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**РУКОВОДСТВО  
ДЛЯ ПОДГОТОВКИ К ИТОГОВОЙ  
ГОСУДАРСТВЕННОЙ АТТЕСТАЦИИ  
ПО АНГЛИЙСКОМУ ЯЗЫКУ  
ДЛЯ ЭЛЕКТРОМЕХАНИКОВ**

Учебно-методическое пособие  
для подготовки к государственному экзамену  
по английскому языку для курсантов и студентов  
специальности 26.05.07 «Эксплуатация судового  
электрооборудования и средств автоматики»  
всех форм обучения

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## ВВЕДЕНИЕ

Учебно-методическое пособие составлено в соответствии с требованиями Федерального государственного образовательного стандарта по направлению подготовки (специальности) 26.05.07 «Эксплуатация судового электрооборудования и средств автоматики», утвержденного приказом Минобрнауки России от 15 марта 2018 г. № 193 (далее – ФГОС ВО) и Международной конвенцией о подготовке и дипломировании моряков и несении вахты (далее ПДНВ-78/95) (раздел А-III/6) к профессиональной подготовке курсантов и студентов.

### Требования к результатам освоения программы специалитета по ФГОС ВО

Категория универсальных компетенций	Код и наименование компетенции	Индикаторы достижения компетенции
Коммуникация	УК-4. Способен применять современные коммуникативные технологии, в том числе на иностранном(ых) языке(ах), для академического и профессионального взаимодействия	УК-4.1. Использует современные информационно-коммуникативные средства для коммуникации УК-4.3. Демонстрирует умение вести обмен профессиональной информацией в устной и письменной формах на английском языке

### Международная конвенция ПДНВ-78/95 с манильскими поправками Таблица А-III/6

*Спецификация минимальных стандартов компетентности  
для электромехаников*

**Функция: Электрооборудование, электронная аппаратура и системы управления на уровне эксплуатации**

Колонка 1	Колонка 2	Колонка 3	Колонка 4
<b>Сфера компетентности</b>	<b>Знание, понимание и профессиональные навыки</b>	<b>Методы демонстрации компетентности</b>	<b>Критерии для оценки компетентности</b>
Использование английского языка в письменной и устной форме	Достаточное знание английского языка, позволяющее лицу командного состава использовать технические пособия и выполнять свои обязанности	Экзамен и оценка результатов практического инструктажа	Пособия на английском языке, относящиеся к обязанностям лица командного состава, правильно понимаются. Связь четкая и понятная

# I. СОДЕРЖАНИЕ И ТРЕБОВАНИЯ К ГОСУДАРСТВЕННОМУ ЭКЗАМЕНУ ПО АНГЛИЙСКОМУ ЯЗЫКУ

I. Просмотреть статью из журнала (объем 2,5 тыс. печатных знаков) и передать ее содержание на русском языке.

**Время подготовки – 30 минут.**

II. Монологическое высказывание по одной из изученных тем:

1. Профессия судового электромеханика.
2. Электрическая распределительная система судна.
3. Генераторы постоянного и переменного тока.
4. Валогенераторы.
5. Аварийный генератор.
6. Электромоторы.
7. Трансформаторы, аккумуляторные батареи, кабели.
8. Вспомогательное электрооборудование (ходовые и сигнальные огни, аварийное освещение, холодильное оборудование и система кондиционирования воздуха).
9. Дизель-электрическая силовая установка.
10. Судовые автоматизированные системы.
11. Обеспечение безопасности работы в море (СОЛАС, ПДНВ-78). Правила электробезопасности.
12. Предотвращение загрязнения окружающей среды (МАРПОЛ).

**Время подготовки – 10 минут.**

III. Работа в паре по ситуациям. Ситуативные диалоги по теме «Ремонт в иностранном порту»:

1. Ситуативный диалог «Предварительное обсуждение ремонтной ведомости».
2. Ситуативный диалог «Общая информация относительно капремонта главного двигателя и крышек цилиндров».
3. Ситуативный диалог «Ремонт парового котла».
4. Ситуативный диалог «Ремонт главного распределительного щита».
5. Ситуативный диалог «Ремонт щита питания с берега».
6. Ситуативный диалог «Ремонт электромоторов».
7. Ситуативный диалог «Ремонт электрооборудования на камбузе. Лампы».
8. Ситуативный диалог «Ремонт траловой лебедки и рулевой машины».
9. Ситуативный диалог «На борту судна».
10. Ситуативный диалог «В машинном отделении».
11. Ситуативный диалог «В бойлерной».
12. Ситуативный диалог «Опреснительная установка».
13. Ситуативный диалог «Туннель гребного вала».
14. Ситуативный диалог «В румпельном отделении».
15. Ситуативный диалог «Аварийный дизель-генератор».

**Время подготовки – 10 минут.**

## II. УСТНЫЕ ТЕМЫ ДЛЯ МОНОЛОГИЧЕСКОГО ВЫСКАЗЫВАНИЯ

### 1. ПРОФЕССИЯ СУДОВОГО ЭЛЕКТРОМЕХАНИКА DUTIES OF ELECTRICAL ENGINEER

The man in charge of a vessel is the Master. He is responsible for the vessel, her cargo, and safety of the crew. The ship's crew consists of Deck, Engine, and Catering departments.

Engine department operates, maintains, and repairs internal combustion engines, boilers, steam turbines, refrigeration and air conditioning systems, and also takes part in emergency repairs.

THE CHIEF ENGINEER is in command of the engine department and personnel. He is responsible for all ship's machinery, equipment, and control systems; for their operation, maintenance, and repair. The Chief Engineer is also responsible for administration, supervision, and economical operation of the engine department. The Electrical Engineer is responsible to the Chief Engineer for the satisfactory operation of all electrical equipment onboard.

THE ELECTRICAL ENGINEER is responsible for electrical propulsion plant, main and emergency switchboards, transformers and converters, fire pumps and other fire-fighting equipment, alarm systems, fire detection equipment and telephone systems, fans and electric heaters, deck equipment which is driven by electric motors, wiring, batteries of auxiliary and emergency generators, etc. He is also in charge of all lighting onboard including emergency, masts, and bridge lights.

The Electrical Engineer is responsible for proper electrical maintenance methods of all electrical machinery onboard such as checking for short and grounded circuit overloading, megger test for insulation resistance. If necessary, the Electrical Engineer diagnoses electrical faults and performs repairs or replacement of broken electrical equipment and systems according to the checklist procedures.

He needs to cooperate with the Radio Officer in the maintenance of navigation electronic equipment on the bridge.

The Electrical Engineer is responsible for all technical documents and spare parts concerning all electrical equipment onboard.

If necessary, the Electrical Engineer assists the engineer officers with mechanical maintenance. He follows all requirements of pollution prevention and safety onboard and does all other duties assigned by the Chief Engineer.

Exercise 1. Answer the questions to check comprehension

1. What departments does the ship's crew consist of?
2. Who is the Electrical Engineer directly responsible to?
3. What is the Electrical Engineer responsible for?
4. Who does he cooperate with in the maintenance of navigation electronic equipment on the bridge?
5. Is the Electrical Engineer responsible for the correspondence of the engine department?

Exercise 2. Translate the following applied terminology

Internal combustion engine, electrical propulsion plant, emergency switchboard, transformer, converters, fire-fighting equipment, alarm systems, fans, electric heater, wiring, auxiliary generators, batteries, lighting, short circuit, grounded circuit overloading, insulation resistance, electrical fault, checklist procedures, spare parts, requirements of pollution prevention.

Exercise 3. Finish the sentences

1. The man in charge of a vessel is ...
2. The Electrical Engineer is responsible to the Chief Engineer for ...
3. The Electrical Engineer is responsible for ...
4. The Electrical Engineer performs repairs or replacement of broken electrical equipment according to ...
5. The Electrical Engineer assists the engineer officers with ...

Exercise 4. Translate sentences into English

1. Капитан несет ответственность за судно, груз и безопасность экипажа.
2. Старший механик несет ответственность за работу, обслуживание и ремонт судовых механизмов.
3. Электромеханик несет ответственность за электрическую силовую установку, главный и аварийный распределительные щиты, трансформаторы, систему сигнализации и пожаротушения, электромоторы, генераторы, аккумуляторные батареи, кабели и провода, освещение и другое электрооборудование.
4. Электромеханик проводит диагностику электрооборудования, проверяет наличие короткого замыкания в цепи, измеряет сопротивление изоляции, выполняет ремонт и замену неисправного оборудования согласно инструкции.

Exercise 5. Make a plan and retell the text «**Duties of electrical engineer**».

## **2. ЭЛЕКТРИЧЕСКАЯ РАСПРЕДЕЛИТЕЛЬНАЯ СИСТЕМА СУДНА POWER DISTRIBUTION SYSTEM**

The function of a ship's electrical distribution system is to convey electrical power to every item of equipment connected to it.

The most obvious element in the system is the main switchboard. The main board supplies bulk power to motor starter groups, section boards and distribution boards. Transformers interconnect the HV and LV distribution sections of the system. Circuit breakers and fuses automatically disconnect a faulty circuit within the network.

The main switchboard is placed in the engine control room and from there engine room staff monitor and control the generation and distribution of electrical power. It is very important that every engineer has a profound knowledge of the electrical distribution of the ship's power. The only way to acquire this knowledge is to study the ship's power diagrams.

Almost all oceangoing ships have an AC distribution system in preference to a DC system. Usually a ship's electrical distribution scheme follows shore practice. This allows normal industrial equipment to be used after being adapted and certified where it's necessary, so it can withstand the conditions on board of a ship (e.g. vibration, freezing and tropical temperatures, humidity, the salty atmosphere, etc. encountered in various parts of the ship).

