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SHIP INFORMATION SYSTEM

NAVANTIA'S IPMS is much more than a Machinery Control and Surveillance System, it is a **Ship Information System** designed to **increase Operational Availability** and **optimize** the **Life-cycle costs** of a warship by:

- Establishing the necessary criteria to prioritize maintenance tasks and avoiding unnecessary tasks
- Predicting situations that produce down-times , affecting the ship's crew and avoiding catastrophic failures
- Minimizing down-time durations by dynamically managing alongside tasks based upon expected system diagnostics
- Updating operating procedures based upon analysis of incidents that affect operational availability

Additionally Navantia's *COMPLEX* software assists traditional preventive maintenance, by recording equipment's running hours, and sending it to logistic support applications, for example NAVANTIA's *EOLO*, and provides real-time predictive or **Condition Based Maintenance**, by measuring parameters such as vibrations in rotary equipment, oil condition for lubricated equipment, cylinder pressure for diesel engines (P-V diagrams), etc. Other parameters can be analyzed at an On-Shore Centre using 'data mining' techniques, which are able to extract information that is hidden in the data, based upon artificial intelligence and statistical analysis. COMPLEX is able to send the data from the ship, including via satellite, to the Navy Base.

FUNCTIONS



- 2D and 3D Views

- Navantia Damage Control
- Information System (NADCIS)
- Damage Plot
- Stability and Strength Calculations
- Personnel Location System
- Optimum Routes
- CCTV Interface
- 360° Panoramic Views
- Dynamic Killcards
- Check Lists
- Predefined Configurations
- Alarm Viewer
- Playback Mode
- Sailing Mode
- Message Handling System
- Documentarium
- Data Logging
- Report Generation

EVOLUTION



HARDWARE AND SOFTWARE



- Based on PCs, they provide the interface between operators and the IPMS, thus allowing remote Monitoring and Control of the platform.
- Operator Stations are multifunction. All systems can be controlled from a single Station, or responsibilities can be shared by several Stations working in parallel.

LOCAL SUB-STATIONS (LSS)

- Based on PLCs, they constitute the interface between the IPMS and field. They also execute the automatic control functions. Every sensor and actuator is connected to these LSSs (hardwired or via communication link).

REMOTE TRANSMISSION UNITS (RTU) & LOCAL OPERATING PANELS (LOP)

- RTUs and LOPs are distributed throughout the vessel, collecting and transmitting information from/to the different sensors and actuators.
- Local control from LOPs co-exists with remote control from IPMS. Selection is performed from LOP's "L/R" switch.

DATA TRANSMISSION NETWORK

- It provides a High Speed backbone to connect every IPMS equipment, and ensures the sharing of all the information. Dual network connections.



The IPMS is developed based on Commercial Off The Shelf (COTS) components:

Commercial HARDWARE.

- PLC for input/output and control process
- LAN and Industrial Field Bus for communications
- PC for Human-Machine Interface

Commercial SOFTWARE.

- PLC manufacturer programming tools
- Windows or Linux Operating System
- COMPLEX SCADA developed with commercial software tools

TRAINING





- Readiness

- System manning

- Analysis

NAVANTIA TRAINING INTEGRATED SYSTEM (NAVANTIS)

- Combined IPMS and Navigation virtual simulator. Unifies crew's Engine Room, IPMS and Bridge training, including:
 IPMS 2D and 3D views
- Navigation Chart
- Engine Room Controls
- Recreates real weather conditions
- Connects with Combat System simulators, allowing integrated ship wide training
- Interconnects different ship simulators, allowing simultaneous ships crews' training

ABOUT NAVANTIA

Navantia is a Spanish Government Owned Company and is an Industrial Group with the following Business Lines:

- - Naval shipbuilding and design.
 - Systems.
 - Ship repairs and conversions.
 - Diesel engines, gearboxes and power generation.
 - Through Life Support.
 - Transfer of Technology solutions
 - Offshore merchants and wind energy

Command and Control systems Integrated Platform Management Systems Surveillance systems Gun Fire Control Systems Naval guns Communications systems Navigation systems Simulators and training

More than 20 countries...

> ...with offices worldwide

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