apple iOS and Android devices. You can work either on the office with WiFi connection to the DANAOS ENTERPRISE database or off line on ship to inspect your vessel. When the tablet connects to the internet it synchronizes all jobs to the current state so your Inspection list is always up to date on shore. [24]

3) Safety/Quality Management

The [Danaos ISM](#) package is designed to provide the launch platform of the company preparation and certification to ISM requirements. It provides the backbone of the efficient

maintenance of the ISM system once the company is certified and ensures continuity of compliance. The degree of automation provided ensures that minimum human intervention is required for application the closed – loop principle of the ISM code. New tools in training and administrator open new horizons not only in light of the ISM but in the most efficient utilization of a company's human resources on board and ashore.

The basic structure of the ISM Administrator is consistent with the Danaos Ship Management Suite for office and vessel. A complete and integrated safety, quality and information system can be built giving the shipping company the benefits of a unified platform to build its competitiveness.

- ISM Manual Administrator: Version Control – Prior and future Version Generator – Distribution control – Document oriented structure – Cross-referencing – Shipboard, Professional and office manual integrated approach – Search capability. (Optional: basic Approved Manual.)
- ISM Checklist Administrator: Flexible specification of checklist items – version control – Distribution control – Frequency specification – Dynamic form generation from checklist items. (Optional: Analysis of on board performance of drills and procedures – Monitoring of safety system – Electronic transfer of forms and results).
- ISM Training Assistant: Preparation of training sessions – Creation of Company training schemes – Preparation of Quiz – Evaluation of trainees – Multiple choice interactive trainer – Manual Interactive instructor. (Optional: basic ISM training package and quiz.)

ISM Operation :

- Accident Reporter: Recording of accidents and near-misses – Conditions, details injuries recording – Statistical evaluations – Near miss correlation analysis – Accident causal analysis – Follow-up of accidents – Documentation control – Corrective action control – Graphical presentation of statistics.
- Safety and Audit Inspection: Flexible definition of inspection items – Scheduling of inspections per vessel- Planning of Inspector visits – Archiving of inspections – Recording of Deficiencies. (Optional: Archiving of inspections photos – Comparative/evolutionary item analysis – Quality/Safety deficiency reporting – Internal/Statutory audit follow-up).
- Drill Administrator: Preparation of applicable drills per vessel type, flag and trade – scheduling of drills – Record Keeping – Participant recording.

- Seminar Administrator: Scheduling of seminars – Allocation of participants – Record keeping for execution and participation.

KPI's & TMSA

The KPI's concept: Key performance indicators are discrete measures that track a company's effectiveness in meeting its aims and objectives. They are a set of "vital signs" that represent the state of company's operational health. When used as part of a measurement system, they determine the quality of the processes and the degree to which the aims and objectives are being achieved.

By monitoring KPI's the operators, irrespective of department, are able to manage their continuous-improvement programs.

The integrated approach of all the functions of a ship management company in one integrated system provides the appropriate infrastructure to support KPI's setup and monitoring.

The new Enterprise Edition has this functionality as built-in. A mechanism to enrich KPI's library is available. KPI's definitions and their arguments are user defined and may be published easily to the system. A framework of utilities is offered to cover the publishing procedure. Members of IT departments or even users can create, compile and test different KPI's without risking the integrity of the system.

KPI's monitoring mechanism provides the appropriate feedback either to a specific department e.g. operational, technical, crewing etc. or to the management. Feedback gives to operators, superintended engineers and other a clear objective picture of their performance, allow them to identify gaps and plan future improvements. Results of KPI's scoring may be used also for demonstrating performance to 3rd parties and/or business partners.

Future requirements

- QA procedures are the first step of a long process for a company to set up the procedures for quality operation.
- The definition of corporate goals in a unique and measurable way is the next step.
- The continuous monitoring of goal achievement, the identification of deviation, the monitoring of corrective actions and their results is the third step.
- The final step is to evaluate the risk of not achieving the goal at every operation and take the necessary cost effective controls to minimise the risk.

The above steps are the key elements of the continuous improvement process, i.e. Improve Plan Measure Act.

[ISO 14000](#) is the new standard designed to cover:

- environmental management systems
- environmental auditing
- environmental performance evaluation
- environmental labeling
- life-cycle assessment
- environmental aspects in product standards

The Environmental Management System has a central role in shipping companies, not only as managerial instrument of environmental and safety complexity inside and outside to the activity of the company, but also as way to change the environmental constraints in business opportunity, to reduce the costs and to save resources, and to face on the markets with systematic nature the competition.

- the costs and the environmental responsibilities;
- the competition;
- the evaluation of the environmental engagement on behalf of shareholders;
- the national and community regulations.

The Danaos software is an advanced system that will enable the Customer to comply with the latest TMSA requirements. The Danaos system is perhaps the only software in the market today that has fully built-in all the KPIs required by the TMSA questionnaire. The Customer will be ready to implement TMSA on “day one” of the implementation without any further programming effort.

[TMSA Compliance and software integration](#)

It is very important to use an integrated software system for effective calculation of KPIs for TMSA compliance. Most KPIs specified in the OCIMF questionnaire require the processing of data that are derived from multiple software modules and the execution of specific algorithmic calculations on that data. If the modules are not integrated then the automatic calculation of the KPIs is impossible and can only be performed manually, a process that will take a considerable amount of time.

The [risk@assessor](#) is a structured risk assessment program for ships operation covering operational, accident, security and environmental risks with a unified approach. RAP considers risk assessment as an endless procedure utilizing business learning mechanisms based on industry and company previous experiences.

An integration approach of hazardous processes risk estimation with evaluation of hazardous events consequences is provided to support Risk Assessor to estimate risks with accuracy (according to the Code of Safe Working Practices for Merchant Seamen published by MCA, which is based on BS 8800 standard) and Risk Manager to implement plan of actions to reduce the consequences or the probability of occurrence (Risk management definition BS 4778).

RAP combines risk assessment with hazardous events analysis based on the following model:

A. Definitions and relationships

Hazard:

the source or a situation with a potential for harm in terms of human injury or damage to property, damage to environment or a combination of these.

- Hazardous event
- Hazard & (lack of control | control failure)
- Accident
- Hazardous event & consequences

Operation:

Any eventual activity defined as operational :company controlled (procedural, emergency, ad hoc) scenarios externally initiated: security vulnerability aspect having environmental impacts (operational or built-in)

The relation between risk assessment and accident analysis is based on hazard the elementary unit of risk theory according to the formula

SRA Hazard \Leftrightarrow Cause in accident analysis

Another one-to-one link that may be established is

SRA \Leftrightarrow Particular accident event

B. Functional specifications

Shipboard operations (procedurals, emergency or ad-hoc ships-controlled processes), possible non-controlled threats (scenarios) and aspects concerning environment are objects with risks. Risks must be identified and classified systematically before any risk assessment in order to support risk management. A hierarchical tree structure risk identifiers library must be implemented according to company's risk management policy.

Any assessed operation may have more impacts regarding human health, security vulnerability, ship operations, or

environmental contamination and consequently more than one risk assessments.

The following functional specifications and relationships are supported:

- Any operation may have more than one a types and risk assessments utilizing the corresponding risk matrix table
- Any operation assessment type evaluates the risk for one or more hazards
- Assessment types may be classified to subtypes
- Any operation may linked with general controls, references and attachments
- Any accident may be linked to one operation
- Hazards, controls and causes are classified as Risk may be assessed for more than assessors
- PF (personal factors),
- JF (Job factors),
- UC (Unsafe conditions),
- UA (Unsafe acts), and
- R: Root (plan, compliance, Standard).
- Risk assessment history must be recorded.

C. System ready for use

Danaos [Risk@ssessor](#) is ready for use providing a standard operations library as well as a detailed libraries for hazards (=causes) per type. Hereafter with minor changes (if required) the system may be immediately alive.

D. Risk assessment, Events, Risk management

The consequences of any hazardous event (accident, incident) in terms of its consequences are quantified. The related operation risk assessment may be reevaluated. Additional control may be suggested and risk assessment attributes (consequences, frequency) should be reviewed.

E. The system structure

In the following diagram, the internal structure of the system is presented. The architecture enables the link between the assessments and the accident that was occurred and therefore supports the risk management.

F. Presentation level

Risk assessments are consolidated and presented in a content form. A typical presentation with filtering capabilities is shown above. For example the percentage of operations assessed as substantial by a given assessor or all assessors' and many other answers satisfying criteria combination will be provided. For support risk management a frequency and severity statistical report per hazard is provided. [25]

4) Synchronization

DANAOS Daemon software is specially designed to replicate data from office to vessel and apply strict transactions control procedures including the verification of business rules regarding the information received from the vessel.

This design aims to guarantee 100% accuracy and reliability of the corporate information preventing the crew onboard of performing setting up work, risking the fleetwide consistency and integrity.

DANAOS Daemon synchronisation module is totally independent of the communication media, protocol and software system used to establish communication between vessel and onshore locations. This concept offers your company the flexibility to choose the most cost effective solution in the market depending also on the operational pattern of the vessels.

For example a tank operating at an area where mobile telephony is available can use it instead of the expensive satellite communication. For a vessel sitting in the port where the office is located, an updating using magnetic media should be probably most appropriate. Danaos has the expertise to fine tune any communication system to DANAOS Daemon synchronization module.

The purpose of the synchronization tool is to facilitate data-transfer from the office database to vessel database and vice versa, in an optimized and secure way. Since data synchronization requires in-depth understanding of systems database, Danaos has implemented its own synchronization tool and process.

Users in the office update only the office production database and users aboard the vessel update only the vessel production database. The synchronization process automatically controls the updating of the other databases. Frequency of synchronization can be determined according to business needs.