Most ships have a 3-phase AC, 3-wire, 440V insulated-neutral system. This means that the neutral point of star connected-generators is not earthed to the ship's hull. Ships with very large electrical loads have generators operating at high voltages of 3.3KV, 6.6KV, and even 11KV. By using these high voltages we can reduce the size of cables and equipment. High voltage systems are becoming more common as ship size and complexity increase.

The frequency of an AC power system can be 50 Hz or 60Hz. The most common power frequency adopted for use on board ships is 60Hz. This higher frequency means that generators and motors run at higher speeds with a consequent reduction in size for a given power rating.

Lighting and low power single-phase supplies usually operate at 220 V. This voltage is derived from a step down transformer connected to the 440 V system.



Exercise 1. Answer the questions to check comprehension

1. What is the function of a ship's electrical distribution system?
2. What is the function of the main switchboard?
3. What is the function of transformers, circuit breakers and fuses?
4. Where is the main switchboard placed?
5. What kind of distribution system do most ships have?
6. Why does a ship's electrical distribution scheme follow shore practice?
7. Why do ships have high voltage system?
8. What is the most common power frequency on board?
9. What voltage does lighting operate at on board?

Exercise 2. Translate the following applied terminology

Electrical distribution system, to convey, main switchboard, to supply, motor starter group, circuit breaker, fuse, faulty circuit, engine control room, ship's power diagram, to follow shore practice, to withstand, humidity, insulated-neutral system, to earth, to reduce, high voltage, frequency, power rating, lighting, to derive, step-down transformer.

Exercise 3. Finish the sentences

1. The function of ship's electrical distribution system is ...
2. The most obvious element in the system is ...
3. Most ships have ...
4. The frequency of an AC power system can be ...
5. Lighting and low power single phase supplies usually operate at ...

Exercise 4. Translate sentences into English

1. Главный распределительный щит подает энергию к группе стартеров электродвигателей и распределительным щитам.
2. Трансформаторы соединяют высоковольтные и низковольтные распределительные системы.
3. Предохранители автоматически отключают неисправную цепь от сети.
4. Судовое электрооборудование должно выдерживать определенные условия на борту судна: вибрацию, низкие и высокие температуры, влажность и т. п.
5. Большие суда оснащены генераторами, работающими на высоком напряжении, что позволяет уменьшить размеры оборудования и кабелей.

Exercise 5. Make a plan and retell the text «**Power Distribution System**».

### 3. ГЕНЕРАТОРЫ ПОСТОЯННОГО И ПЕРЕМЕННОГО ТОКА DC AND AC GENERATORS

In order to supply electric power and lighting, the ship is equipped with generators. Generators may be driven by a diesel engine, by a steam or gas turbine, or by the main propulsion engine as a shaft generator. Most generators are driven by diesel engines and produce rotating alternating current (AC).

A generator converts mechanical energy into electrical energy by using the principle of magnetic induction and electromagnetic force. This conversion is based on Faraday's law: an induction voltage is generated in a conductor when it encounters change of flux, i.e. when it is moving in a magnetic field or when it is in a moving magnetic field. The total induced electromotive force (EMF) in a generator is proportional to the flux and the speed of rotation.

A generator has two main parts: an armature and a field structure. The armature has coils of wire in which the electricity is induced. The field structure generates the magnetic lines of force. The armature or the field structure can be the rotating part of a generator. The rotating part is called the rotor and the stationary part is the stator. The frame is made of steel in the form of a closed magnetic conductor. The main poles produce the main magnetic flux. The commutating poles are fitted between the main poles. The commutating poles with the windings are designed for non-sparking operation of an electric machine. The armature is cylindrical core made of sheet steel laminations and a two-layer winding fixed in their slots. A generator can produce either alternating current or direct current. A converter is used to convert AC to DC or from DC to AC.

According to the type of field connection, there are 3 general types of DC generators: series, shunt (parallel), and compound. And there are 3 types of AC generators: single-phase, two-phase and three-phase (with delta or wye connections). The vast majority of the ships nowadays use 3-phase AC generators. An AC generator has 3 sets of coils, called phase windings, located in slots in the stator surrounding the rotating the rotating magnetic poles. One end of the three phase windings are joined together to form the neutral point of a star connection. The other ends of phase windings are connected to outgoing conductors called lines. The speed of an auxiliary diesel generator is managed by an electronic fuel governor which maintains an almost constant output frequency over its load range.

DC generators are hardly ever found on board ships due to a number of disadvantages. A disadvantage of direct current systems is that the voltage from the generator, which is basically alternating voltage, is transformed into direct voltage by using commutators (collectors) and carbon brushes. These require extensive maintenance and become more complicated when the capacity is increased. Consequently, if DC is required it is obtained with an AC generator in combination with a rectifier.

Exercise 1. Answer the questions to check comprehension

1. What may generators be driven by?
2. What electric power is usually generated on board vessels?
3. What is a generator?
4. What does induced electromotive force depend on?
5. What are the basic parts of a generator?
6. What types of DC and AC generators do you know?
7. What is the function of a converter?
8. What is the most common type of generators used on board?
9. What is the disadvantage of direct current system?
10. Is it possible to obtain direct current on board without DC generator?

Exercise 2. Translate the following applied terminology

Steam turbine, main propulsion engine, shaft generator, to convert, magnetic induction, conductor, flux, electromotive force, armature, field structure, coil, wire, to induce, rotor, stator, main poles, commutating poles, winding, non-sparking operation, cylindrical core, lamination, slot, converter, series DC generator, shunt DC generator, compound DC generator, three-phase AC generator, delta connection, wye connection, voltage, commutator, carbon brushes, to require, capacity, to obtain, rectifier.

Exercise 3. Finish the sentences

1. Most generators are driven by ...
2. A generator converts mechanical energy into electrical energy by using the principal of ...
3. A generator has two main parts: ...
4. The majority of the ships nowadays use ...
5. The disadvantage of direct current system is ...

Exercise 4. Translate sentences into English

1. Морские суда оснащены генераторами для снабжения электроэнергией различного оборудования.
2. Индуцированная электродвижущая сила в генераторе пропорциональна потоку и скорости вращения.
3. Якорь имеет катушки, в которых вырабатывается электричество, а индукторная станина генерирует силовые линии магнитного поля.
4. Добавочные полюса с обмоткой спроектированы для уменьшения искрения при работе генератора.
5. Скорость вспомогательного генератора регулируется электронным регулятором подачи топлива, который обеспечивает постоянную выходную частоту.

Exercise 5. Make a plan and retell the text « **DC and AC Generators** ».

#### **4. ВАЛОГЕНЕРАТОРЫ**

#### **SHAFT GENERATORS**

To eliminate the usage of independently driven generators when the ship is underway, shaft generator concept is used. A shaft generator is a particularly efficient way to produce electric power onboard, especially when combined with the use of a controllable pitch propeller.

Shaft generators are mainly suitable for those ships that are equipped with large low-speed engines. In this case the device is mounted on the propeller-driving intermediate shaft to drive the ship's generator via a stepped-up gearing. Also, medium-speed four-stroke main engines with shaft generators and CPP installations have been favoured in the last decades.

The shaft generator extracts electric power from the ship's main engine. Consequently, the power is derived from lower cost fuel than that used for an auxiliary diesel generator. By using a shaft generator as the main source of electric power during long sea passages, the diesel generator operates for short periods only. Consequently, maintenance requirements for diesel generators are reduced.

The main two parts of a shaft generator are the stator and the rotor. The rotor is a rotating electro-magnet which produces a magnetic field. It rotates within the stator. A stator is a tube of coiled copper wire. The rotor, a permanent magnet, rotates inside this tube. The desired voltage is developed in the stator around this magnet.

The excitation methods can be either rotary or static. A rotary method utilizes an AC or DC exciter which is mounted on the shaft and rotates with the rotor of the main generator. In past, rotary exciters were DC generators with stationary field poles, rotating armature, commutator (collector) and brushes. Now the most common arrangement is to use a shaft mounted AC exciter.

The shaft generator can be arranged in different ways. The configuration for medium-speed main engine is the drive of the shaft generator by power take off (PTO) of the reduction gear. In case of low-speed main engine, the poles of the shaft generator are mounted directly on the shaft.

Advantages of shaft generators are as follows:

- It is possible to use less costly heavy fuel oil for power generation.
- It reduces the operating time, maintenance and inspection cost for the auxiliary diesel generators.

The disadvantage of a shaft generator is that it has no direct frequency control so it must be separately regulated at the output to maintain a constant 60 Hz to the ship's electric power consumers.

### Exercise 1. Answer the questions to check comprehension

1. When is it possible to use shaft generator concept to produce electric power?
2. What ships are usually equipped with shaft generators?
3. How does the shaft generator extract electric power?
4. What parts of a shaft generator do you know?
5. What excitation methods can be used?
6. Describe the configuration of the shaft generator for medium-speed main engines.
7. Where is the shaft generator mounted in case of low-speed main engine?
8. What are advantages of shaft generators?
9. What is the main disadvantage of a shaft generator?

### Exercise 2. Translate the following applied terminology

Shaft generator concept, underway, controllable pitch propeller, mount, propeller-driving intermediate shaft, stepped-up gearing, medium-speed four-stroke engine, extract, derive, auxiliary diesel generator, main source, maintenance requirements, tube of coiled copper wire, permanent magnet, excitation method, utilize, armature, power take off, reduction gear, heavy fuel oil, reduce, operating time, frequency control, constant, electric power consumers.

### Exercise 3. Finish the sentences

1. Shaft generators are used as a main source of electric power during ...
2. The main two parts of a shaft generator are ...
3. The excitation methods can be ...
4. In past, rotary exciters were DC generators with ...
5. The disadvantage of a shaft generator is ...

