





Hu Jintao President of SDARI

Background



Background

FUEL AND ENERGY EFFICIENT

ENVIRONMENT-FRIENDLY AND PREPARED FOR FUTURE REGULATIONS

OPERATIONAL FLEXIBILITY AND MAINTENANCE FRIENDLINESS

GREEN DOLPHIN 575

SAFE, ROBUST AND RELIABLE





DESIGN TECHNICS







Technics of Improving Performance

- Ship Lines Optimization Taking Into Account Added Resistance
- Optimization of The Whole Integrated Propulsion System
- Decreasing Hull Resistance by Using Air-Lubricating System
- Increasing Propulsion Efficiency by Asymmetric Aft Body



all man and the second sector a Risk-Based Ship Design and FSA



Ship Lines Optimization Taking Into Account Added Resistance





Optimization of The Whole Integrated Propulsion System





Decreasing Hull Resistance by Using Air-Lubricating System



Increasing Propulsion Efficiency by Asymmetric Aft Body



Asymmetric Aft Body Courtesy: MARIN Asymmetric Rudder Bulb Courtesy: HSVA

Due to the rotation of the propeller, the flow is not symmetric around the aft body. Asymmetric aft body or asymmetric rudder bulb may pre-swirl or postswirl the flow, then recover and reduce the rotational energy loss inside the propeller outflow.



Risk-Based Ship Design and FSA (Formal Safety Assessement)

FSA is a structured and systematic methodology, aimed at enhancing maritime safety, including protection of life, health, the marine environment and property, by using risk analysis and cost benefit assessment. FSA can be used as a tool to help in the evaluation of new regulations for maritime safety and protection of the marine environment or in making a comparison between existing and possibly improved regulations, with a view to achieving a balance between the various technical and operational issues, including the human element, and between maritime safety or protection of the marine environment and costs.

Alternative design may be acceptable based on FSA's procedure and spirit. That may extend the flexibility of ship design without hurt the goal of safety and/or environment protection.





DESIGN TECHNICS







High Ductility Steel Improving Safety

Anti-corrosion Steel Reducing Coating Cost And Improving Safety

Composite Materials Cutting Lightship Weight



Highly Ductile Steel Improving Safety







Anti-corrosion Steel Reducing Coating Cost And Improving Safety

Corrosion speed is much slower than that of normal steel

Already used and being tested on the oil tanker 'DA QING 435'

It may reduce the coating's painting and maintenance cost

Carbon Fiber Propeller

More other materials may be used on ships



Denter of the Am De



Composite Materials Cutting Lightship Weight



GRE/PE Pipes

Sandwich Panel

Carbon Fiber Propeller

More other materials may be used on ships









DESIGN TECHNICS







Heat Balance and Recovery of E/R

Emission Control Equipments

New and Renewable Energy Resource

About CSSC Intelligent Ship



Heat Balance and Recovery in E/R





Emission Control Equipments



For SOx emission control, using low sulphur fuel oil or scrubber would be A long-term question for owners considering more EC and global 0.5% sulphur requirements are coming.

For NOx emission control, whether to select EGR or SCR is still very challenging considering CAPEX and OPEX.



New and Renewable Energy Resource

Solar Panel on PCTC 'COSCO TENGFEI'

COSCO Ship with Wind Power

LNG as Fuel Oil

Methanol as Fuel

'Cold' Energy in the sea water may be used especially by Offshore Platform

Battery may be used to set up a hybrid system for crane operation or for ship propulsion.



CSSC Intelligent Ship

mail wall water to all and a strange

E-navigation
Human element
Big data technologies

Intelligent ship

The Overview of CSSC Intelligent Ship



Data Service of CSSC Intelligent Ship

Data service for life cycle

- Shore data center
- Ship performance assessment
 - Energy efficiency assessment
 - Ship diagnosis by CFD
- Engine maintenance support
 - Remote diagnosis
 - Predictive maintenance support
- Navigation support
 - Route optimization
- Custom-made service



We may get better and more efficient ship with the help of new methodology, good material and improved equipments/systems.

and and the second of the second

Let's team up and do it!



Thank You !