Danaos synchronization creates several files during the process. There are several ways to transmit files created in synchronization to the remote location. Transmission can use standard applications that are MAPI complaint such as Outlook or Outlook Express; proprietary applications such as Info-Connect; or use other means to transmit the file. Danaos synchronization can be setup to transmit files via email. When this option is enabled, the application zips the created files to

update remote database, keeps a copy of the zipped file, and sends the file via email to the remote location. [26]

5) Barcode

The correct management of onboard supplies, including spare parts, hardware, safety equipment and more is a difficult, yet crucial task.

A task that just got easier through the release of DANAOS' new barcode application.

DANAOS BARCODE is fully synchronised with the DANAOS Supply Module in order to ensure consistency between actual inventories and the information contained in clients' corporate database.

Key features:

- Assigns a unique code to each item in the DANAOS Supply Module
- Produces unique barcode labels for each item
- Keeps a complete log of which users have performed which tasks

During inventory:

- > Displays item descriptions on the handheld barcode scanner in order to ensure that the correct item has been scanned
- > Gives users the option to scan each item or to scan the item once and then enter the quantity manually
- > Performs a validation between the scanned items and the database entries in order to ensure consistency
- > Synchronises inventory data with vessel databases and then sends it back to the headquarters database through synchronization. [27]

➤ PROVISIONS CONTROL SYSTEM

Provisions Control System is specially designed for provisions supply and follow up for shipping companies.

- Provides automation of the complete supply cycle. Requisition, quotation, order, delivery, invoice, without data transcription on any intermediate stage.
- Permits grouping per item/category and automatic substitution.
- Optimises supply quantities, supplier selection, order allocation and automatic ordering in accordance with model orders. Information to supply department with pending requisitions critical supply dates, pending

quotations, orders, deliveries. Deliveries for time period, historic prices and actual/reference consumption analysis per item/group. Informs management with actual/reference cost analysis per day and man day. Shifting period cash-flow requirements covering last six months and projecting next six.

The entire function of creating the Supply Cycle system, including but not limited to, stores and provisions catalogue creations and Machinery Spare parts catalogues can be outsourced to Danaos, where our data team will collect and harmonise the data before creating them into the system under appropriate departments and catalogues. [28]

➤ STORES CONTROL SYSTEM

Store Control Module is specially designed for stores supply for shipping companies.

- Supports departmental division and follow up.
- Provides automation of the complete supply cycle (Requisition-Quotation-Order-Delivery-Invoice) without data transcription in any intermediate stage.
- Optimizes supply quantity and supplier selection process. Informs supply department with pending requisitions per department, critical stores requirements, requisition progress and pending quotations, orders, deliveries, invoices. Deliveries per department for time periods, historic prices. Evaluates quantity requirements with automatic unit conversion. Complete inventory with evaluation. Informs management with moving average cash-flow requirements, covering last six months and projecting next six.

The correct management of onboard supplies, including spare parts, hardware, safety equipment and more is a difficult, yet crucial task. A task that just got easier through the release of **DANAOS' new barcode application**.

Danaos BARCODE software is fully synchronized with the **DANAOS Green Supply Chain Management Modules** in order to ensure consistency between actual inventories and the information contained in clients' corporate database.

- Assigns a unique code to each item in the DANAOS Supply Module
- Produces unique barcode labels for each item
- Keeps a complete log of which users have performed which task
- During inventory:
 - Displays item descriptions on the handheld barcode scanner in order to ensure that the correct item has been scanned
 - Gives users the option to scan each item or to scan the item once and then enter the quantity manually

- Performs a validation between the scanned items and the database entries in order to ensure consistency
- Synchronizes inventory data with vessel databases and then sends it back to the headquarters database through synchronization. [29]

➤ SPARE PARTS CONTROL SYSTEM

Spare Parts Control Module is specially designed for spare parts supply and integrated follow up for shipping and offshore companies.

Provides automation of the complete supply cycle (Requisition, Quotation, Order, Delivery, Invoice) without data transcription on any intermediate stage. Optimizes supply quantities and supplier selection process.

Information is produced for the technical department and the management. Technical department has full and easy control over requisition and order status pending quotations, orders, deliveries and invoices. Also, complete inventory with evaluation and historical prices paid or quoted. Management has moving average cash-flow requirements covering last six/three months and projecting next six. Complete cost analysis per system is obtained at any stage. [30]

D. DANAOS ON-BOARD SYSTEMS

DANAOS on-board system is a set of modules designed to provide ship officers with an easy and efficient tool to handle the majority of their daily administrative work.

The system relies on the “Shore based Ship Management” concept. Headquarters are the pivot point where information is collected. This information is processed in conjunction with company policy and transferred back to the vessel in the form of instructions, checklists, manuals and procedures. DANAOS On-Board System creates instantly all Paper Work required according to the latest company procedures. All required information is transmitted back to the headquarters for further processing.

DANAOS On-Board System are on-board extensions of the DANAOS WEB ENTERPRISE SUITE that interface with machinery monitoring and bridge equipment to integrate ship-to-shore communication and covert data into useful information, almost real-time.

Vessel Operations Allows officers to electronically fill up and transmit to the office noon, arrival and departure telegrams. (Optional : Port events log can be created according to your company and trade standards for transmission to the office-crew manning, increasing efficiency and saving time.

Crewing System Active crew handling – Crew List preparation according to different standards – Crew qualifications and certificates handling – License seaman book and official documents expiry dates.

Plan Maintenance System Maintains records of all maintenance activities – prepares jobs plan for any period – Allows chief engineer to update jobs completed – Creates electronically job’s cards and the coded mail for the headquarters – Last maintenance action reporting – Maintenance history reporting – Emergency jobs handling – Spares usage.

Spare Parts Control System Automatic creation of spares requisitions – Real time inventory control – Minimum maximum stock control – Recording of spares to be repaired – Deliveries handling with automatic inventory update.

Stores Control System Creates Stores Requisitions – Departmental inventory control – Minimum Maximum stock control – Deliveries handling – Spot Deliveries.

Provisions Control System Requisition creation – Inventory control – Minimum Maximum stock level control – Deliveries handling – Spot Deliveries..

On-Board ISM Safety manual search print and electronic update – Training session presentation and quizzes – Transfer of results to headquarters- Scheduling of Drills – Electronic write up and transfer of results. (Option : Predefined check list and inspection forms fill up and data transfer to office.)

TheRisk @assessor program On board risk assessment module provides to the Vessel Officers the same functionality with the HQ module and the appropriate user interface for assessments generation either from scratch or based on existing from HQ distributed library. The user interface is similar with the HQ version with some additional tick-boxes regarding weather conditions, temperature, and visibility and assessor experience. Prepared assessments may not need office approval, and may be sent as email to the office. Whenever an assessment is marked to send to the office is considered as final and is locked.

Master General Account (MGA) Procedures pay slips for all seaman according to National and contract – Master Accounts- Cash on board – Allotments – Advances – Bonded Stores – Telegrams – Overtime etc. [31]

E. DANAOS BUSINESS ANALYTICS

DANAOS BUSINESS ANALYTICS consolidates and integrates data stored either in [DANAOS ENTERPRISE Suites](#) and/or other data sources (including web files, ASCII, .XLS files etc), providing dynamically personalised dashboards and assisting maritime organizations in the decision-making process.

DANAOS Business Analytics is all about Cognitive Understanding as it transforms raw data into useful information and content into context.

By encompassing DANAOS's Apps user roles and attributes, DANAOS BUSINESS ANALYTICS provides a set of personalised dashboards that dynamically and securely adjust to the role of each user within the Organization enhancing horizontal and vertical data exploration (drill in). As Data analytics has gradually emerged as an integral part of business intelligence solutions, DANAOS has strategically partnered with [Qlik](#) and incorporated [QlikSense](#) within DANAOS apps and Suites, trusting that as any other organization worldwide, maritime industry should also be able to analyze raw business data and turn into insights.

Since analyzing complex business information manually is a humanely impossible task, it is necessary to leverage advanced technology to turn business data into insights. As a result, [DANAOS](#) has tied-up with [Qlik](#), the most efficient **fully WEB data analytics and visualization tool**, making **ON-THE-FLY dashboards** available on any device including tablets and smartphones.

In order to ensure efficient integration of information from DANAOS and non-DANAOS data sources, **DANAOS Business Analytics Offering includes pre-configured dashboards for [FINANCIAL](#) – [COMMERCIAL](#) and [SHIP MANAGEMENT SUITES](#).**

DANAOS provides guided analytics training and support services ensuring successful design and launching of Data Discovery dashboards for any client. [32]

II. ABS Nautical Systems (ABS – American Bureau of Shipping)

ABS SOFTWARE: NAUTICAL SYSTEMS FLEET MANAGEMENT

Meeting Challenges in the Marine Industry for More Than 30 Years

The NS Fleet Management Solution is made up of software modules designed to deliver unparalleled operational and compliance support to improve efficiency, ensure safety and drive performance.

Modules

1) [Maintenance Manager](#)

Facilitates lifecycle maintenance and survey planning for improved cost control, resource management and equipment reliability.

2) [Purchasing Manager](#)

Enables unified management of procurement and inventory control activities to deliver an efficient, cost effective and compliant procurement process.

3) [Drydock Manager](#)

Supports faster drydocking with management tools for planning, bidding, executing, analyzing and negotiating.

4) [Hull Manager](#)

Documents asset conditions to drive more efficient planning and management of structural maintenance and the drydock process. 3D capability enables users to map gaugings and structural conditions in a 3D virtual environment.

5) [NS Voyage Manager](#)

Provides visibility into critical performance areas, including environmental compliance, vessel performance and voyage tracking.

6) [Vetting Manager](#)

Supports the vetting process from pre-inspection through acceptance, providing a comprehensive knowledge base with a complete history of all past vetting inspections.