### Exercise 4. Translate sentences into English

1. Валогенераторы используются для производства электроэнергии на борту судна во время плавания.
2. Валогенератор извлекает электроэнергию, используя судовой главный двигатель.
3. Вращающийся в пределах статора электромагнит, производящий магнитное поле, называется ротор.
4. В большинстве случаев используется возбуждатель переменного тока, установленный на валу.
5. Преимуществом валогенератора является возможность использования более дешевого тяжелого топлива для производства электроэнергии и снижения расходов на обслуживание вспомогательного дизель-генератора.

### Exercise 5. Make a plan and retell the text «**Shaft Generators**».

## **5. АВАРИЙНЫЙ ГЕНЕРАТОР EMERGENCY GENERATOR**

In case of the failure of the main power generation system on the ship an emergency supply of electricity is required for essential services. The emergency power supply ensures that the essential machinery and system continues to operate the ship. This can be supplied by batteries, but most merchant ships have an emergency generator.

The emergency generator must be rated to provide power to the essential systems of the ship such as driving electric motors of the bilge pump, emergency fire pump, steering gear, starting air compressor, watertight doors and possibly fire-fighting equipment. Emergency lighting for occupied areas, navigation lights, communications systems and alarm systems must also be supplied. Where electrical control devices are used in the operation of main machinery, these too may require a supply from the emergency generator.

A switchboard, called emergency switchboard (ESWBD), in the emergency generator room supplies these various loads. It is not usual for an emergency generator to require paralleling, so no equipment is provided for this purpose. Automatic start up of the emergency generator at a decreased voltage signal from the mains (MSWBD) is required.

Emergency generator is normally located outside the machinery space of the ship, at the remote distance from the engine room and usually above the bulkhead deck, that is at the weather (poop) deck level or above. This is done mainly to avoid those emergency situations when access to the engine room is not possible. An emergency switchboard in the emergency generator room supplies power to different essential machinery.

The emergency generator is a diesel-driven generator of sufficient capacity to provide essential circuits such as steering, navigation lights and communications. The diesel engine has its own supply system, usually of light diesel oil for easy starting. Batteries, compressed air or a hydraulic accumulator may be used for starting the machine (two independent starting systems are required). Small machines may be air cooled but larger units are arranged usually for water cooling with an air cooled radiator as heat exchanger in the system. A small switchboard (ESWBD) is located in the same compartment to connect the supply to the various emergency services.

Modern systems are arranged to start the emergency generator automatically when the main power supply fails. The system should be checked regularly and operated to ensure availability if required. Fuel tanks should be kept full, ample cooling water should be in the radiator cooling system, and the starting equipment should be functional. Batteries of course, should be fully charged or air receivers full.

Exercise 1. Answer the questions to check comprehension

1. What is the function of an emergency generator?
2. What essential systems of the ship require a supply from the emergency generator?
3. What is the use of emergency switchboard?
4. What device provides the automatic start up of the emergency generator?
5. Where is the emergency generator located? Why?
6. What does the emergency generator (a diesel-driven generator) provide?
7. Does the diesel engine have its own supply system?
8. What devices may be used for starting the machine?
9. Why are both an emergency generator and batteries recommended?
10. What equipment should be checked regularly?

Exercise 2. Translate the following applied terminology

Failure, emergency power supply, essential services, bilge pump, steering gear, starting air compressor, watertight door, navigation lights, switchboard, load, voltage signal, bulkhead deck, poop, avoid, access, sufficient capacity, circuit, supply system, independent starting system, heat exchanger, compartment, ample cooling water, radiator cooling system, fully charged, air receiver.

Exercise 3. Finish the sentences

1. An emergency supply of electricity is required in case of ...
2. An emergency switchboard supplies ...
3. Emergency generator is located ...
4. Small machines may be ... but larger units are arranged for ...
5. Fuel tanks should be ... and the starting equipment should be ...

Exercise 4. Translate sentences into English

1. Современные системы запускают аварийный генератор автоматически, когда основной источник электропитания выходит из строя.
2. Питание должно подаваться на электромоторы трюмного и пожарного насосов, рулевой механизм, компрессор пускового воздуха, аварийное освещение, системы связи и пожарной сигнализации.
3. Аварийный генератор обычно расположен вне машинного отделения, чтобы избежать аварийной ситуации, при которой доступ в машинное отделение невозможен.
4. Все системы должны проверяться регулярно, чтобы обеспечить надлежащую работу аварийного генератора.
5. Аварийный распределительный щит расположен в том же отсеке.

Exercise 5. Make a plan and retell the text «**Emergency Generators**».

## 6. ЭЛЕКТРОМОТОРЫ ELECTRIC MOTORS

Electric motors are used to actuate compressors, pumps, winches, fans, etc aboard ship. The electric motor converts electrical energy into mechanical motion. The operation of an electric motor is based on the principle of electromagnetism. It rotates as a result of two magnetic fields interacting with each other.

DC electric motors are powered by a direct current power supply and are not frequently used. There are 3 types of DC motors: series, shunt and compound. They require commutator brushes that limit power output and a lot of maintenance.

The most frequently used type of electric motor is the motor powered by an alternating current supply - AC motor. AC motors are not limited in the power they can produce. There are two main types of AC electric motors: asynchronous induction motors, which are widely used onboard ships and synchronous induction motors, which are rarely used onboard ships.

The advantage of asynchronous induction motor is the lack of vulnerable carbon brushes that require frequent maintenance. The disadvantages of asynchronous induction motor are the large amount of initial current that it requires and the low starting torque it produces. The synchronous AC motor is less popular because it is expensive and the carbon brushes require frequent maintenance; the advantages of the synchronous motor are the small amount of initial current it requires and its high starting torque.

The most common type of electric motor is the three-phase AC cage-rotor induction motor. It is popular because it is simple, rigid and requires very little attention. Three phase induction motors are usually supplied at 440 (380) V, 60 (50) Hz, though 3.3 kV and 6.6 kV, 60 Hz are sometimes used for very large drives such as bow thrusters, cargo pumps, compressors and gas compressors.

Electric motors and generators are similar in construction. The main components of an electric motor are the stator and the rotor. The stator has three separate insulated phase windings which are spaced 120 degrees apart and lying in slots cut into a laminated steel magnetic core. The ends of the stator windings are terminated in the stator terminal box where they are connected to the incoming cable from the three-phase AC power supply.

The rotor consists of copper or aluminium conductor bars which are connected together at their ends by short-circuiting rods to form a cage winding. Such a rotor is called a squirrel cage rotor. The conductor bars are set in a laminated steel magnetic core. The induction motor having this type of simple, robust rotor which usually has no insulation on the conductor bars and doesn't have slip-rings, commutator and brushes, is the simplest electric motor and basically maintenance free.



Exercise 1. Answer the questions to check comprehension

1. What is the function of an electric motor?
2. What types of DC motors do you know?
3. What are disadvantages of DC motors?
4. What types of AC motors are used on board?
5. What are advantages and disadvantages of asynchronous induction AC motors?
6. Why is synchronous AC motor less popular?
7. What is the most common type of electric motor? Why?
8. What are the main components of an electric motor?
9. What type of rotor is called a squirrel-cage rotor?

Exercise 2. Translate the following applied terminology

Winches, actuate, convert, frequently used, limit, asynchronous induction motor, synchronous motor, vulnerable carbon brushes, frequent maintenance, initial current, starting torque, three-phase AC cage-rotor induction motor, rigid, direct-on-line contactor starter, bow thrusters, cargo pumps, insulated phase winding, slot, laminated steel magnetic core, terminal box, copper conductor, short-circuiting rod, squirrel cage rotor, conductor bar, robust rotor, slip-rings.

Exercise 3. Finish the sentences

1. The electric motor converts ...
2. There are two types of AC electric motors: ...
3. The most common type of electric motor is ...
4. The main components of electric motor are ...
5. The rotor consists of ...

Exercise 4. Translate sentences into English

1. Электромоторы используются для запуска компрессоров, насосов, лебедок на борту судна.
2. Преимуществом асинхронного индукционного электромотора является отсутствие углеродных щеток, которые требуют частого обслуживания.
3. Статор имеет изолированные фазовые обмотки, расположенные в пазах ламинированного стального магнитного сердечника.
4. У индукционного электромотора нет токособирательных колец, коммутатора и щеток.
5. Электромоторы постоянного тока не часто используются на борту судна.

Exercise 5. Make a plan and retell the text «**Electric motors**».

## **7. ТРАНСФОРМАТОРЫ И АККУМУЛЯТОРНЫЕ БАТАРЕИ**

### **TRANSFORMERS AND BATTERIES**

Electric generation on board ship is typically at three-phase AC, 440 V, 60 Hz, while fixed lighting and other low power loads are supplied with 220 V AC single-phase from very efficient static transformer units. Ships with HV generation require three-phase transformers to supply the LV engine room and accommodation sub-switchboards, e.g. using 6600/440 V units.

The transformers are generally air cooled and mounted in sheet steel enclosures that are often located adjacent to the main switchboard. Three-phase 440/220 V lighting transformers are usually composed of 3 separate single-phase units interconnected to form a three-phase arrangement. Two transformers from the main switchboard, as well as two transformers from the emergency switchboard, are usually provided to supply the ship's 220 V consumers in such a way that one transformer is strong enough to bear full load while allowing the other unit to remain in standby. In the event of failure, it will be isolated from the circuit by circuit breakers and the load will be taken by the standby unit.

At regular specific intervals, transformers must be switched off, covers removed and all accumulated dust and deposits removed by a vacuum cleaner and suitable brushes. Windings must be inspected for any sign of damage or overheating. Cable connection must be checked for tightness.

A battery is the key elements in the provision of essential and emergency power supplies on board ships. Essential routine power supplies (radio equipment, telephone exchange, fire detection) are often supplied from a set of batteries worked on a regular charge/discharge cycle. Emergency battery supplies (for emergency generator startup and emergency lighting) are used in a standby role to give power when the main supply fails. Ships batteries are usually rated at a nominal voltage of 24 V DC.

