

Determination of ship's systems characteristics

1. Rationale for design decisions when designing of general ship's systems

- 1.1. Purpose and classification of ship's systems
- 1.2. Variants of the general ship's systems and piping
- 1.3. Types of comfort air conditioning systems
- 1.4. Types of technical conditioning air systems and inert gases systems
- 1.5. Types of heating systems of the vessel
- 1.6. Variants of cooling systems and heat supply

2. Evaluating the effectiveness and technical level of general ship's systems

- 2.1. Systematic and integrated design approaches of ship's systems
- 2.2. The efficiency of ship's system
- 2.3. Assessment of quality and technical level of ship's system
- 2.4. Determining the weight of ship's system efficiency indexes
- 2.5. Calculation of the quantitative values of performance indexes of ship's system

3. Calculations of the economic feasibility indexes for choice of type and characteristics of ship's system

- 3.1. The calculation of annual discounted costs
- 3.2. The choice of characteristics of operating ship's system
- 3.3. Determination of economically reasonable pipeline diameter of ship's system
- 3.4. The test case of the pipeline diameter determining
- 3.5. The choice of parameters of the ship's heating system

4. Thermal calculations for design of general ship's systems; properties of air and water

- 4.1. Air and its physical properties
- 4.2. Meteorological parameters of outside air
- 4.3. Consideration of solar radiation
- 4.4. Microclimate of the ship's premises
- 4.5. Water and its physical properties

5. The balance of heat and moisture in the ship's premises

- 5.1. The balance of heat loss in the ship's premises at low outside temperatures
- 5.2. Heat in the ship's premises
- 5.3. Allocation of water in the ship's premises
- 5.4. The balance of heat influxes in the ship's premises

6. Thermal calculations for design of systems of steam and water heating systems of ship's premises and supply of steam for consumption

- 6.1. Calculation of the working surface of heating elements of ship's premises
- 6.2. Calculation of steam and hot water consumption flows for heating of ship's premises
- 6.3. The calculation of the of steam flow for consumption

7. Thermal calculations for design of ventilation systems of the ship's premises, air conditioning systems and inert gas systems

- 7.1. Determination of air flow demand for ventilation
- 7.2. Calculations of the characteristics for design of the air heating system
- 7.3. The calculation for design of air conditioning comfort systems
- 7.4. Heat and humidity calculations of air conditioning comfort systems
- 7.5. Calculation of the adsorption and absorption processes data

7.6. The calculation of technical air conditioning systems in ship 'cargo holds

8. Thermal calculations for design of ship's cooling systems

8.1. Project characteristics calculation of cooling systems for provision storerooms

8.2. Features of the calculation of the cooling systems of refrigerated holds

8.3. Choice of refrigeration equipment in the design of cooling systems

9. Hydraulic calculations of general ship's systems

9.1. The viscosity of liquids and gases

9.2. Calculation of the fluid, the flow rate and continuity of the flow

9.3. Hydrodynamic regimes of flows, the Reynolds number

10. The pressure losses in pipes

10.1. Frictional resistance during the flow of the liquid (gas) in a straight pipe

10.2. Pressure losses in local resistances

10.3. Outflow of fluid from the holes, nozzles and sprayers

11. The work of pumps and fans in the ship's systems

11.1. The diagram of the pressure in the piping system of the ship

11.2. Characteristics of pumps and fans

11.3. Working pumps or fans together in the ship's system

11.4. Stability of the pumps or fans working in the ship's system

11.5. Choice of pumps or fans for the ship's system

12. Pumps of ventilation, air conditioning and inert gases ship's systems

12.1. Determination of joint work fan in the duct

12.2. Analysis of systems of inert gases characteristics

12.3. Formation of the distribution of gas and air in the ship's system

12.4. The calculation of natural ventilation in the ship

12.5. Calculation of the resistance of the pipeline when the air density changes

12.6. Calculation of local exhausts in the ship

13. Hydraulic calculations of steam systems and water heating in the ship in the pipes of the cooling system and compressed air

13.1. Steam heating systems

13.2. Steam distribution stations

13.3. Water heating systems

13.4. Pipes of cooling systems

13.5. Pipes of compressed air

14. Mathematical modeling of dispersion of the water withdrawal to outer water surface

14.1. Mathematical modeling of processes

14.2. Determination of acceptable levels of indicators of outfallen water when the vessel mooring and moving

15. More subjects of design calculations of ship's systems

15.1. Determination of the number and capacity of electric heaters of ship's heating system

15.2. Accounting for the effects of pressure fluctuations in the pipelines at the temperature of water in a blender

- 15.3. Determination of capacity of cylinders of compressed air, and output of air compressors to run the diesel engine
- 15.4. Calculation of changes in humidity during air compression and expansion
- 15.5. Evaluation of hydrodynamic stability of vacuum chillers