7) Crew & Payroll Manager

Supports a comprehensive workforce management process to easily and efficiently deliver the right crew, for the right task, at the right time, to reduce costs and drive compliance.

8) HSQE Manager

Drives a safety culture with a process centered on safety, risk mitigation and management of change that ensures compliance and reduces port state detentions.

9) NS Cloud [33]

of NS Drydock specifications and RFQ responses for improved competitive bidding.

- NS Maintenance Manager integrates with Financial and Accounting systems, Enterprise ERP systems, Condition Monitoring vendors and eCommerce providers.
- Supports compliance with a broad range of requirements including class surveys, manufacturers, TMSA and ISM. [34]

2) DELIVERING THE RIGHT PART AT THE RIGHT TIME AT THE RIGHT COST

Low freight rates and increased operating costs are a fact of life in today's operating environment. Procurement is no longer simply an administrative function, but plays a strategic role in driving operational efficiency in an organization.

The NS Purchasing Manager provides unified management of procurement and inventory control activities to deliver an efficient, cost effective and compliant procurement process

NS Purchasing Manager Capabilities

- Intuitive dashboards provide simple and efficient access to all the information needed to manage the entire purchasing process.
- NS Purchasing Manager enables a robust quotation process. Multiple vendors from multiple regions are included in the same RFQ, and currencies will be automatically converted for comparison.
- NS is the hub of comprehensive supply chain management, supporting electronic bidding and order placement, logistics tracking, electronic invoicing and catalog management.
- Inventory replenishment is automated via client policy levels. Requisitions needed to bring spare parts inventory to minimum requirements can be generated with one click.
- NS Purchasing Manager is integrated with NS Maintenance, Inventory, NS Drydock and HSQE Managers to facilitate global purchasing efficiency.
- The Integration Manager enables data exchange to a wide variety of third-party applications such as Financial and Accounting systems, Enterprise ERP systems, Condition Monitoring vendors and eCommerce providers.

Supports compliance with company financial controls, financial regulations (SOX and EU), SEPA and tax reporting. [35]

1) Keeping Your Ship Moving

Reducing the cost of maintenance and keeping vessels in service challenges owners and operators every day. Maximizing the uptime and reliability of a vessel and its equipment requires a comprehensive maintenance management process. The complexity of the regulatory environment governing these activities is steadily increasing. As workforces age and evolve, simple and effective tools and systems are more important than ever.

The NS Maintenance Manager is a sophisticated and intuitive software platform that facilitates lifecycle maintenance and survey planning for improved cost control, resource management and equipment reliability.

NS Maintenance Manager Capabilities

- Maintenance scheduling, tracking, forecasting and execution come together in a single screen to enable users at any level to manage past, current and upcoming maintenance tasks.
- The NS Equipment Explorer contains all of the information related to equipment and maintenance on each vessel in a central repository.
- Mechanical systems are listed based on the unique standards and terminology of the vessel.
- The equipment hierarchy is designed to grow and change with operations.
- Integration with NS Purchasing, NS Drydock, HSQE and Hull Manager facilitates global purchasing efficiency and enables rapid creation and deployment

3) PREPARING. MONITORING. NEGOTIATING.

Drydock is the single most expensive and complex maintenance event in the life of an asset. With NS Drydock Manager, the planning, bidding and execution process is managed in one place, delivering a well-maintained and compliant vessel at the best price.

Leveraging existing equipment information and maintenance history, NS Drydock Manager prepares the drydock specification, facilitates competitive bidding, monitors execution in the yard and supports negotiation of the final drydock bill.

NS Drydock Manager Capabilities

- Users have easy access to all of the drydockings for an entire fleet, both current and historical, with all corresponding documents.
- The Drydock specification is generated for each shipyard. Users may easily send competitive bids to multiple yards.
- The job tab provides unified access and visibility to all information required to manage Drydock execution and budget.
- Consolidated and detailed bid and drydock history strengthens negotiating position during final drydock cost validation and settlement.
- Using data in NS Maintenance, Purchasing and Hull Managers, NS Drydock Manager delivers a complete structural and machinery specification to reduce preparation time, ease bid preparation and comparison, and unify financial reporting to accelerate return to service.

Supports compliance with class surveys, ISM and TMSA. [36]

4) ENABLING COMPREHENSIVE ASSET MANAGEMENT

Too often, hull maintenance is managed in a reactionary way and is considered secondary to the planned maintenance of equipment on board a vessel, leading to unexpected costs at drydock. NS Hull Manager fully integrates structural integrity management into the maintenance, purchasing and repair planning or drydock process, assisting with comprehensive maintenance strategies and efficient drydock and repair campaign planning.

Leveraging a ship-specific model, NS Hull Manager delivers the industry's most comprehensive predictive and preventative asset lifecycle management tool.

NS Hull Manager and Hull Manager 3D Capabilities

- Intuitive dashboards provide simple and efficient access to the structural condition of each compartment on the vessel through graphical representations that are easy to understand.
- The inspection scheduler gives both office and crew full visibility of all hull inspections – planned, ongoing or completed.
- NS Hull Manager supports a more efficient and accurate process to manage repair of structural anomalies.
- NS Hull Manager integrates with NS Maintenance, Purchasing and Drydock Managers to deliver comprehensive asset lifecycle management tool.

3D Visualization with Hull Manager 3D

The powerful addition of NS Hull Manager 3D to Hull Manager enables users to map thickness measurements and anomalous conditions in a 3D virtual environment.

- Visualization of substantially corroded areas simplifies the assessment process and assists with a more automated creation of repair plans.
- The 3D module allows operators to quickly visualize the current condition and predict condition at any future time for development of optimal repair strategies.
- HM and HM3D support critical strategic decisions regarding asset life extension, disposition and repair, sell or scrap strategies.
- Extraction of as-gauged model information can be used to rapidly reassess corroded areas to optimize repair solutions and rapidly develop repair specifications.
- Repair options can be assessed and optimized vs. Class rule criteria via the HM3D linkage to the Altair HyperworksTM Finite Element Analysis suite.
- Supports compliance with Class surveys, TMSA and ISM. [37]

5) NS VOYAGE MANAGER

Owners and operators will continue to see new and broader environmental requirements coming from domestic, international and industry regulatory bodies. With each new regulation, a new set of data will need to be captured managed and reported on. The NS Voyage Manager supports

compliance with and reporting of a variety of port state and international environmental regulations including:

NS Voyage Manager Capabilities

- **EU MRV** - Emissions data capture with EU approved excel reporting template built in.
- **IMO DCS** - Emissions data capture with IMO approved reporting built in
- **Ballast Water Exchange** - Capture ballast water exchange data with US EPA and generic Port State approved formats for reporting
- **Fuel Switching (ECA Compliance)** - Capture fuel switching activities for reporting to Port States
- **Garbage record Book** - Capture garbage management activities to support MARPOL V reporting
- **Oil Record Book** - Capture oil transfer activities to support MARPOL oil record book
- **Vessel General Permit (VGP)** - Capture environmental activities with US EPA electronic report submission
 - **Bunker Delivery Notes** - Capture bunker delivery note information to support MRV reporting

Through an easy to use web interface, operations personnel can easily access critical information for voyage planning, and environmental impact to maintain a compliant and efficient operation.

Quick and Easy Implementation

The NS Voyage Manager is deployed in a cloud environment for quick and easy set up and is offered with subscription pricing. Contact us today to learn how easy it is to get started.

Improve Accuracy with NS AutoLogger

With the addition of NS AutoLogger, accuracy is improved through automatic capture of sensor data.

Key Features:

- Secure marine-grade appliance
- Capture data directly from sensors and ship systems
- Improved accuracy of logged data
- Data logging on demand

- Custom defined data transfer systems
- Automated Import of data to NS Noon Reports
- Eases reporting procedures for Environmental Compliance

Seamless integration with the [NS Maintenance Manager](#) for equipment, spaces and maintenance plan, in addition to [NS Crew Manager](#) provides operators with a comprehensive view of voyage history. [38]

MRV (MONITOR, REPORT, VERIFY)

The European Union's Monitoring Reporting and Verification Regulation will come into force January 1, 2018 and monitoring plans must be submitted by August 2017. Owners and operators trading in the EU must comply and need to begin planning to ensure the proper IT infrastructure is in place and personnel is properly trained. Accurate data collection and storage is critical to compliance. Currently, the majority of this data is being captured on paper making reporting a challenge. Further, accuracy of emissions calculations is critical. The increase in data captured and reported on can overburden the crew and lead to inaccuracies.

ABS NS MRV Reporting Solution

ABS Nautical Systems alleviates this burden with an MRV solution that enables owners and operators trading in the EU to accurately capture, manage and report on CO2 emissions. NS MRV is integrated with the NS Voyage Performance Manager and automatically calculates emissions and generates the required EU excel report. Data is captured through standard voyage activities in Noon reports or can be automated through the NS Auto-logger.

All supporting plan data needed to produce the approved MRV annual report is stored within the NS database including:

- Monitoring plan data (Plan ID, version, approval date, monitoring method, etc.)
- MRV Verifier Company Information
- Vessel Operator contact information

NS supports all combinations of Monitoring Plans:

- Single plan for the entire organization
- Multi-ship plans by fleet
- Individual plans per vessel
- Combination of Individual and multi-ship plans

NS Auto-Logger:

With NS Auto-logger, data is automatically captured through available sensor data so owners and operators can be assured of data accuracy. NS Auto-Logger:

- Captures all available sensor data
- Allows selected data to be replicated on shore
- Directly updates database
- Eliminates manual entry

With the NS MRV reporting tool, owners and operators can be assured of accurate compliance to the new EU regulation. The addition of the NS Auto-Logger will improve accuracy and greatly reduce the burden on the crew. [39]

Compliance Management (Meeting the Challenge of Compliance)

Ship owners face potentially unlimited liability for environmental incidents. The NS Compliance Management Solution leverages NS software to facilitate and enforce processes to mitigate this risk and enable owners and operators to consistently demonstrate compliance.