There are two main types of rechargeable battery cell: lead-acid and alkaline. The nominal cell voltage of each type are 2 V for lead-acid and 1.2 V for alkaline. The battery capacity is usually rated in terms of its discharge at the 10 hour rate. The battery room should be well ventilated, clean and dry. Both types generate hydrogen gas during charging, so smoking and naked flames must be prohibited in the vicinity of the batteries. Acid cells must never be placed near alkaline cells because of the risk of rapid electrolytic corrosion. Battery maintenance includes keeping the cell tops clean, dry, checking the tightness of terminal nuts and applying petroleum jelly to connections to prevent corrosion.

Exercise 1. Answer the questions to check comprehension

1. What is the function of transformers on board?
2. What types of transformers do HV generation ships require?
3. Where are transformers located?
4. What types of AC motors are used on board?
5. Why is it necessary to have a pair of transformers on board ?
6. What does transformer maintenance include?
7. What is the function of batteries on board?
8. What types of batteries do you know?
9. What is the battery capacity rate?
10. Why is it prohibited to place acid cells near alkaline cells?
11. What does battery maintenance include?

Exercise 2. Translate the following applied terminology

Electric generation, low power load, three-phase transformer, mount, sheet steel enclosure, adjacent, main switchboard, consumer, bear full load, circuit breaker, standby, failure, accumulated dust, deposits, brushes, windings, overheating, tightness, fire detection, charge/discharge cycle, generator startup, nominal voltage, lead-acid battery, alkaline battery, battery capacity, hydrogen gas, naked flame, in the vicinity, electrolytic corrosion, terminals, petroleum jelly.

Exercise 3. Finish the sentences

1. Fixed lighting and other low power loads are supplied with ...
2. Transformers are usually located ...
3. In the event of failure, transformers ...
4. Emergency battery supplies are used in standby role to ...
5. There are two main types of battery cell: ...

Exercise 4. Translate sentences into English

1. Суда с высоковольтной системой требуют установки трехфазных трансформаторов для подачи питания в машинное отделение с низковольтной системой.
2. Один из пары трансформаторов должен выдерживать полную нагрузку пока другой трансформатор находится в режиме ожидания.
3. Обмотки должны быть проверены на повреждения, а соединения кабелей должны плотно прилегать друг к другу.
4. Верхняя часть аккумуляторных батарей должна быть сухой, клеммы плотно прижаты, соединения смазаны для предотвращения коррозии.
5. Трехфазный трансформатор обычно состоит из отдельных однофазных устройств, соединенных между собой.

Exercise 5. Make a plan and retell the text «**Transformers and batteries**».

**8. ВСПОМОГАТЕЛЬНОЕ ЭЛЕКТРООБОРУДОВАНИЕ (ХОДОВЫЕ И СИГНАЛЬНЫЕ ОГНИ, АВАРИЙНОЕ ОСВЕЩЕНИЕ, ХОЛОДИЛЬНОЕ ОБОРУДОВАНИЕ И СИСТЕМА КОНДИЦИОНИРОВАНИЯ ВОЗДУХА)  
AUXILIARY ELECTRICAL SERVICES (NAVIGATION AND SIGNAL LIGHTS, EMERGENCY LIGHTING, REFRIGERATION AND AIR CONDITIONING)**

**NAVIGATION AND SIGNAL LIGHTS**

The number, position and visible range of navigation lights on board ships is prescribed by the International Maritime Organization (IMO). The most common arrangement is to have five specially-designed navigation running lights: foremast, mainmast, port, starboard and stern. Two anchor lights may also be switched from the navigational light panel on the bridge. The side lights are red for port and green for starboard, while the other lights are white. Due to safety requirement it is common practice to have two fittings in each position. Each light is separately supplied, switched, fused and monitored from a navigation light panel in the wheelhouse. The electric power is usually 220 V AC fed from the essential service section of the main switchboard. An alternative power is fed from the emergency switchboard. The navigation light panel has indicator LEDs and an audible alarm to warn in case of failure. The NUC (Not Under Command) state is signaled using two all-round red lights vertically mounted. These important lights are fed from the 24 V DC emergency supply.

**EMERGENCY LIGHTING**

SOLAS Convention prescribes requirements for emergency lighting throughout the vessel. Most emergency lighting is powered from the ship's emergency switchboard at 220 V AC. Emergency lights at staircases and through the escape route may be supplied from the ship's 24 V DC battery supply. If the main power supply fails the emergency lighting system must switch on automatically.

**REFRIGERATION**

Whatever the size of the ship's refrigerators, each will have an evaporator (cooling unit), a refrigerant compressor and a condenser. Additional components may include filter driers, heat exchangers, accumulators and pre-coolers. Also protective controls such as thermostats, relays, defrost controls and overcurrent trips are required. Some refrigerators and freezers may have electric heaters to prevent sweating on the panel. Additionally there may be condenser and evaporator fans driven by single-phase type motors.

**AIR CONDITIONING**

Air conditioning is a process that heats, cools, cleans and circulates air and controls the moisture content. The electrical aspects of air conditioning comprises the power equipment of motors and starters for compressors, fans and seawater cooling pumps driven by fixed-speed three-phase AC induction motors. Control equipment includes electric solenoid valves, high and low pressure and temperature switches together with safety cutouts for overcurrent. Routine electrical maintenance and fault finding will involve cleaning, checking connections, testing for correct operation.

Exercise 1. Answer the questions to check comprehension

1. What navigation running lights do you know?
2. What colors are used for navigation lights?
3. Where is a navigation light panel located?
4. What lights are used to signal the NUC?
5. What power supply is required for emergency lighting?
6. What components do ship's refrigerators have?
7. What is the function of air conditioning?
8. What does the electrical aspect of air conditioning comprise?
9. What does routine electrical maintenance include?

Exercise 2. Translate the following applied terminology

Navigation and signal lights, arrangement, foremast, mainmast, port, starboard, stern, anchor lights, navigational light panel, safety requirement, fuse, wheelhouse, emergency switchboard, LED, audible alarm, NUC, emergency lighting, requirement, staircase, escape route, evaporator, refrigerant compressor, condenser, heat exchanger, thermostat, relay, defrost control, overcurrent, sweating, circulate, moisture, comprise, seawater cooling pump, induction motor, electric solenoid valve, fault finding.

Exercise 3. Finish the sentences

1. The number and position of navigation lights is prescribed by ...
2. Each light is separately supplied, ...
3. SOLAS Convention prescribes ...
4. Some refrigerators and freezers may have ...
5. Air conditioning is a process that ...

Exercise 4. Translate sentences into English

1. Огни левого борта – красные, правого борта – зеленые, остальные огни – белые.
2. В целях безопасности огни обычно дублируются.
3. Питание аварийного освещения лестниц и маршрута эвакуации подается от судовой аккумуляторной батареи с напряжением 24 вольта постоянного тока.
4. Любая холодильная установка состоит из испарителя, компрессора и конденсатора.
5. Контрольное оборудование включает в себя электрические электромагнитные клапана, переключатели высокого и низкого давления и предохранители в случае перегрузки.

Exercise 5. Make a plan and retell the text «**Auxiliary electrical services**».

## **9. ДИЗЕЛЬ-ЭЛЕКТРИЧЕСКАЯ СИЛОВАЯ УСТАНОВКА**

### **DIESEL ELECTRIC PROPULSION PLANT**

Electric propulsion system offers numerous advantages for ships that are subject to specific requirements. They are rated as particularly economical, environmentally friendly and reliable, offer considerable comfort in terms of operation and control, have optimal maneuvering and positioning properties, low vibration and noise levels.

The electrical side of all systems is based on a direct current or an alternating current motor, coupled to the ship's propeller shaft, with the speed and direction of propeller rotation being governed by electric control of the motor itself or by the alternation of the power supply.

The electric propulsion arrangement for a ship is characterized only by the type of prime mover with no reference to the type of electric propulsion motor. When the prime mover is a diesel engine, then it is called diesel-electric propulsion. A Diesel Engine is a propulsion plant in which the heat that is generated by internal combustion of a mixture of a fuel and air is converted into power. Modern engines may be classified by the working cycle into two-stroke cycle and four stroke cycle engines. Following actions take place inside the engine. First of all the air must be put into the cylinder. Then the air must be compressed to a high pressure. After this the fuel is injected. It ignites owing to the contact with compressed hot air. Burning takes place. Gaseous mixture expands and pushes on the piston. Piston goes down and transmits force to the crankshaft. The last action is exhausting. The burnt gases are pushed out of the cylinder.

The diesel electric propulsion system is not a new concept, it has a long history. Passenger vessels have always been the largest ships using electric propulsion. Such vessels as tugs, dredgers, trawlers, lighthouse tenders, cable ships, ice breakers, research ships, floating cranes, and vessels for the offshore industries have also been and are built with electric propulsion. The propulsion system of a vessel provides thrust to move the vessel. Conventional propellers, controllable pitch propellers, azipods, transverse tunnel thrusters, and low speed water jet systems can be driven with equal effectiveness by a diesel-electric system.

The two types of diesel electric propulsion system dominating the market today are frequency controlled AC Motors and SCR (Silicon Controlled Rectifiers) controlled DC Motors. Power for DC propulsion motor is supplied from DC generator. Power for AC propulsion motor is supplied by an alternator; the prime movers are diesel engines. Both technologies have a proven record of efficiency and reliability.

Exercise 1. Answer the questions to check comprehension

1. What are advantages of electric propulsion system?
2. What is the electrical side of all systems based on?
3. What type of prime mover does diesel electric propulsion plant have?
4. What is a diesel engine?
5. What types of diesel engines do you know?
6. What actions take place inside the engine?
7. What ships are usually built with electric propulsion system?
8. What gears can be driven by diesel-electric system?
9. What types of diesel electric propulsion system dominate the market today?

