Research Ship Management Strategy and Innovative Engineering Solutions

This paper discusses about ship management strategy and various innovative engineering solutions implemented for improving the performance of Oceanographic Research Vessel (ORV) SagarNidhi. The key focus techniques viz., Energy management system (EMS), Ballast water management (BWM) and Integrated automation (IA will be covered. Energy management system collects the data from major ship equipments viz., Engines, Propellers, Thrusters, HVAC and Deck machineries. This data is plotted in a graphical format along with historical bench mark. Factors such as ship operations, ship conditions and fuel management are considered for energy saving. Implementation of Energy management system onboard Sagarnidhi complies with Ship Energy Efficiency Management Plan (SEEMP) - a regulation set by International Maritime Organization (IMO). The Ballast water management system provides stability, improves propulsion, manoeuvrability and prevents the transfer of aquatic micro-organisms. Integrated automation takes input from sensors, radar and satellites. It optimizes performance, reduces over all ship operation and maintenance cost, improves efficiency, reliability and safety. Apart from these merits, the overall advantages are as fuel savings, reduction in harmful pollutants viz., SOx, NOx, CO, CO2 etc., and enhancing ship utilization by minimizing time required for operation and maintenance. The innovative engineering solutions implemented onboard ORV Sagarnidhi enabled highly reliable Position keeping. Use of Nano-materials blend for reducing ship emission, development of innovative model for reducing NOx/SOx in ships as part of Green Technology and Energy efficient parallel pumping system in Ballast water management for reduction of ship emission. In this paper individual Technology/Management strategy and its merits are explained in detail.