NS Compliance Management is optimized to meet the compliance challenges of the maritime industry with tools to facilitate planning, execution and documentation of all compliance activities:

- NS takes a unified approach to planning.

The Maintenance Time Plan coordinates and schedules all activities for structural and machinery maintenance.

The Quality Time Plan coordinates and schedules all activities for vettings, inspections, drills and audits.

The Crew Planner assures qualified personnel are assigned to activities onboard and onshore.

The Voyage Planner coordinates and schedules all voyage, environmental and operational events.

- Recording data is seamlessly integrated into daily onboard activities. Shared data simplifies complex compliance reporting.
- Analysis tools facilitate trending and continuous improvement.
- NS reinforces a safety culture with tools that mitigate risk to people and the environment including **Job Safety Analysis** and **Behavioral Based Safety**.

- A Document Management System ensures that required documentation is easily available and shared appropriately.
- Supports all reporting required to demonstrate compliance.
- Management Systems Review is supported through a combination of statistical and graphical reports covering incidents, CARS, inspections, meetings, drills, audits and vettings. [40]

ASSET MANAGEMENT (MAXIMIZING THE ECONOMIC VALUE OF ASSETS)

Competing for charters in today's environment is challenging, forcing owners and operators to take a more strategic approach to asset management to maximize the economic value of each vessel. IT solutions designed around processes that cut across different functional areas are necessary to provide accurate and timely information to key stakeholders for critical decisions.

NS Asset Management integrates information across maintenance, structural integrity, purchasing, safety and quality management processes.

Planning and Execution

NS Asset Management is a comprehensive solution that enables cost and operational efficiencies at every stage in the asset lifecycle.

Maintenance - Drives efficiency, reduces downtime and lowers total cost of maintenance.

Structure - Tracks anomalies and maximizes life of asset.

Materials - Maintenance plan supports competitive bidding for right sized inventory.

Procurement - Optimizes procurement process to reduce costs and enables eCommerce.

Drydock - Proactively plans and negotiates scope, costs and timelines. [41]

NS WORKBOAT

a) Subchapter M in the Palm of your Hand

The first of its kind completely mobile solution developed specifically for the workboat and inland sectors to support day to day operations on board and decision making on shore. Delivered in a turnkey package to enable Subchapter M compliance from day one.

b) Key Features

- Mobile onboard

- Automatic Office Notifications
 - Turnkey Implementation
 - Quick start pre-configured based on Subchapter M compliance option
 - RCP, TSMS, ISM
 - US Coast Guard Inspections
 - No IT infrastructure required
 - ABS pre-installed tablet option
 - No onboard hardware required
 - Cloud-based office installation
 - Unified data and document storage
 - One-stop audit support
- c) *Mobile Onboard*

The NS Workboat mobile application was designed to assist with standard day-to-day tasks while capturing data for Subchapter M compliance at the same time. Pre-configured on an easy to use tablet, the application requires very little training and does not require any installed software on board. We offer a turnkey implementation so users can be up and running in no time.

Insight in the Office

The data captured on board for compliance can also provide valuable insights in the office. Take advantage of newly required data to make better operational decisions to improve performance. [42]

KEY FEATURES	
Task List	Inventory
Crew List and Sign On	Checklists
Maintenance Tasks	Meetings and Drills
Inspections	Work Orders
Audits	Critical Equipment
Running Hours	Hazard Identification and Observation

[43]

Subchapter M Software (Bringing Bluewater Safety Management Into Inland Waters)

The Subchapter M regulation will have the same impact on smaller vessels that the International Safety Management

(ISM) standard has on larger vessels, creating a large business process and systems challenge for small boat operators. Nautical Systems Software long supported compliance with ISM for the maritime industry and understands the challenges owners and operators face when implementing a Subchapter M compliant Safety Management System.

The NS Subchapter M Solution enables operators to simply and easily capture, manage and report on all the information required to demonstrate compliance with Subchapter M.

- Everything is visible and accessible from one screen. Users can easily and efficiently complete all subchapter M activities.
- Wizards simplify critical compliance tasks and enable accurate data capture for reporting.
- A Subchapter M dashboard provides push button access to all required reporting.
- The solution is cloud based with subscription pricing to minimize capital expenses and alleviate the need for additional IT resources.
- Turnkey implementation improves roll-out of the software and ensures readiness from day one.

Additional Services

Through ABS and its affiliated company ABS Group, NS customers have access to a comprehensive portfolio of safety, risk and compliance services available to support Subchapter M Compliance including:

- Business Process Mapping
- Best Practices Consulting
- Safety Management Systems Consulting [44]

NAUTICAL SYSTEMS PERFORMANCE MANAGEMENT (THE NEXT GENERATION OF VESSEL PERFORMANCE)

ABS Nautical Systems is leading innovation to address the challenges of compliance and operational efficiency with the most comprehensive tool available that includes both vessel and environmental performance. NS Vessel Performance leverages a ship-specific performance model based on vessel design characteristics. The model delivers performance predictions using sea trial data and other relevant information to establish performance baselines. Combining model output with the visualization and analysis of vessel operations data improves decision-making. Demonstrating this capability to owners and charterers directly improves bottom line results and provides a competitive advantage.

Capabilities

Model Based - ABS leverages a Ship-specific Propulsion Model improve decision making by more accurately reflecting true vessel operations.

KPI-Driven Decision Support - A set of KPIs for Vessel Performance are established to enable decision support both on shore and aboard the vessel. Including:

- Hull and propeller performance
- Main Engine condition
- Auxiliary Engine/Systems base load operation
- Vessel/fleet benchmarking of performance
- Prediction/planning of fuel efficiency improvement measures

Accurate Compliance - Operational profiles for fleetwide comparison, consumption overviews of shipboard components and further KPIs can be derived from data to assess operational efficiency, maintenance strategies and conformance to charter party requirements. Fuel consumption and emissions calculations enable compliance to environmental regulations, including MRV, and contribute to an active Ship Energy Efficiency Management Plan.

Web-based Interfaces for Analysis and Reporting - Provides easy access to data for custom reporting and analysis on specific performance issues or for fleetwide benchmarking and comparison.

Fully Integrated - The Vessel Performance tool is completely integrated with the full range of Nautical Systems fleet management applications delivering one complete solution. [45]

6) PREPARING FOR INSPECTION

To achieve success in today's competitive shipping environment, owners and operators must maintain a fleet of vessels available with sound vetting records. Higher vetting scores lead to more charter opportunities.

The NS Vetting Manager supports the vetting process from pre-inspection through acceptance. Users have access to a comprehensive knowledge base with a complete history of all past vetting inspections. Responses and actions can be leveraged to assess overall readiness and support continuous improvement of the vetting process.

NS Vetting Manager Capabilities

- Intuitive dashboards provide simple and efficient access to all the information needed to prepare for and manage vetting inspections. Users can easily

access the status of inspections at both fleet and vessel level to better manage the response process.

- Users can view observations based on the relevant inspection sections for standard protocols including OCIMF SIRE, OVIQ and BIQ. Documented observations by inspector can be linked to corrective actions to fully document the result.
- A comprehensive response library provides properly worded and pre-vetted responses to the observations by vetting inspector. New responses can be added so the vetting response process improves over time.
- Seamless integration with the HSQE and Maintenance Managers ties observations to corrective actions and the resulting maintenance and repairs for a complete resolution and documentation.
- NS Vetting Manager supports integration with Q88.
- Supports compliance with TMSA, OCIMF SIRE, BIQ and OVIQ. [46]

7) SCHEDULING THE RIGHT CREW AT THE RIGHT TIME

Finding and retaining qualified crew continues to be a challenge for the maritime industry. As the maritime workforce transitions to new regions and a younger generation of workers, onboard crew will be tasked with maintaining increasingly sophisticated vessels and machinery, and the extensive documentation required to demonstrate compliance.

NS Crew Manager supports a comprehensive workforce management process that makes it easy for owners and operators to easily and efficiently deliver the right crew for the right task at the right time to reduce cost and drive compliance.

NS Crew and Payroll Manager Capabilities

- Intuitive dashboards provide simple and efficient access to all the information needed to manage a safe, happy and qualified crew.
- NS Crew manager supports Management of Licenses, Endorsements, Certifications and Training.
- Users can view all crew assignments and easily locate qualified replacements for due-off crew with a single click.
- A complete employment history with the company is maintained to foster successful and productive career management and to increase retention.
- NS Crew and Payroll Manager offers a fully compliant gross-to-net payroll system developed

specifically for the challenges of maritime industry pay.

- Integration with NS HSQE Manager merges crew and safety management into a seamless process to that leads to a reduction in lost time injuries.
- NS Payroll Manager integrates with NS Crew Manager to ensure that the crew is being paid accurately and in accordance with contract and ILO-MLC requirements.
- Supports integration with financial and Accounting systems, Enterprise HR and ERP systems, Payroll tax payments and reporting and Union Contributions.
- Supports compliance with ISM, STCW, ILO/MLC 2006, TMSA, and Port and Flag State regulations. [47]

8) BUILDING A SAFETY CULTURE

Safety or environmental incidents can produce catastrophic results. The liability ship owners face for safety and environmental incidents combined with the need to demonstrate compliance with increasing regulations, requires a comprehensive compliance management process. Owners and operators need a simple and effective way to manage this process, demonstrate compliance and improve decision support.

NS HSQE Manager seamlessly integrates with NS Purchasing, Maintenance, Drydock, Crewing and Vetting Manager to drive a safety culture with a process centered on safety, risk mitigation and management of change that ensures compliance and reduces port state detentions.