Exercise 2. Translate the following applied terminology

Electric propulsion system, maneuvering and positioning properties, noise level, propeller shaft, prime mover, diesel-electric propulsion, heat, internal combustion, two-stroke cycle, four-stroke engine, cylinder, inject, ignite, expand piston, crankshaft, exhausting, tug, dredger, floating crane, controllable pitch propeller, azipod, transverse tunnel thruster, frequency, silicon controlled rectifier.

Exercise 3. Finish the sentences

1. Ships with electric propulsion system are ...
2. The electric propulsion arrangement for a ship is characterized by ...
3. A diesel engine is ...
4. There are two types of diesel electric propulsion system ...
5. The prime movers in diesel electric propulsion plants are ...

Exercise 4. Translate sentences into English

1. Система базируется на моторах постоянного или переменного тока в паре с гребными валами, а первичным двигателем является дизельный двигатель.
2. Современные дизельные двигатели можно классифицировать по выполнению рабочего цикла на двухтактные и четырехтактные двигатели.
3. Воздух сжимается до высокого давления, топливо впрыскивается и воспламеняется от контакта с горячим воздухом.
4. Газообразная смесь расширяется и толкает поршень вниз, заставляя коленвал вращаться.
5. Технологии электромоторов переменного тока с частотным регулированием и электромоторы постоянного тока с кремниевыми выпрямителями доказали свою надежность и эффективность.

Exercise 5. Make a plan and retell the text «**Diesel electric propulsion plant**».

## **10. СУДОВЫЕ АВТОМАТИЗИРОВАННЫЕ СИСТЕМЫ**

### **MARINE AUTOMATION SYSTEMS**

Nowadays an increasing number of engines are operated and monitored from the engine control room or the bridge through the remote control system. This system is used to set the direction of rotation, to start the engine, to control speed, to stop the engine, etc. Modern automation and control systems are fully integrated systems covering many aspects of the ship operation such as the propulsion plant operation, power management operation on the auxiliary engines, the auxiliary machinery operation, etc.

Recent developments in modern marine technology have made certain engine parts of conventional engines redundant. In modern electronically controlled engines, the conventional hydro pneumatic control of air-starting valves is replaced by an electro-hydraulic, mechatronic engine control system that activates solenoid valves which in turn actuate the air-starting valves with precise control. Each cylinder unit has its own Hydraulic Cylinder Unit (HCU) that additionally controls the air starting system, fuel injection, cylinder lubrication and exhaust valve operation.

In new electronically controlled ME-C engines the number of mechanical parts of the conventional MC-C engines have been replaced by hydraulic and mechatronic parts. These parts include chain drive, camshaft with cams, fuel injection pumps, mechanical exhaust valves, starting air distributor, mechanical governor, mechanical cylinder lubricator, etc. They have been replaced by the following: Hydraulic Power Supply Units (HPSU); Hydraulic Cylinder Units (HCU); Electronically controlled Alpha Lubricator; Crankshaft position sensing system; Engine Control System (ECS) that controls.

Developments in automatic control and monitoring systems as well as high reliability of equipment have resulted in centralizing of control and supervisory functions. Modern ships employ a high degree of automation and the control room within the machinery spaces carries centralized instrumentation which enables remote operation and monitoring of all control functions. Display panels have mimic diagrams with alarm lights, valve position indicators, pump running lights and indicators of all operating parameters. Data recording systems are also provided.

The automatic control system includes a combination of electrical, electronic, hydraulic and pneumatic systems and devices interlinked with sensors, transmitters and regulators all monitored by computer systems. The result of this level of automation is unmanned operation of machinery spaces. If a ship is classified for UMS operation, the electrical survey is extended and includes all the alarms, fire-detection, controls and fail-safe features of installations.



Exercise 1. Answer the questions to check comprehension

1. How can engines be operated and controlled nowadays?
2. What aspects of the ship operation do automation systems cover?
3. What was replaced by an electro-hydraulic, mechatronic engine control system?
4. What does Hydraulic Cylinder Unit control?
5. What engine parts have been replaced by in new ME-C engines?
6. What does a high degree of automation and the control room with the machinery spaces provide?
7. What are placed on display panels?
8. What does the automatic control system include?
9. What are requirements for successful UMS operation?

Exercise 2. Translate the following applied terminology

Engine control room, remote control system, fully integrated system, propulsion plant operation, auxiliary machinery, conventional, redundant, solenoid valves, air-starting valves, actuate, precise control, Hydraulic Cylinder Unit, fuel injection, cylinder lubrication, exhaust valve, hydraulic and mechatronic parts, chain drive, camshaft, governor, Hydraulic Power Supply Unit, Crankshaft positioning sensing system, supervisory functions, mimic diagrams, alarm light, data recording system, transmitter, unmanned operation, fail-safe features.

Exercise 3. Finish the sentences

1. Remote control system is used to ...
2. Developments in marine technology have made certain engine parts ...
3. Each cylinder unit has ... that controls ...
4. Automatic control and high reliability of equipment have resulted in ...
5. If a ship is classified for UMS operation ...

Exercise 4. Translate sentences into English

1. Двигатели контролируются с поста управления в машинном отделении или с мостика посредством системы дистанционного управления.
2. Система регистрации данных обрабатывает большое количество информации об измеряемых параметрах.
3. Система автоматического контроля включает электрические, электронные, гидравлические, пневматические системы и устройства, соединенные с датчиками, которые контролируются компьютерной системой.
4. Современные суда имеют высокий уровень автоматизации.

Exercise 5. Make a plan and retell the text «**Marine Automation systems**».

**11. ОБЕСПЕЧЕНИЕ БЕЗОПАСНОСТИ РАБОТЫ В МОРЕ (СОЛАС, ПДНВ-78).  
ПРАВИЛА ЭЛЕКТРОБЕЗОПАСНОСТИ  
SAFETY AT SEA (SOLAS, STCW-78). ELECTRICAL SAFETY**

International investigation of marine accidents has shown that 80% of all marine accidents are caused by human error. Safety grows with knowledge and understanding the regulations and training of the crew. This is the aim of the International Convention on Standards of Training Certification and Watch-keeping for Seafarers, 1978 (STCW-78).

The main objective of the SOLAS Convention (adopted in 1974) is to specify minimum standards for construction, equipment and operation of ships related to their safety. SOLAS requires fire protection system, survival crafts, personal life-saving appliances, Global Marine Distress and Safety System radio equipment and safety management system. The ship lifesaving system consists of floatation aids: lifejackets, lifebuoys, immersion suit, thermal protective aid and survival crafts, lifeboats, and life rafts. SOLAS also contains electrical regulations in Chapter II, Part D “Electrical installations”. Regulations describe requirements for main and emergency source of electrical power and lighting, generators, precautions against shock, fire and other hazards of electrical origin.

There are three general types of hazards at sea: physical, health and environmental. Fire prevention should be part of every ship operation. It's necessary to understand how fires start and spread, to know how to prevent them. There is so-called fire triangle. Combustion happens when 3 elements - fuel, heat and oxygen – are brought together. You can prevent fire by removing one of them.

Electrical equipment must be maintained in good condition as it can be a source of fire. Almost 16 % of shipboard fires are caused by electrical faults. Electricity kills. Before commencing work on any electrical machinery it's necessary to ensure that electrical machinery is isolated. Do it yourself, don't rely on anyone else. A “permit to work” is required to carry out work on electrical equipment above 1000V. In case of electrical shock, don't touch the victim, isolate the electrical supply and seek medical attention.

Fires are classified according to the types of materials acting as fuel. This classification is also used for extinguishers. There are 2 types of equipment to control the fires. Small portable extinguishers are used for small fires and fixed installations with a greater danger. There are 4 main types of extinguishers foam (chemical), soda-acid, dry powder and carbon dioxide. Fixed installations common for ships are: fire main which can supply water to any point aboard the ship, sprinkler system, foam system and carbon dioxide, inert gas or halon system. Everybody on the ship should remember that it's better to prevent a fire than to extinguish it.

Exercise 1. Answer the questions to check comprehension

1. What is the cause of most marine accidents?
2. What is the aim of STCW-78?
3. What is the main objective of SOLAS convention?
4. What does SOLAS convention require?
5. What information do electrical regulations contain?
6. What types of hazards at sea do you know?
7. What does “fire triangle” mean?
8. Describe electrical safety rules.
9. What types of fire-extinguishers do you know?

Exercise 2. Translate the following applied terminology

Investigation, regulations, STCW, SOLAS, survival craft, safety management system, floatation aids, immersion suit, liferaft, source of electrical power, precautions, hazard, prevention, spread, fire triangle, combustion, heat, oxygen, electrical fault, commence work, electrical shock, victim, isolate, extinguisher, portable, foam, soda-acid, dry powder, carbon dioxide, fixed installation, sprinkler system, halon system.

Exercise 3. Finish the sentences

1. 80 % of all marine accidents are caused by ...
2. Safety grows with the knowledge and ...
3. SOLAS contains electrical regulations in ... that describe ...
4. Combustion happens when ...
5. In case of electrical shock ...

Exercise 4. Translate sentences into English

1. ПДНВ-78 описывает базовые требования о подготовке, дипломировании и несении вахты для моряков на международном уровне.
2. Главной целью конвенции СОЛАС является установка минимальных стандартов для конструкции судна, оборудования и работы судов в отношении их безопасности и охраны человеческой жизни.
3. Перед выполнением любых работ с электрическим оборудованием необходимо убедиться, что оно отключено, все кабели изолированы.
4. Каждый должен помнить, что лучше соблюдать правила безопасности и предотвратить возгорание, чем тушить пожар.
5. Неисправное электрооборудование может стать причиной пожара.

