

Structure of ship's hull

1. Ship's hull and requirements for hull

- 1.1. Ship's hull and its main elements; terms and definitions
- 1.2. Sailing conditions and their influence on the strength of the vessel
- 1.3. The external loads acting on the hull
- 1.4. The regulation principles of ship's hull strength
- 1.5. The objectives of the science of ship hull structures strength
- 1.6. The requirements for the ship's hull as a whole and to its separate structures

2. Perception the hull structures of external loads acting on the vessel

- 2.1. Function of the shell and frame of ship's hull structure
- 2.2. Grids of girders and plating, forming the frame and grillages
- 2.3. Perception and transmission scheme to strengthen grids of different categories to the rest of grillage
- 2.4. Systems of framing of ship's hull structures

3. The overall buckling and overall longitudinal strength of the hull

- 3.1. The overall buckling of the ship's hull in the vertical longitudinal plane
- 3.2. Determination of the calculated values of the bending moments and shearing forces
- 3.3. Determination of wave bending moments calculated by probabilistic methods

4. Mechanical stresses in the ship's hull at its general buckling

- 4.1. The concept of the main hull girder (box girder)
- 4.2. The box girder analysis in the first approximation
- 4.3. Choosing of ship's hull cross sections and the elements of box girder
- 4.4. Calculation of direct stresses in the second approximation
- 4.5. Criteria of regulation of the general longitudinal strength of ship's hull
- 4.6. Comply with the rules of classification societies for box girder modulus of resistance and standard of general longitudinal strength
- 4.7. Influence of changes in the vertical distribution of material on ship's hull transverse sections modulus of resistance
- 4.8. Influence of the superstructure construction (superstructures, deck-houses, longitudinal comings, bulwarks) on the general buckling of ship's hull
- 4.9. Structural decisions being taken to the rational distribution of the material on ships with large hatches

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- 5.1. Rules for construction of ships and maritime strength standards of Classification Societies
- 5.2. Determining the sizes and thicknesses of hull structures and regulations of maritime Classification Societies
- 5.3. Choosing the size of hull structures with verification of the strength calculation (reduced grids thicknesses)
- 5.4. Rational choice of framing system for a variety of ship's hull grillages; calculation of the sizes and thicknesses of box girder grids

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- 6.1. Ship construction steel; characteristics of steel weldments
- 6.2. The possibility and expediency of using for ship construction of Standard strength carbon steel and high-strength steel
- 6.3. Range of sheet and rolled sections of steel

- 6.4. Range of sheet and rolled sections made of light alloys
- 6.5. Cutting and stretching of metal sheet
- 6.6. Corrosion and wear of ship hull structures

7. Various structural classes of commercial cargo ships and features of their structures

- 7.1. Effect of operating requirements for architectural - structural types of vessels
- 7.2. The main factors determining the structural type of the vessel
- 7.3. Freeboard and Load Line
- 7.4. Vessel Class of the maritime Classification Society Rules; vessels of the limited sailing area
- 7.5. The influence of the separate components of the marine transportation line for structural classes of vessels
- 7.6. Changing of cargo handling technology and transportation of cargoes - a defining factor in the development of structural types of cargo ships
- 7.7. Universalization and specialization of the marine commercial vessels
- 7.8. The role of shipping companies in the creation of new structural types of vessels
- 7.9. Liquid carriers
- 7.10. Bulk cargo carriers
- 7.11. Combined vessels
- 7.12. Universal dry cargo ships for general cargo
- 7.13. Vessels for containers transportation
- 7.14. Ships with a horizontal loading - unloading (Ro-Ro ships)
- 7.15. Ships for lighters transportation
- 7.16. tug/barge towing arrangements
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- 8.2. Criteria for local strength
- 8.3. Damage to structures of new vessels and the potential occurrence of cracks in them
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- 9.2. Composite welded profiles of girders
- 9.3. Choosing the size and thickness of frame girders for separate floors
- 9.4. Connection and intersection of frame girders at the components
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- 10.2. Structure of the double bottom in the bilge area
- 10.3. The choice of framing system for bottom floors

- 10.4. Structure of the bottom floors in the engine room, in the middle of the hull (of length), and in the bow
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- 13.1. Mechanical interaction between the decks fences together in the vessel's hull
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