NS HSQE Manager Capabilities

- Intuitive dashboards provide simple and efficient access to all the information needed to view and manage the entire safety and compliance program.
- The quality time plan displays all compliance activities performed by both crew and external auditors.
- Users have access to built-in and custom reports to easily manage internal, industry-standard and regulatory KPIs required to demonstrate compliance.
- Tools to enable Job Safety Analysis allow crew to conduct risk assessments for maintenance tasks, helping plan of these tasks in the safest way possible.

- Behavior based safety reporting encourages compliance and vigilance.
- Seamless integration with NS Drydock, Maintenance, Purchasing and Crew Managers enables implementation of a comprehensive quality and safety program.
- Supports compliance with ISM, STCW, TMSA and Quality systems [ISO 9001, 14000, etc.] [48]

9) NS CLOUD

Reliable. Easy to Deploy. Cost Effective.

The power of NS can now be harnessed in a cloud environment, making is easier and more cost effective for our customers to implement, deploy and manage the Nautical Systems Fleet Management Software.

Nautical Systems and Microsoft Azure

NS Cloud is delivered on the leading edge Microsoft Azure platform. Partnering with Microsoft ensures that our customer data is safe and secure:

- Security and privacy are embedded into the development of Azure
- Customers own and control their own data
- Customers benefit from the global network of Microsoft data centers
- The Azure platform conforms to global, US and other regional compliance standards
- Data security is always the priority

The performance you need with the compliance and security you expect from and ABS.

NS in the cloud offers Microsoft compliance and security combined with the best practices compliance and safety standards set by ABS. NS offers three service levels to meet your business needs:

Tier 1 - Hosting plus initial deployment, one patch upgrade per year

Tier 2 - Includes replication monitoring

Tier 3 - Customized application services, interface monitoring, data maintenance and creation, full internal help desk, etc.

NS Cloud easily scales as your operation grows and the NS Project Management Organization and Customer Care teams remain committed to ensuring your success with the NS software. [49]

III. DNV-GL (DET NORSKE VERITAS AND GERMANISCHER LLOYD – CLASSIFICATION SOCIETY) SOFTWARE FOR SHIP MANAGEMENT, OPERATIONS AND SHIP DESIGN

Fleet management reports and business intelligence software - ShipManager Analyzer

Fleet management reporting solution for monitoring key performance indicators (KPIs) and comparing costs and performance of your vessels

Fleet management reports

ShipManager Analyzer extracts fleet data from the other ShipManager software modules for analysis, allowing you to monitor key performance indicators (KPIs), compare costs and performance of your vessels.

Fleet management KPI analysis and more

- ShipManager utilizes the valuable data that is produced in your systems every day
- Brings important information to the attention of decision-makers
- Enables a full analysis with drill-downs, slicing, dicing, etc
- Connects data from different departments or source systems to gain insight

Effective fleet management reporting system

In day-to-day shipping operations, a vast amount of data is generated that can be used for optimization and improvement measures across the fleet. With ShipManager Analyzer software, it is possible to harness this information and use it effectively.

Shipping KPI and ShipManager Analyzer

- Automate and simplify data collection and data processing tasks involved in preparing fleet management reports, summaries, statistics, etc
- Run integrated reporting packages and dashboards for both ship management and operational needs
- Draw conclusions about fleet and vessel performance even though data is spread across numerous software systems and/or departments
- Easily compare vessels, see trends and bring together information that was not related

- Gain key information about the fleet, available on demand for decision-making support. [50]

SHIPMANAGER AND NAVIGATOR

Keeping vessels up and running 24x7x365 is a complex and challenging task. Day and night, crew and office staff around the globe ensure that materials and goods are transported in an efficient, safe and environmentally friendly manner.

With DNV GL you can manage your vessels in a smarter, greener and safer way by using our modern applications for ship management and ship operations, our well known ShipManager and Navigator systems.

1. Increase safety and compliance of your vessels
2. Increase transparency of operations
3. Show stakeholders that your fleet is well managed
4. Analyse and optimize ship management and operational cost
5. Increase productivity of your key staff
6. Reduce delays, off-hire and detentions
7. Reduce dry docking times and cost
8. Save fuel and operational cost
9. Improve your environmental footprint
10. Investment security through partnership with DNV GL

THE VALUE OF SHIPPING SOFTWARE

Shipping has always treated modern software and IT technology conservatively. Over the past few years this trend has been changing, partially driven by the increased competitive pressure and much lower rates in the market.

Our research¹ shows that

- For each USD 1,000 the oil and gas industry invests in new assets, USD 35 is invested in software technologies. In shipping, however, for each USD 1,000 CAPEX, only USD 7 are put into comparable software technologies, only 20% of the investment level of the oil and gas industry.

- Most shipping companies believe that IT is vital to implement best practice processes and ways of working.

- The ongoing change to the next management generation is lowering the barriers to more widespread use of IT systems in all departments.

The costs of modern ship management software are a fraction of costs such as:

- an unplanned off-hire day
- purchasing 3% above best market prices
- a small pollution incident
- an avoidable structural damage in critical areas
- more crew travel due to short term changes
- hiring an office assistant for compliance paperwork
- an unmanaged development of foreign exchange rates.

DESIGN PRINCIPLES

Integrated vessel system

Regular data synchronization: changes are tracked on both sides of the system, they are extracted and transported to the vessel and the office. We ensure minimal data transfer volume and maximum security for exchanged data.

Hosted office system

You do not need to worry about running a database and application server. Your office staff gets remote access to the system wherever they are, whenever an internet connection allows them to do so. We manage the application and ensure that data from the vessels arrive without problems and that IT security is at the highest standards. Our hosted server is dedicated to each client. We've been offering this service for more than 10 years and 90% of our clients use it.

Regular system updates

ShipManager and Navigator have major releases twice a year with new features and functionalities based on feedback from our extensive user community, workshops and our Customer Advisory Board. For Navigator Port we deliver weekly updated content in order to ensure that the latest nautical information is available onboard.

Downward compatibility

ShipManager and Navigator systems can always work with different versions in the same fleet. If a system update is taken you can do the update roll-out step-by step. For larger fleets this is often the only way to work.

Agile system implementation

If more than one ShipManager system is taken, the implementation is often phased, e.g. Technical and Procurement are implemented first, followed by QHSE and Crewing. The vessel client can be rolled out as full version and configured from the office system. The onboard versions of Navigator get ship-specific data from a configuration file sent from shore or manual data input. You can easily distribute hundreds of vessel systems in parallel to your fleet to speed up implementation.

User-friendly

The system is designed for crew users who do not work on the computer the whole day and often have limited training time. We have reduced overlapping windows to a minimum, so you always know where

you are working. Entry errors are checked and signaled. Users feel familiar with the style, similar to Windows Explorer. The menu presents only available options for each specific user.

A. SHIPMANAGER

Ship management solutions supporting management of vessels and fleets in all technical, operational and compliance aspects

1) ShipManager Technical

(Centrally managed maintenance system and fleetwide technical asset management supporting different maintenance strategies)

2) ShipManager Procurement

(Complete procurement solution supporting the supply chain end to end, including e-procurement for supplier interactions)

3) ShipManager QHSE

(Highly configurable QHSE solution covering all aspects of safety and compliance of a modern shipping company)

4) ShipManager Crewing

(Full crew management solution including planning, competence management, appraisals and rest hours)

5) ShipManager Projects

(Complete project management solution for dry-docking and other projects including planning, tendering and cost control)

6) ShipManager Hull

(Advanced hull integrity solution for hull management utilizing an interactive 3D Digital Twin of your vessel)

7) ShipManager Survey Simulator

(Improve competence and training for hull inspections with a 3D virtual reality Digital Twin of four different vessel types)

8) ShipManager Analyzer

(Our powerful business intelligence solution for fleetwide KPI analysis automatically extracts data from the underlying modules, enables automated reporting and gives unique operational insight for qualified decisions, improvement measures and cost savings.)

1) SHIPMANAGER TECHNICAL

ShipManager Technical is the technical management system for planned and unplanned maintenance (recognized by classification societies), technical asset and data management, as well as defect reporting. It provides the central task list for the engineers onboard and technical staff in the office. It is deeply integrated with ShipManager Procurement (spare parts purchases), ShipManager Hull (hull inspection reporting) and ShipManager Projects (for drydocking planning and monitoring).

With ShipManager Technical you can:

- centrally manage your fleetwide equipment and maintenance jobs
 - define and schedule counter-/calendar-based and condition-based tasks
 - categorize jobs and elements according to relevant criteria, such as critical, safety relevant, class relevant or origin
 - prepare and document all planned and unplanned maintenance tasks performed
 - automatically update stock counts in consideration of spare parts consumed for maintenance tasks
 - keep running hours for each equipment item individually, regardless of where it is installed
 - define different manual and automatic counters and counting directions
 - attach digital forms, manufacturer's instructions, illustrations and integrated measurement records
 - use the history to aid diagnosis and optimize maintenance management
 - check stock and create requisitions for spare parts directly with only a few clicks
 - keep a lifecycle record of each equipment and manage defects
 - exchange equipment for maintenance and overhaul without losing relevant information
- ShipManager Technical is easy to use and requires far fewer clicks and work steps than other maintenance systems. ShipManager Technical provides all information for powerful and flexible fleetwide management reporting for technical managers and their departments via ShipManager Analyzer.

MODULES:

- Fleet Equipment Register
- Planned Maintenance System
- Forms

2) SHIPMANAGER PROCUREMENT

A fleet of vessels consumes millions of USD in spares, stores, services, lubes etc. that need to be purchased and delivered. ShipManager Procurement is the system that supports purchasing departments, allowing you to work more efficiently without losing overview of the hundreds of open transactions. It prevents overordering as well as running out of stock on important items. It helps purchasers gain time on the

important sourcing part of their job and reduces the transaction processing work.

