SIREHNA

HULL AND MOTION MONITORING SYSTEMS

FOR THE FRENCH NAVY AMPHIBIOUS SHIPS

«MISTRAL» AND «TONNERRE»

System description – Main characteristics

- Measurements and acquisition of data related to strains in the hull and to motions in various ship locations,

- Real time data processing to derive relevant criteria for the ship navigation and helicopter operations,

- Display on Navigation and Avia bridges of corresponding relevant criteria,

- Storage of raw and processed data for post-processing,

- System based on existing HULLMOS® system and adapted to the ship operations specificities,

System Description – Main components

- Central unit : HULLMOS LAN management, data processing and storage, driving of NAV and AVIA MMI, interface with ship LAN (NAV1 for motions and WIND), Ethernet connection for external system,
- ARCNET LAN (cables and hubs) : power supply/configuration of sensors and data acquisition,
- Five strain sensors SBSG (Short Base Strain Gauge) : measurement of monodirectional strains in five ship locations around midship,
- Two vertical accelerometers at ship bow and stern,
- Motion data (motion, speed and accelerations at user defined ship points) derived from NAV1 data (heading, roll, pitch, heave, position, speed, UTC time),
- Two remote displays: on NAV bridge and on AVIA bridge
- Real time sea state estimation from recorded ship motion using SSE (Sea State Estimator) module; combination with bending moment transfer function for real time estimation of bending moment and comparison with strain measurements

French Navy amphibious ships « Mistral » and « Tonnerre »

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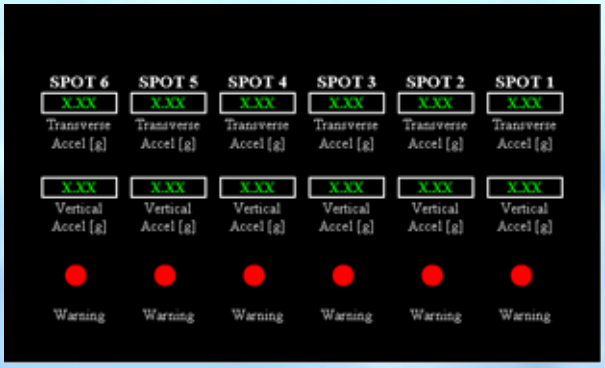
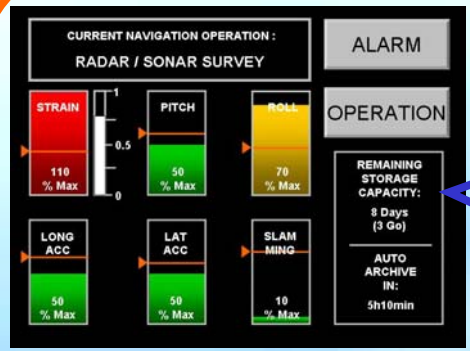