Exercise 5. Make a plan and retell the text «**Safety at sea (SOLAS, STCW-78). Electrical safety**».

## **12. ПРЕДОТВРАЩЕНИЕ ЗАГРЯЗНЕНИЯ ОКРУЖАЮЩЕЙ СРЕДЫ (МАРПОЛ) MARINE POLLUTION PREVENTION. MARPOL**

The vessel traffic in the World Ocean is constantly growing. As a result the risk of marine pollution is greatly increasing. That's why in 1973 the International Conference adopted the Convention for Prevention of Pollution from ships by oil, chemicals, harmful substances in packaged form, sewage and garbage. It was modified in 1978 introducing stricter regulations for the inspection and certification of ships.

Sometimes pollution can be caused by tanker accidents. Pollution can also come from engine room bilges of all ships, as bilge water is always contaminated by oil. According to the Convention the ships should be equipped with technical facilities that prevent the possibility of discharging waters containing oil or oily products into the sea. If a ship notices an oil slick the captain should immediately inform the authorities about it. The inspectors make up a violation report. It's important for the ship to prove her innocence because of high penalties. The crew must show that the bilge water passes through a separator and that's registered in the Oil Record Book.

The ships are fitted with separating equipment capable of limiting oil content in the discharged waters to 15 particles per million. There is a special control system with alarm and automatic stopping device for discharging. The ships are provided with tanks for bilge water and there is a pipeline for discharge of residues to sludge facilities ashore. For environment protection every ship must also be equipped with a sewage treatment plant. It operates continuously during the ship's stay in a port or in areas close to discharge of sewage. The ship must have a system to comminute and disinfect the sewage that is to be collected in the sewage tank. It is allowed to discharge overboard waters from sewage system at full speed when the ship is more than 300 miles off the coast.

MARPOL Convention deals with all forms of marine pollution. The crewmembers should be informed of the Regulation according to which the disposal of all kinds of plastic into the sea is prohibited. Food waste should be stored in special receptacles. You can put the garbage in incinerators on board your ship. In the port dry rubbish and garbage should be taken away by ash-boats. There is also a regulation which limits the production of smoke and emission by combustion equipment and fuel. There are certain limits on the quantity and types of chemicals if the vessel is in a special area. It's also forbidden to discharge any garbage in "prohibited zones". They are mostly inland seas such as the Baltic Sea, the Mediterranean Sea and others.

An initial survey before the ship is put in service or before an International Oil Pollution Prevention Certificate is issued. Unscheduled inspection and mandatory annual surveys must be carried out.

Exercise 1. Answer the questions to check comprehension

1. What was the reason of introducing MARPOL Convention?
2. What forms of marine pollution does the Convention deal with?
3. What can oil pollution be caused by?
4. What should the captain do if a ship notices an oil slick?
5. What technical facilities should every ship be equipped with?
6. When does a sewage treatment plant usually operate?
7. Is it possible to discharge plastic into the sea?
8. Where should food waste stored?
9. What is the function of an incinerator on board?
10. What does “prohibited zone” mean according to the Convention?

Exercise 2. Translate the following applied terminology

Pollution prevention, harmful substances, sewage, garbage, bilge water, contaminate, discharge, oil slick, authorities, violation report, innocence, penalty, separator, Oil Record Book, particle, pipeline, residues, sludge, sewage treatment plant, comminute, disinfect, regulations, disposal, prohibited, receptacle, incinerator, dry rubbish, ash-boat, smoke and emission, combustion equipment, prohibited zones, inland sea, initial survey, mandatory annual survey.

Exercise 3. Finish the sentences

1. In 1973 the International Conference adopted the Convention for ...
2. The ships should be equipped with ...
3. It's important for the ship to prove her innocence because of ...
4. Separating equipment can limit oil content in discharges waters to ...
5. The disposal of all kind of plastic ...

Exercise 4. Translate sentences into English

1. Конвенция МАРПОЛ состоит из 6 Приложений, которые описывают правила по предотвращению загрязнения моря с судов.
2. Старший механик должен показать журнал нефтяных операций с записями об очистке и прохождении льяльных вод через сепаратор.
3. Судно оборудовано системой по измельчению и дезинфекции сточных вод.
4. Существуют ограничения на производство и выброс вредных веществ, образующихся в результате работы оборудования по сжиганию топлива.
5. Суда проходят обязательную ежегодную проверку, после которой выдается сертификат.

Exercise 5. Make a plan and retell the text «**Marine Pollution Prevention. MARPOL**».

### III. СИТУАТИВНЫЕ ДИАЛОГИ ПО ТЕМЕ «РЕМОНТ В ИНОСТРАННОМ ПОРТУ»

#### 1. СИТУАТИВНЫЙ ДИАЛОГ «ПРЕДВАРИТЕЛЬНОЕ ОБСУЖДЕНИЕ РЕМОНТНОЙ ВЕДОМОСТИ»

##### DIALOGUE 1. DISCUSSION OF THE REPAIR LIST

**Mr. Brown:** Good morning! I'm an inspector of the commercial department of the ship repairing company. My name is Brown.

**Chief Engineer:** Good morning! I'm Chief Engineer Petrov.

**Mr. Brown:** Glad to meet you. I hope that our business relations will be fruitful and pleasant for the both parties.

**Chief Engineer:** I hope too.

**Mr. Brown:** Let's get down to business. We've got some preliminary information about the future repairs, but I'd like to verify the scope of the work.

**Chief Engineer:** Well, the amount of the repairs has somewhat changed. And also we'd like to put the ship in the dock and to have the aft bulwark replaced. We've made out an additional list of repairs.

**Mr. Brown:** Very good, Captain. I think we can do all this extra work. Floating dock №2 will be available in 5 or 7 days. By the way, I'd like to know if your outboard fittings need repairing too.

**Chief Engineer:** Yes, it's necessary to repair all the outboard fitting and to replace the controllable pitch propeller (CPP) blade.

**Mr. Brown:** Doesn't the list of repairs include the CPP repair?

**Chief Engineer:** No, it doesn't. The CCP was damaged when we were fishing in the Labrador area. There is too much floating ice there, you know.

**Mr. Brown:** I see. And what about the bulwark? Much work to do?

**Chief Engineer:** We damaged it while mooring in the open sea. I don't think the repair will be too complicated, but you'll have to do a lot of welding.

**Mr. Brown:** But I must see the damage myself.

**Chief Engineer:** Certainly. I'll take you there. But first let's finish with the list of repairs.

**Mr. Brown:** I suppose you'll go through the list of repairs with the representatives of our ship repair department. They'll come tomorrow morning and you'll have an opportunity to discuss everything in detail. They'll also revalue the cost of your repairs.

**Chief Engineer:** All right, then.

additional – дополнительный

amount – объем

be available – быть в наличии

besides – кроме

bulwark – фальшборт

controllable pitch propeller (CPP) –  
винт регулируемого шага (ВРШ)

floating dock – плавучий док

outboard fillings – забортная  
арматура

party – сторона (в договоре)

preliminary – предварительный

replace – заменять

## EXERCISES

### 1. Translate the word combinations from Russian into English

Ремонтная ведомость; уточнять объем работы; заменить фальшборт; лопасть ВРШ; плавучий док; забортная арматура; быть в наличии; сделать переоценку стоимости; тщательно разбирать (пункт за пунктом); швартоваться; сложный ремонт; сварка; список запчастей; повреждать.

### 2. Answer the questions

1. Why did Mr. Brown decide to verify the scope of the work?
2. When will Floating dock №2 be available?
3. Was it necessary to repair all the outboard fittings and to replace controllable pitch propeller blade (CPP)?
4. Does the list of repair include the CPP repair?
5. Where was the CPP damaged?
6. How was the bulwark damaged?
7. Who will revalue the cost of repairs with the Chief Engineer?

### 3. Fill the gaps

1. I'm an inspector of the commercial department of the ... .. company.
2. I hope that our ... .. will be fruitful and pleasant for the both parties.
3. He would like to ... the scope of the work.
4. The CPP was damaged when we were ... in the Labrador area.
5. Also we would like to put the ship in ... and to have the aft ... replaced.
6. The repair of bulwark won't be too complicated, but you'll have to do a lot ... .
7. I suppose you'll ... the list of repairs with the representatives of our ... .

### 4. Translate from Russian into English

A: So what else has to be done?

B: Необходимо заменить лопасть ВРШ.

A: Isn't it included in the list of repairs?

B: Нет. Поломка произошла в районе Лабрадора, где много плавающего льда.

A: And what about the bulwark? Much work to do?

B: Фальшборт мы повредили при швартовке в открытом море. Ремонт несложный, но предстоят большие сварочные работы.

A: I must see the damage myself.

B: Хорошо. Сюда, пожалуйста.

A: I'd like to see the list of spare parts to be ordered.

B: Вот перечень запчастей, которые имеются у нас на борту, а здесь список запчастей, которые нам необходимо заказать.

A: Why is there so much zink here in the list?

B: Это цинковые протекторы пойдут на замену старых по всему корпусу судна.

A: May I have the list of spares to be ordered?

B: Конечно.

## 2. СИТУАТИВНЫЙ ДИАЛОГ «ОБЩАЯ ИНФОРМАЦИЯ ОТНОСИТЕЛЬНО КАПРЕМОНТА ГЛАВНОГО ДВИГАТЕЛЯ И КРЫШЕК ЦИЛИНДРОВ»

### DIALOGUE 2. GENERAL INFORMATION CONCERNING THE MAIN ENGINE OVERHAUL AND THE CYLINDER HEADS

**Mr. Wilson:** Good morning! I'm the manager of the ship repair department. My name is Wilson.

**Chief Engineer:** Good morning, Mr. Wilson. I'm the Chief engineer. My name is Petrov.

**Mr. Wilson:** Well, let's discuss the list of repairs concerning the main engine and its supply systems.

**Chief Engineer:** Our main engine was in operation for some ten years and has already run 46,000 hours. Now it requires general overhaul.