With ShipManager Procurement you can:

- purchase any type of goods and services be it spares, stores, repair services, lubes, paints, provisions etc.
 - issue and process requisitions from the vessel, which can also be created directly within ShipManager Technical
 - perform requests for quotations, compare quotations and initiate purchase orders
 - prepare templates for recurring large orders
 - track the complete supply chain via warehouses and agents until final delivery on the vessel, incl. allowing direct access to third parties, warehouses etc.
 - manage supplier contacts, contracts and supplier performance assessments
 - integrate standard catalogues (e.g. IMPA electronic data) in addition to the vessel-specific spares or company-specific stores, lubes or services catalogues
 - directly interface to e-commerce platforms, such as ShipServ
 - keep complete stock control for inventory management incl. monetary value of items in stock and history of additions and removals
 - track budget consumption per cost account/cost centre based on actual invoices and issued purchase orders (committed expenses)
 - monitor the consumption of e.g. paints, chemicals, lubes or other consumables
 - manage redeliveries for items returned or landed items from vessel
 - Supplier Portal significantly reduces the manual efforts within the order process
- The system is designed for intensive use by the purchasing departments: colour coding and hot-keys allow for fast processing of data and information. ShipManager Procurement provides all information for interactive and flexible fleetwide management reporting (e.g. budget analysis/variance, supplier performance, order/item histories, etc.) for the procurement department via ShipManager Analyzer.

MODULES:

- Supplier Portal
- Order Management
- Stock Control
- Redelivery
- Consumption
- Budget

3) SHIPMANAGER QHSE

Shipping is flooded with regulations that shipping companies comply with by means of internal procedures and guidelines. The implementation of these is regularly checked by several parties such as port states, lag states, class societies and customers, e.g. the oil majors or other charterers.

Ensuring this compliance as well as the effectiveness of management systems is the task of QHSE (Quality, Health, Safety and Environment) professionals in shipping companies. They, as all the other departments, need professional system support to accomplish their day-to-day work effectively and efficiently.

With ShipManager QHSE you can:

- report and follow up on audits/inspections, e.g. NCs, deficiencies, observations, etc. be it by external (PSC, Charterer, SIRE, etc.) inspectors or by internal auditors (ISM, Technical, etc.)
- report and follow up incidents, accidents, injuries and near-misses
- manage improvements to the QS system
- monitor the validity of vessel certificates and surveys
- manage all QHSE related documentation incl. distribution of documents to individual ships, acknowledgement of new documents onboard (read receipt), revision control and approval workflows
- schedule, document and monitor performance of drills, exercises, safety meetings and other safety tasks
- create, distribute and manage risk assessment templates across the fleet
- monitor risk levels and work permits to improve the safety
- see the status of your class certificates and surveys also onboard (for DNV GL vessels only)

ShipManager QHSE is highly configurable to your own safety management system. You can use your own terms and structures from your existing safety management manual and related documents in ShipManager QHSE. The existence of a full onboard version allows complete integrated workflows from vessel to office to vessel, etc. ShipManager QHSE enables comprehensive, flexible and fleetwide reporting for the QHSE department with ShipManager Analyzer.

MODULES:

- Supplier Portal
- Order Management
- Stock Control
- Redelivery
- Consumption
- Budget

4) SHIPMANAGER CREWING

Qualified crew is hard to find and to keep. That is why a number of shipping companies take back control of many crewing processes while maintaining collaboration with crewing agencies around the globe. Ship-Manager Crewing is made to support the complete crewing process across the entire crew pool.

With ShipManager Crewing you can:

- run fleetwide crew planning/scheduling processes and optimize crew deployment in line with safe manning requirements and company policies
- easily find crew members qualified to fill vacant positions due to automatic matching of position and crew member qualifications

- collaborate with crewing agencies to supply crew to certain positions in the same system
- keep a complete crew database with comprehensive crew member records
- manage certificates, licenses, qualifications, experience, competences and contracts
- have all these key crew data accessible onboard for current and past crew
- prepare wage settlements according to different tariffs, CBAs, etc.
- perform appraisals on individual crew performance
- report work and resting hours with alerts to nonconformities according to the latest regulations
- manage the ship cash box for cash advances, Master's cash accounts and the onboard slop-chest
- run helpful reports, serial letters and certificates directly out of the system ShipManager Crewing is easy to use, highly configurable to your own environment and wording and supports the global collaboration between shipping company, crewing offices and crew agencies.

MODULES:

- Crew data
- Crew planning
- Crew Resting Hours
- Appraisals
- Canteen
- Ship Cash Box

5) SHIPMANAGER PROJECTS

Drydocking is the biggest maintenance cost block for shipping companies. These projects, as well as comparable technical projects such as retrofitting, need to be supported by a professional project management system that is integrated with your other technical management and planned maintenance system.

With ShipManager Projects you can:

- collect work items to be performed in drydock from different sources, such as the planned maintenance system, or free-item lists
- create templates for different ship types or drydocking tasks from scratch or prior dockings
- manage requests for quotations from yards (locations) and suppliers
- compare prices and select the best yard/supplier combination for the project
- do project management and controlling during the drydocking, including progress monitoring and budget control
- develop a history of drydock projects, parts of which can be flexibly re-used for future drydock projects

The onboard and the office systems work closely together to allow integrated processes between the engineers and nautical staff on board and in the office. Integrated Excel import and export allows easy collaboration with yards and suppliers and usage of existing drydocking work templates.

MODULES:

- Item collection
- Templates
- Tenders
- Project Plan

6) SHIPMANAGER HULL

Maintenance work and supporting IT systems have traditionally focused on machinery items, but shipping companies are increasingly looking for professional support also for their steel structures. This

has been less based on the fact that hull integrity management systems reduce the probability of structural failures or the risks of pollution and water ingress and resulting reputation damages, but in most cases it is simply to save costs in the next drydocking. Early detected corrosion and re-coating needs can easily be addressed between drydocking intervals.

ShipManager Hull is the most advanced hull integrity management system available today.

With ShipManager Hull you can:

- define inspection strategy, plan and perform inspections,
- document inspection results in a vessel-specific 3D digital twin for interactive use (i.e. mark observations and defects directly in the model), allowing for easier orientation and easier “finding” of problem areas again
- annotate reports by adding text descriptions and pinning photos directly on the model
- comment and approve/reject inspection results from the office
- issue unscheduled inspections from vessel and office
- integrate thickness measurements in the 3D digital twin
- assess hull condition according to various criteria, e.g. coating, corrosion, cracks, etc.
- perform a steel weight and surface area calculation in advance of a drydock tender based on the specific hull condition of the vessels
- use mobile onboard device for direct input of inspection data in compartments

The system is very intuitive and fully integrates with the planned maintenance system for common view on jobs and repairs.

MODULES:

- Schedule
- Status
- Repair
- Reports
- Documents
- Risk Management

7) SHIPMANAGER SURVEY SIMULATOR

Virtual reality for hull competence

The Survey Simulator system revolutionizes the development of inspection competence (e.g. hull) for onboard crew and

office staff. In a virtual 3D world, decades of experience of DNV GL surveyors can be used in classroom training. The Survey Simulator is an effective training environment that uses highly realistic models, making practical training possible without leaving the classroom. Different vessel types are available for virtual survey with areas and spaces specific for each type (cargo holds, tanks, decks).

With Survey Simulator you can:

- simulate a step-by-step inspection, including where to focus your attention, i.e. where hull structural deficiencies are likely to occur
- use a set of real life tools relevant for documentation and report inspection results
- use photo-realistic textures placed on exceptionally detailed 3D digital twin with thousands of real life deficiencies
- simulate real time coating condition degradation
- adjust survey conditions to increase inspection difficulty level
- use built-in safety at work scenarios

Survey Simulator software makes training more efficient, attractive and practical. It also provides a tool for everyday use for professionals who need to know everything about the vessel before they step on the deck. The simulator can also establish an interactive collaboration workspace for individuals working upon the same problem at a distance, meeting onboard the ship in shared virtual reality.

Survey Simulator is optimized to run on an ordinary laptop used by surveyors every day. It is suitable for use at small offices, even one-man stations, and onboard vessels. At the same time it has functionality to support the systems of advanced training centers with cutting-edge projection, offering amazing 3D and sound effects.

8) SHIPMANAGER ANALYZER

All ShipManager systems support a complete set of a shipping company's processes. While doing this, they produce valuable data: who your most important suppliers are, their delivery performance, how they have been rated and which safety-relevant jobs are open before an important audit.

This important information needs to be brought back to the users and decision-makers.

With ShipManager Analyzer you can:

- automate and simplify data collection and data processing tasks involved in preparing management reports, summaries, statistics, etc.
- run integrated reporting packages and dashboards for both management and operational needs
- do a full analysis with drill downs, slicing, dicing, etc. and connect data to gain insights – or choose analysis dimensions on the fly
- Draw conclusions about fleet and vessel performance even though data is spread across numerous software systems and/or departments
- Easily compare vessels, see trends and bring information that was not related together

- Gain key information about the fleet, available on demand for decision-making support
 - Use reporting packages for flexible analysis fleetwide for each department, such as Technical Management (e.g. maintenance/overdue performance, defects KPIs), Procurement (e.g. budget, supplier performance KPIs), QHSE (e.g. incidents, findings, causes, LTIF), Crewing (e.g. training, sick leave, crew agency performance KPIs), Performance (e.g. EEOI, speed profiles, bunker usage)
 - Integrate different information sources in your reporting packages, including third party sources
 - Develop reporting packages based on our standards or according to your own requirements
- ShipManager Analyzer can be used as a departmental or company-wide business intelligence system. It allows browser access independent of access to the source system, such as ShipManager. It sits on top of all ShipManager systems and your own data sources, whose data can be combined to gain insights.