AVIA

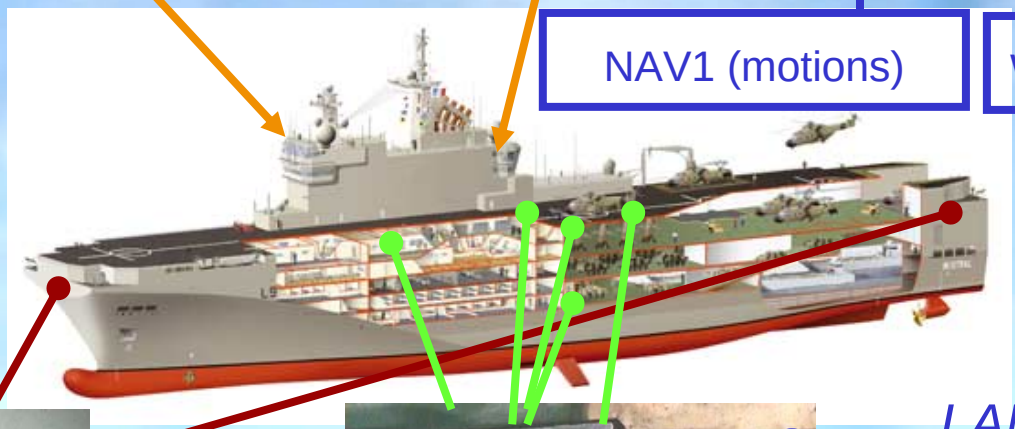


NAV

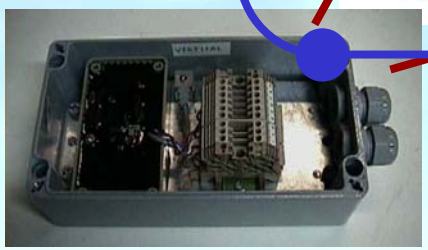
Ethernet

NAV1 (motions)

WIND



LAN



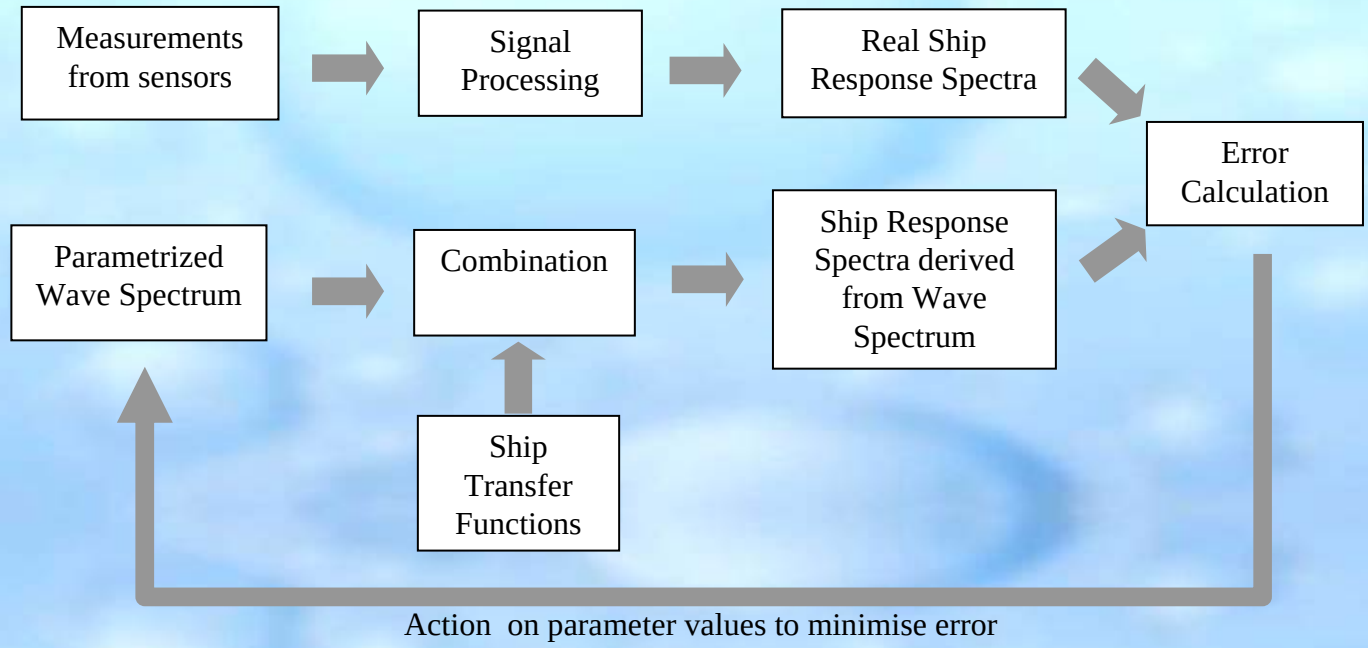
Vert. accelerometer

Strain gauge sensor

Hull & motion monitoring system for NAV and AVIA operations

Sea State Estimator

Principle



- Use of classical wave spectra with 3 to 5 parameters (Hs, Tp, direction, frequency dispersion, incidence dispersion)
- Possibility to search for two superposed wave spectra
- Optimisation process adapted to the specificity of the present problem :
  - Local Search
  - Global Search

Sea State Estimator

MMI