**Mr. Wilson:** In this case we'll have to do a lot of additional work to dismantle and mount the main engine again. It is included in the list of repairs, isn't it?

**Chief Engineer:** Yes, it is. You may see it here: items Nos 5-32.

**Mr. Wilson:** Is everything listed in these items?

**Chief Engineer:** Practically everything, I guess. As to taking off telephones, sensors and indicators at the control panel, I'm sure our men can do it.

**Mr. Wilson:** Very well, then. What about the cylinder heads? Do the contact surfaces of the cylinder heads require machining or just scraping?

**Chief Engineer:** They need both.

**Mr. Wilson:** Are all the cylinder head fitting going to be renewed or can some of them be repaired?

**Chief Engineer:** Well, the starting valves are to be overhauled with later pressure testing. But all the other fittings (the safety valves, the indicating cocks, etc.) should be renewed.

**Mr. Wilson:** Very well. According to the list of repairs you'd like to have only four exhaust valves replaced. Why not all of them?

**Chief Engineer:** The other exhaust valves are O.K. But their disks and stems should be turned.

**Mr. Wilson:** Do you think that the exhaust valve rockers and rods should be replaced too?

**Chief Engineer:** No, I don't think so. But the rocker bronze bushes and pins should be renewed.

**Mr. Wilson:** Well, I see.

cock – кран

concerning – относительно

cylinder head – крышка цилиндра

dismantle – демонтировать, разбирать

exhaust valve – выхлопной клапан

general overhaul – капитальный  
ремонт

item – пункт

list – перечислять

mount – устанавливать

require – требовать

safety valve – предохранительный  
клапан

scraping – шабровка

surface – поверхность



## EXERCISES

### 1. Translate the word combinations from Russian into English

Требовать; демонтировать, разбирать; капитальный ремонт; пульт управления; снимать; устанавливать, собирать; пункт; крышка цилиндра; шабровка; предохранительный клапан; поверхность; выхлопной клапан; шток клапана; втулка; тарелка клапана; коромысло.

### 2. Answer the questions

1. What did Mr. Wilson and the Chief Engineer discuss?
2. Does the main engine require general overhaul?
3. What additional work is necessary to overhaul the main engine?
4. Is the additional work included in the list of repairs?
5. Do the contact surfaces of the cylinder heads require machining or just scraping?
6. Are all cylinder head fittings going to be renewed?
7. How many exhaust valves should be replaced?

### 3. Fill the gaps

1. Our main engine was ... for some ten years. (and has already run 46000 hours).
2. The main engine requires general ... .
3. We'll have to do a lot of additional work to ... and ... the main engine again.
4. Is everything ... in these items?
5. All the cylinder head fittings should be ... .
6. The starting valves are to be ... .
7. The exhaust valves, disks and stems should be ... .

### 4. Translate from Russian into English

A: Let's discuss the list of repairs concerning the engine and its supply systems.

B: Наш двигатель был в работе десять лет и требует капитального ремонта.

A: In this case we'll have to do a lot of additional work to dismantle and mount the main engine again. Is it included in the list of repairs?

B: Да, вы можете увидеть это здесь: пункты № 5–32.

A: Is everything listed in these items?

B: Да. Что касается снятия датчиков пульта управления, мы сделаем это.

A: Very well, then. What about the cylinder heads? Do the contact surfaces of the cylinder heads require machining or just scraping?

B: Им необходимо и то и другое.

A: Are all the cylinder head fitting going to be renewed or repaired?

B: Пусковой клапан должен быть отремонтирован с последующей опрессовкой. Но все другие части должны быть заменены.

A: You'd like to have only four exhaust valves replaced. Why not all of them?

B: Остальные выхлопные клапана в порядке.

A: Do you think that the exhaust valve rockers and rods should be replaced too?

B: Нет, но коромысло бронзовых втулок и пальцев должны быть заменены.

A: Well, I see.

### 3. СИТУАТИВНЫЙ ДИАЛОГ «РЕМОНТ ПАРОВОГО КОТЛА»

#### DIALOGUE 3. STEAM BOILER

**Chief Engineer:** Now then, gentlemen, let's go on with our work and discuss the repairs to our steam boiler.

**Mr. Wilson:** O.K. What repairs, namely, does it require?

**Chief Engineer:** Cleaning on the water and fire sides and repairing all the accessories and automatic devices - that's what our boiler needs. Besides, we are also planning to have three failed water tubes replaced.

**Mr. Wilson:** What's the trouble?

**Chief Engineer:** You see, they are distorted in way of the upper tube plate.

**Mr. Wilson:** Oh, that! As a rule, the most usual cause of tube failure is shortage of water. That's why I'd like to know if there was any water leakage from the boiler.

**Chief Engineer:** No, there wasn't. But the tubes happened to be exposed in their upper part.

**Mr. Wilson:** What's the diameter of the tubes?

**Chief Engineer:** 36 mm.

**Mr. Wilson:** I'm sorry to say but we have no heat-resistant tubes of such a diameter.

**Chief Engineer:** Really? It's a pity. We didn't expect that. Why you've had the list of repairs for quite a time! I suppose you might have ordered the tubes or at any rate let us know about that beforehand.

**Mr. Wilson:** Don't worry, we'll settle this matter somehow or other. Maybe we shall order the tubes in Denmark or elsewhere.

**Chief Engineer:** We appreciate your assistance and hope that everything will be all right.

boiler accessories – арматура котла

device – устройство, прибор

water tube – водогрейная трубка

distort – деформировать

failure – повреждение

shortage – нехватка

heat-resistant – жаростойкий

expose – оголяться, выходить  
из воды

leakage – утечка

## EXERCISES

### 1. Translate the word combinations from Russian into English

Водогрейная трубка; утечка; деформировать; устройство, прибор; повреждение; арматура котла; нехватка; жаростойкий; водная и огневая сторона; трубная доска; выходить (выступать) из воды; во всяком случае.

### 2. Answer the questions

1. How many water tubes does the Chief Engineer plan to replace?
2. Where are water tubes distorted?
3. What is the most usual cause of tube failure?
4. Was there any water leakage from the boiler?
5. Where were the water tubes exposed?
6. Are the heat-resistant tubes of 36 mm diameter available?
7. Where can Mr. Wilson order the water tubes?

### 3. Fill the gaps

1. Water tubes are ... in way of the upper tube plate.
2. The most usual cause of tube failure is ... of water.
3. The tubes happened to be ... in their upper part.
4. We have no ... tubes of such a diameter.
5. I suppose you have ordered the tubes or let us know about that ... .
6. We shall order the tubes in Denmark or ... .
7. We ... your assistance and hope that everything will be all right.

### 4. Translate from Russian into English

A. Now gentlemen, let's go on with our work and discuss the repairs of our steam boiler.

В. Какой ремонт именно необходим?

A. Cleaning on the water and fire sides and repairing all the accessories and automatic devices - that's what our boiler needs. Besides, we are also planning to have three failed water tubes replaced.

В. Где повреждены водогрейные трубки?

A. They are distorted in way of the upper tube plate.

В. Наиболее частая причина повреждения водогрейной трубки – это утечка воды. Поэтому я бы хотел знать, была ли какая-либо утечка воды из бойлера?

A. No, there wasn't. But the tubes happened to be exposed in their upper part.

В. Какой диаметр трубок?

A. 36 mm.

В. К сожалению, у нас нет жаростойких трубок такого диаметра.

A. It's a pity. We didn't expect that. I suppose you might have ordered the tubes.

В. Не беспокойтесь, мы решим данный вопрос так или иначе. Может быть, мы закажем трубки в Дании или в другом месте.

A. We appreciate your assistance and hope that everything will be all right.

#### 4. СИТУАТИВНЫЙ ДИАЛОГ «РЕМОНТ ГЛАВНОГО РАСПРЕДЕЛИТЕЛЬНОГО ЩИТА»

##### DIALOGUE 4. THE MAIN SWITCHBOARD

**Electrical engineer:** Now, gentlemen, let's pass on to the electrical equipment.

**Mr. Wilson:** First of all we'd like to measure the insulation level of all your generators under working conditions and the total insulation level of your ship's electrical equipment. Can we do it tomorrow?

**Electrical engineer:** Why not? All our engines and the main switchboard are in operation.

**Mr. Wilson:** Mr. Petrov, tell me, please, what repairs are planned about the main switchboard?

**Electrical engineer:** We've planned the preventive maintenance of the main switchboard. It includes checking the contacts and fasteners and cleaning the circuit-breakers, relays and contactors. Only the instrumentation and several automatic devices are to be replaced.

**Mr. Wilson:** In this case I don't think it's wise to fix the exact time of putting the main switchboard out of service now. Everything depends on the work progress, doesn't it?

**Electrical engineer:** It does.

insulation level – уровень изоляции

main switchboard – главный

распределительный

щит

preventive maintenance – профилактический ремонт (обслуживание)

fasteners (fastening) – крепеж

(крепежные  
детали)

circuit-breaker – автомат

(автоматический  
выключатель)

## EXERCISES

### 1. Translate the word combinations from Russian into English

Профилактический ремонт (обслуживание), крепёжные детали, главный распределительный щит, автоматический выключатель, уровень изоляции, реле, измерять, автоматическое устройство.

### 2. Answer the questions

1. What would Mr. Wilson like to measure?
2. Are all the engines and the main switchboard in operation?
3. What repairs are planned about the main switchboard?
4. What does the preventive maintenance of the main switchboard include?
5. What instrumentation is to be replaced?
6. Is Mr. Wilson going to fix the exact time if putting the main switchboard out of service?