MODULES:

- Technical
- Procurement
- QHSE
- Crewing

B.NAVIGATOR

Ship operations solutions supporting port clearance, vessel efficiency, safety and compliance

1) Navigator Port

(The master's digital assistant for port clearance, including up-to-date port information and forms, passage planning and rest hours compliance)

2) Navigator Insight

(MRV ready reporting solution covering operational needs. Feeds data to different stakeholders in addition to the ECO Insight fleet performance portal)

1) NAVIGATOR PORT

A Master's day is becoming increasingly filled with paperwork and less with nautical matters. Navigator Port reverses this trend. It assists the shipmasters in carrying out the planning and preparation of documents needed for entry and departure from ports and sailing through controlled waters. All the related tasks can be carried out in a timely and correct manner. The arrival and departure checklists are unique to each and every port and regulated waters. Add-on modules help to keep track of work and rest hours and allow complete passage planning documentation.

With Navigator Port you can:

- rely on up-to-date information on 13,000 ports, terminals and pilot stations, the latest UKHO's

Admiralty List of Radio Signals Vol. 6, the complete IHS Fairplay's Ports and Terminals Guide and information from IMO and national authorities

- prepare for port arrival and departure with the latest arrival/departure checklists for more than 3,500 ports and more than 1,600 different forms that are automatically pre-filled with e.g. ship information and crew data

- perform electronic reporting directly to authorities, including US eNOAD report

- transfer the Officer Matrix via Q88's web service to OCIMF – SIRE

- use a comprehensive nautical library providing up to- date maritime-specific information and detailed references regarding relevant regulations

Navigator Port content is updated weekly to ensure the latest information status onboard your vessels. It can be run as an onboard-only system, or with an office component. Navigator Port easily integrates with ShipManager Crewing or your own crewing system for exchange of relevant crew information. There are three widely used add-ons available:

- a complete Work & Rest Hours systems, according to the latest MLC guidelines, enabling content and non-conformities to be monitored from the office

- a complete passage planner and documentation module according to IMO Resolution A.893(2), Guidelines for Voyage Planning, the ICS Bridge Procedures Guide and relevant international and national legislation

- a web-based shore module provides data and statistics from fleet to management

MODULES:

- Port Clearance
- Port Information
- Crew data and logs
- Library
- Work & Rest
- Passage planner
- Shore
- Web portal

2) NAVIGATOR INSIGHT

The quality of operational data is essential for fleet performance analysis and is a challenge without an intuitive system implemented onboard with proper plausibility checks. Navigator Insight brings traditional ship-to-shore reporting systems into one user-friendly solution that complies with the EU-MRV regulation. Improving operational performance of your fleet, measured in fuel consumption, total operating costs and environmental footprint, is only possible based on quality data and analysis.

High quality voyage data management is also essential for all required reporting for to charterers, cargo owners, NGOs such as ESI or CCWG and for the EU's

MRV scheme (monitoring, reporting and verification of emissions) as well as the upcoming IMO DCS data collection system for fuel oil consumption of ships).

Navigator Insight helps ship owners and managers to ensure data quality for unique fleet performance analysis. The system provides an onboard module for structured and harmonized data reporting with intelligent validation that instantaneously alerts officers of potential reporting errors or implausible data. Event-based reports are logged on the onshore server for further evaluation. All required data can be sent automatically to various stakeholders, such as the operation department, technical and fleet management or third parties such as agents, charterers, etc.

The data collected onboard in Navigator Insight can easily be presented in DNV GL's performance management portal, ECO Insight. ECO Insight provides comprehensive performance dashboards, benchmarks and industry data such as AIS, fuel quality or weather data. Combined, you have all the information for industry best practice performance management.

Key benefits of Navigator Insight:

- Complies with EU-MRV requirements
- Comprehensive plausibility checking and data quality/consistency assurance against ship-specific technical data
- Onshore system collects data for the entire fleet in operational reports (log abstracts, noon, departure and arrival, bunker, ballast water operations, disposals and many more) and management reports, for example EEOI for fleets
- Allows comprehensive fleet performance monitoring with in-depth analysis
- All information is structured for re-use in any type of analysis or reporting to stakeholders
- Supports environmental reporting schemes such as CCWG, CSI and ESI
- Core set of voyage reports from departure to arrival with all relevant and industry standard parameters from both nautical and technical officers
- Fully integrated bunkering and ROB management
- Supports data integrity and quality with more than 450 ship-specific plausibility checks
- Easy and fast fleetwide implementation

With its intuitive workflow and intelligent data checks, Navigator Insight strikes the balance between completely manual reporting systems, which often suffer from data quality issues, and less controlled automated performance monitoring. It is simple to use without onboard training needs and easy to implement across your fleet. You can further integrate this information into your internal processes.

MODULES:

- Voyage administration
- Ship general data
- Event reporting
- Fleet voyages/status
- Dashboards
- EU-MRV Reporting

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IV. ULYSSES-SYSTEMS

1) Shipping Solutions

The full suite of Ulysses Systems Task Assistant® Shipping Solutions comprises of Safety & Quality Document Management, Planned Maintenance, Purchasing and Crewing.

User convenience is the key to our marine solutions and to significantly reduced software lifecycle costs. Using highly configurable Task Orientation, the navigational layout of Ulysses applications matches the way each seaman and his manager think through a process.

Information Delivery

Task Assistant® Shipping Solutions offers the multi-tasking personnel of the shipping industry automatic indexing, storing and delivery of actionable information cross functionally and vertically.

Within a culture of continuous improvement increasingly emphasized in the marine industry and actively promoted by regulating bodies and governments, ship management can rely on:

- Coordinating day to day operations seamlessly
- Complying with external regulations such as ISM, TMSA and ISO etc.
- Minimizing training expenses
- Maximizing familiarization of new personnel with the company Safety Management System
- Achieving managerial self-improvement targets
- Demonstrating competence and process control

2) Safety and Quality

Task Assistant® Shipping Solutions for Document Management

Task Assistant® Shipping solutions for Document Management is the award winning software application designed to assist companies implementing consistent processes that ensure adherence to regulations. In addition the application provides total management support for ship operations, consistent with all the safety and quality management requirements issued by governments and

regulating bodies and assists office and shipboard staff with inspections by customers and regulatory auditors.

Product Features

- Task trees customizable for each Role and User.
- Personal Username and password accessing system, with the ability to view/control/access other Roles depending on customizable authorization levels.
- Particular System (ship/office)/ Role/ Task/ Context and voyage specific information.
- Ability to integrate all your SMS systems, ISPS and any electronic based static information available to your company.
- Ability to navigate through specific manual sections related to each task and context, customized according to the company's needs and/or requirements.
- Advanced Word search facilities for manuals.
- Automated ship to shore communications managing the full documentation (manuals, forms, check lists etc.) requirements of ISM, TMSA, ISO etc
- Pre-configured workflows for ship to shore reporting.
- Electronic distribution of manual updates and forms/checklists updates (Version Control).
- Form search facility per Role and Facility for Review of Completed Forms
- Scheduled forms
- Support of Info Path Data forms for cheaper transmission and statistical analysis of data.
- Occurrences Reporting, Risk Management and Closeout

Task Assistant® Technical and Operations Reporting Module (TORM) allows for the automation of the Noon Report providing comprehensive information according to charter-party requirements including abstract and extract reports. TORM is fully configurable to customers' requirements.

- Intuitive user interface for comprehensive data input and collection
- Role/task configuration follows voyage sequence.
- Consolidated list of required reports

3) Task Assistant® Shipping Solutions for Planned Maintenance

Task Assistant® Shipping Solutions for Planned Maintenance enable fleet operations department as well as vessel personnel, to monitor and assure that all the information required to perform consistent and accurate vessel maintenance are delivered in a timely fashion.

Product features

- Pre-configured Roles, Tasks & Workflows required for execution and management of the Planned Maintenance process.
- Task trees that are customized for each role and user
- Set-up of components, activities and spares
- Critical Spares Management
- Scheduling activities by calendar or running hours
- Long-term view of the maintenance schedule
- Comprehensive recording and reporting facilities
- Reporting, analyzing and scheduling defects
- Current Work Plan Management including assigning and altering of jobs
- Maintenance Completion Reporting (with comments and spares usage) Maintenance History Viewing and comments related to jobs
- Ability to plan and schedule for Dry Dock, Survey, etc.
- Integration with Purchasing Application for efficient replenishment and management of spares inventory.

4) Task Assistant® Shipping Solutions for Purchasing (Purchasing Module)

Task Assistant® Shipping Solutions for Purchasing automates many of the semi-manual processes that add to the high cost of processing Purchase Orders.

Product features

- Pre-configured Roles, Tasks & Workflows required for execution and management of the Purchasing process.

- Task trees that are customized for each role and user
- Spares and stores requisitioning
- Service requisitions
- Request for quotations (RFQs)
- Vessel direct requisitioning and RFQs
- Approval work flows for selection, pricing, vendors, etc.
- Purchase orders
- Recording delivery and updating status of requisitions, orders and inventories
- Invoicing - linking invoices to issued purchase orders
- Accrual report for period - Unpaid issued purchase orders
- Visibility into Requisition and Purchase Order status both on-board and in the office.
- Vendor management
- Integration with Planned Maintenance Application to provide consistent view of spares inventory both on-board and in the office.
- Ability to integrate with Accounting systems.
- Ability to integrate with e-Procurement sites using MTML.
- Capability for manning agents to log into the application to create, edit and submit prospective crew members' CVs.
- Crew availability displays: matching available crews to vessels
- Integrated Crew Schedule
- Crew List generation in various formats required by Local Authorities and/or according to client's requirements
- Integrated e-NOA/D required by the US Coast Guard.
- Crew sign on/off with ability for masters to implement contractual crew terms and conditions of employment
- Master's General accounts for cash accounting, salaried and contractual personnel
- Cash transactions
- Crew wages showing monthly
- Bond sales with close integration to inventory management in Purchasing Module
- Ship-side closing which queues ship account information and wages for transmission to office system
- Office-side crew wages and cash balance support
- Office-side monthly account closing
- Office-side wages management

5) Task Assistant® Shipping Solutions for Crewing (Crewing Solutions)

Task Assistant® Shipping Solutions for Crewing enables the structured review of all aspects of crew management as well as the tracking of mariners throughout the interaction between the mariner and his employer or contractor.

Product features

- Task trees that are customized for each role and user
- Full support for crew recruitment process and approval stages.
- Crew Management component for creating, editing, reviewing and submitting comprehensive crew records as well as monitoring crew complements including supernumeraries.

6) Ship Energy Efficiency Management Plan (SEEMP) Management

Ulysses have been building software for compliance and on board technical monitoring for 14 years. We have adapted these tools recently to apply to SEEMP which is both compliance and monitoring requirement as of Jan 2013. We have two versions.

1. A ship owners version of SEEMP for full commercial technical and crewing management
2. A technical managers view of SEEMP with time charter and spot charter clients

7) Data Warehouse

To fully realize the value of data, you need a complete platform that can manage both structured and unstructured data with security, consistency and credibility. Ulysses

Systems® Data warehouse solutions provide a trusted infrastructure that can handle all types of marine data and indexed to the company activity model to provide meaningful alerts and warning to the senior management.

Features

- Congregate data from multiple sources into a single database so a single query engine/application can be used to present data.
- Maintain data history.
- Integrate data from multiple source systems, enabling a central view across the company.
- Improve data quality by providing consistent codes and descriptions, flagging or even fixing bad data.
- Present the organization's information consistently.
- Provide a single common data model for all data of interest regardless of the data's source.
- Restructure the data so that it makes sense to the business users.
- Restructure the data so that it delivers improved query performance, even for complex analytic queries, without impacting operation system.
- Make data-related queries easier to write.
- Map the data to a meaningful activity model so that managers and developers understand where the data is coming from.
- Deliver alerts based on a cause and effect model so that you can predict failure or potential threats based on collected data.

8) Task Assistant® Shipping Solutions for Certificates Management.

Task Assistant for Certificates, Surveys, Audits and Inspection Management is one of a series of custom-designed Data processing Applications designed on the award winning Task Assistant® Platform. The Task Assistant works by assembling all the users' information-processing requirements for each complete maritime business task and delivering this information at the point of need.

Product Features

- Task trees that are customized for each role and user
- Facilities to design Certificate templates to re-use when setting up a large fleet of ships.

- Facilities to design Scheduling templates to link to Certificate Classes.
- Facilities to Manage Surveys.
- Ability to Manage Certificates of Specific Components.
- Ability to Manage Medicine Cabinet Certificates
- Ability to Have Initial Periods for Certificates and different follow-up Periods
- Ability to Manage Dry-Dock Certificates
- Ability to Manage Endorsements and Visas.
- Ability to Manage Conditions of Class.
- Facilities to have Vessel only Certificates.
- Abilities to link Scan Documents and Other Attachments to Certificates.
- Ability to create and Organize Inspections (Internal, External Audits and Link to Survey Items or Certificates that will be passed).
- Abilities to Coordinate Surveyors and Auditors with Inspections.
- Ability to manage the Status/Preparedness of a Ship for an Upcoming Survey or Inspection.
- Integration with Task Assistant Reporting Module to Design and Implement reports and KPIs.
- Integration with Document Management to allow for relating audits and inspection with document management forms.
- Alerts and Alarms to warn User when certificates are due for renewal.
- Facilities to Archive old Certificates.
- Workbench facilities that allow the office users to create and set-up schedules and certificate classes without needing any specialized IT training.

9) Task Assistant® Shipping Solutions for Work Rest Hours.

Task Assistant® for Working/Rest Period is one of a series of custom-designed data processing (Task Assistant for Maintenance and Task Assistant for Purchasing). The Task Assistant works by assembling all the users information-processing requirements for each complete maritime business task.

Product Features

- Full integrated with Crewing module
- Full Integration with the Maintenance Module. Maintenance jobs (Scheduled, Unscheduled) information per day in all timesheets
- Crew onboard timesheets recording.
- Allows users to both plan in advance and to record hours in the present, with confidence that potential non-conformities are highlighted and explained.
- Ability for multi-Crew reporting timesheets.
- Ability for multi-days reporting timesheets per Crew.
- Ability to add patterns (shifts) of working hours per Rank.
- Real time compliance testing for regulations (STCW Manila 2010).
- Per-half-hour identification of non-conformities.
- Navigating through monthly timesheets per Crew.
- Reporting with build in export capability (PDF, Spreadsheet etc.).
- Comprehensive security including timesheet locking.
- Crew time sheets for all ships are available in the Office side.
- Bulk Data transfer of Crew timesheets to office.
- Integration with the TA event Management Sub-Module to Produce and Configure Customizable Alerts at the point of Need.
- Customizable Alert Based Crew Planning Facilities.
- Integrated advanced Search facilities.
- Full Integration with the Task Assistant Reporting Module that allows customer specific reports.

10) Task Assistant® Shipping Solutions for Meals and Beddings.

Task Assistant® for Bed and Meals is one of a series of custom-designed data processing (Task Assistant for Maintenance and Task Assistant for Purchasing). The Task Assistant works by assembling all the users' information-processing requirements for each complete maritime business

task.

Product Features

- Full integrated with Crewing module.
- Tracking of Meals served to Full Time crew.
- Tracking of Meals served to Supernumeraries.
- Creating People on-Board Categories based on billable policy.
- Relating Supernumeraries to a specific People on Board Category.
- Customize billable policy per Supernumerary.
- Tracking meal types like breakfast, lunch etc.
- Tracking of bedding used for company crew.
- Tracking of bedding used for Supernumeraries.
- Daily and Monthly Reports showing consumption totals for meals.
- Integration with the TA event Management Sub-Module to Produce and Configure customizable Alerts at the point of need.
- Providing bed and meals daily data to the office side.
- Integrated advanced Search facilities.
- Full Integration with the Task Assistant Reporting Module that allows customer specific reports.

11) **Task Assistant® Reporting Module (TARM)** is fully integrated with the Task Assistant® Platform database. This module facilitates the collection of information and data from different business units submitted via the integrated platform products and/or 3rd party products. For example data submitted by the vessel or the office via our Shipping Solutions (Document Management, Planned Maintenance, Purchasing and Crewing) can be extracted by TARM, collated and stored in order to produce reports assisting in Accident and Incident Analysis, Undesired Events Statistics, Regulatory and Company KPI's etc.

The **Task Assistant® Reporting Module(TARM)** provides

- Complete facility for installation and configuration of company reports.
- Autonomy in modifying company reporting requirements.

- Assures management overview via near real time performance Data Repository.
- Assures identification of trends and areas for process improvement.

The Task Assistant® for Technical Operation Reporting Module (TORM) is one of a series of Voyage Data Reporting Forms and Reports. The Task Assistant works by assembling all the users' information-processing requirements for each complete maritime business task.

B. Product Features

The Technical Reporting Module is used on board and ashore and provides the following high level functionality:

- Task trees that are customized for each role and user
- Deck Abstract Reporting
- Engine Abstract Reporting
- ROB reporting
- Management of NOx and SOx reduced fuels.
- Arrival Report
- Departure Report
- Stoppages
- Port Consumptions
- Ship Sea Trial and Other Fixed Data Performance for Comparison
- Charter Party Agreement details for comparison.

C.

Task Models

1) Complete Noon Report

Available to the Master and Chief Engineer and any other Shipboard officer that is required to complete the noon report on the ship. The reports include the following:

- Noon Position.
- Daily Consumptions.
- Daily ROBs.
- Main Engine Details and Temperatures.
- Main Engine Pressures.

- Main Engine Turbocharger Details and Temperatures.
- Auxiliary Engine Details and Temperatures.

2) Complete Arrival Reports

Available to the Master and Chief Engineer and any other Shipboard officer that is required to complete the Arrival Report on the ship. The reports include the following:

- Arrival Information.
- Voyage Data.
- Arrival ROBs.
- Total Consumptions.
- Arrival Calculated Consumptions.
- Arrival Daily Consumptions.
- Arrival Stoppages
- Arrival Special Requirements.

3) Reporting Departure Details

Available to the Master and Chief Engineer and any other Shipboard officer that is required to complete the Departure Report on the ship. The reports include the following:

- Departure Information.
- Charter Party.
- ROBs.
- Load Discharging Details.
- Crude Oil Washing Time.
- Steaming Time.
- Anchoring Time.

4) Voyage and Cargo Scheduling

Available to the Office personnel required to manage/view the voyage and Cargo schedule of ships. The reports include the following:

- Voyage Details Recording.
- Cargo Details Recording.

5) Define Ports/Regions/Countries and Contacts.

- These are in fact a number of tasks that are available to office personnel to be able to record and describe each voyage, cargo and ports that the ship will be visiting.

6) Reporting

This Module is fully integrated with the Task Assistant Reporting Module (TARM). It has a number of built in reports but these can easily be extended using TARM.

- Export of report details to excel spreadsheets.
- Export of report details to crystal reports graphs.
- Departure report.
- Arrival Report.
- Voyage Consolidated report (Engine and Deck).
- Deck Abstract.
- Engine Abstract.

7) Manage TORM Fixed Data

Available to the Office personnel required to administer the fixed data that TORM uses to produce the Performance Reports. This data includes things like:

- Vessel Specification/Manufacturer Consumption and Power Details.
- Average/Consumptions.
- Main Engine/ Auxiliary Engine/Boiler/Turbocharger and Cargo tank details. [52]

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