### 3. Fill the gaps

1. We would like to ... the insulation level of all your generators and ship's electrical equipment.
2. All your engines and the main switchboard are ... .
3. We've planned the ... of the main switchboard.
4. It includes... the contacts and fasteners and ... the circuit-breakers.
5. We should fix the exact time of putting the ... out of service.

### 4. Translate from Russian into English

A: Now, gentlemen, let's pass on the electrical equipment. Our electrical engineer, Mr. Andreyev is ready to answer your questions.

B: В первую очередь мы бы хотели измерить уровень изоляции всех генераторов в рабочем режиме и уровень изоляции всего электрооборудования вашего корабля.

A: OK. All our engines and the main switchboard are in operation.

B: Мистер Андреев, скажите мне, пожалуйста, какой ремонт требуется ГРЩ.

A: We've planned the preventive maintenance of the main switchboard. It includes checking the contacts and fasteners and cleaning the circuit-breakers, relays and contactors.

B: В этом случае я не думаю, что необходимо определить точное время отключения ГРЩ, не так ли?

A: It does.

## 5. СИТУАТИВНЫЙ ДИАЛОГ «РЕМОНТ ЩИТА ПИТАНИЯ С БЕРЕГА»

### DIALOGUE 5. THE SHORE POWER SUPPLY

**Mr. Wilson:** Mr. Petrov, it's important for us to know what machinery will operate in the engine-room during the repair works.

**Electrical Engineer:** The bilge and fire pumps will be in a continuous use. As to the ballast and boiler service pumps they will operate only occasionally.

**Mr. Wilson:** And how are you going to feed them?

**Electrical Engineer:** Well, the ship will be connected to the shore electrical supply.

**Mr. Wilson:** Is your shore-supply board in a good condition?

**Electrical Engineer:** Yes, it's O.K. But we have some trouble with the feeder cable.

**Mr. Wilson:** What's the problem?

**Electrical Engineer:** The cable is rather short, about 10 metres long only, and some difficulties may arise as the ship is lying rather far from the shore power supply.

**Mr. Wilson:** All right. We'll provide you with the cable of necessary length.

**Electrical Engineer:** Thank you. You are very helpful.

shore power supply – питание  
с берега

bilge pump – осушительный  
(трюмный) насос

fire pump – пожарный насос

ballast pump – балластный насос

occasionally – время от времени

feed – питать, подавать энергию

connect – соединять

shore-supply board – щит питания  
с берега

feeder cable – питательный кабель

provide – обеспечивать

## EXERCISES

### 1. Translate the word combinations from Russian into English

Машинное отделение; обеспечивать; питание с берега; питающий кабель (энергокабель); соединять; время от времени; пожарный насос; щит питания с берега; балластный насос; подавать энергию; осушительный (трюмный) насос; (быть) в хорошем состоянии; проблема; необходимая длина кабеля.

### 2. Answer the questions

1. What machinery will operate in the engine-room during the repair works?
2. How long will the bilge and fire pumps be used?
3. Will the ballast and boiler service pumps operate constantly?
4. How is the electrical engineer going to feed the bilge, fire and ballast pumps?
5. Is the shore-supply board in a good condition?
6. What's the trouble with the shore-supply board?
7. What's the problem with the feeder cable?
8. What cable will Mr. Petrov be provided with?

### 3. Fill the gaps

1. The bilge and fire pumps will be in a ... use.
2. The ... and ... pumps will operate occasionally.
3. The ship will ... to the shore electrical supply.
4. We have some trouble with the ... .
5. Some difficulties may arise as the ship ... rather far from the shore power supply.
6. We'll provide you with the cable of ... .

### 4. Translate from Russian into English

A. Mr. Petrov, it's important for us to know what machinery will operate in the engine-room during the repair works.

B. Осушительный и пожарный насосы будут работать постоянно. А балластный насос и насос обслуживания котла будут работать только время от времени.

A. And how are you going to feed them?

B. Судно будет соединено береговой сетью электропитания.

A. Is your shore-supply board in a good condition?

B. Щит в хорошем состоянии. Нас больше беспокоит кабель.

A. What's the problem?

B. Кабель достаточно короткий, около 10 метров только, и могут возникнуть некоторые трудности, так как судно находится довольно далеко от электростанции с берега.

A. All right. We'll provide you with the cable of necessary length.

B. Спасибо.

## 6. СИТУАТИВНЫЙ ДИАЛОГ «РЕМОНТ ЭЛЕКТРОМОТОРОВ»

### DIALOGUE 6. THE ELECTRIC MOTORS

**Mr. Wilson:** Now, why do you want us to replace the motors of the CPP (controllable pitch propeller) pumps?

**Electrical engineer:** You see, those motors operated under extremely damp conditions. Besides, one of them has been rewound. That's why we'd like to have them replaced.

**Mr. Wilson:** The thing is that those motors are of Swedish make and are not available now. We can offer you some other types but I'm not sure whether they will go with your pumps.

**Electrical engineer:** Oh, it's quite surprise for us. Well, we'll think it over again and let you know our final decision later on.

**Mr. Wilson:** We are always at your service. And now many meters of the armoured cable are to be renewed?

**Electrical engineer:** Just a moment. Some 350 meters, I guess. Let me see. Yes, 353 meters, to be exact.

damp – влажный

rewind (rewound) – перематывать

make – производство, изготовление

offer – предлагать

at your service – к вашим услугам

armoured cable – бронированный кабель



## EXERCISES

### 1. Translate the word combinations from Russian into English

Насосы винта регулируемого шага; перематывать; работать в условиях крайне высокой влажности; предлагать к вашим услугам; производство; аналогичное решение; изготовление, должны быть.

### 2. Answer the questions

1. In what conditions did these motors operate?
2. Why is it necessary to replace the motors at the CPP pumps?
3. Was one of the motors rewound?
4. Are the motors of Swedish make available now?
5. What cable is to be renewed?

### 3. Fill the gaps

1. It's necessary to replace the motors of ... .
2. Those motors operated under extremely ... .
3. One of the motors has been ... .
4. The motors of Swedish make are not ... now.
5. We can .... you some other types of these motors.
6. We think it over and let you know our ... later on.
7. How many meters of the ... are to be renewed?

### 4. Translate from Russian into English

A: Why do you want us to replace the motors of the CPP pumps?

B: Понимаете, эти моторы работали в крайне влажных условиях, поэтому мы хотим заменить их.

A: These motors are of Swedish make and are not available now. We can offer you some other types, but I'm not sure whether they will go with your pumps.

B: Хорошо, мы обсудим этот вопрос и дадим вам знать о нашем окончательном решении.

A: We are always at your service. And how many meters of the armoured cable are to be renewed?

B: Около 350 метров, я полагаю. Да, 353, если быть точным.

**7. СИТУАТИВНЫЙ ДИАЛОГ «РЕМОНТ ЭЛЕКТРООБОРУДОВАНИЯ  
НА КАМБУЗЕ. ЛАМПЫ»**

**DIALOGUE 7. THE GALLEY ELECTRICAL EQUIPMENT IN. THE LAMPS**

**Mr. Wilson:** Tell me, please, what electrical equipment is to be replaced in the galley?

**Electrical Engineer:** We think that all the electric stoves and also the motors of the potato peeler and the dough mixer should be replaced. Several electric heating elements in the baking oven require renewal, too.

**Mr. Wilson:** All right. We'll do it. I understand that you are not planning the replacement of the deck lamps and the distribution boxes. Why so?

**Electrical Engineer:** I'm afraid you are not quite right. Some deck lamps are planned to be renewed. I hope we'll repair the rest of them ourselves.

**Mr. Wilson:** All right. Mr. Andreyev, you've asked us to replace 120 cabin lamps. What lamps do you need?

**Electrical Engineer:** We'd like to have frosted dome lamps with two bulbs each. I suppose that after fitting the lamps the cabins will need some painting, won't they? I'd like to know if it is included in the lamp replacement cost.

**Mr. Wilson:** No, it isn't. Anything else concerning the electrical equipment, gentlemen?

**Electrical Engineer:** No, that's all, I guess.

gallery – камбуз

electric stove – электроплита

potato peeler – картофелечистка

dough mixer – тестомесительная  
машина

baking oven – хлебопекарная печь

deck lamp – палубный светильник

distribution box – распределительная  
коробка

the rest – остальные

froster – матовый

dome lamp – плафон

bulb – электрическая лампа,  
лампочка

painting – окраска

## EXERCISES

### 1. Translate the word combinations from Russian into English

Матовый плафон; картофелечистка; тестомесительная машина; палубный светильник; распределительная коробка; электроплита; электрическая лампа; камбуз; хлебопекарная печь; нагревательные элементы.

### 2. Answer the questions

1. What electrical equipment is to be replaced in the galley?
2. Should electric stoves or dough mixer be replaced?
3. What requires renewal in the baking oven?
4. Does electrical engineer plan the replacement of the deck lamps and the distribution boxes?
5. How many lamps did Mr. Andreyev ask to replace?
6. What lamps does he need?
7. Is painting included in the lamp replacement cost?
8. Did Mr. Andreyev discuss anything else concerning the electrical equipment?

### 3. Fill the gaps

1. All the electric ... and motors of the potato ... should be replaced.
2. Several electric heating elements in the baking ... require renewal.
3. We are planning the replacement of the deck lamps and the ... boxes.
4. We'd like to have ... lamps.
5. I'd like to know if ... is included in the lamp ... cost.
6. Would you like to discuss anything else ... the electrical equipment?

### 4. Translate from Russian into English

A: Tell me, please, what electrical equipment is to be replaced in the galley?

B: Мы думаем, что все электроплиты и моторы картофелечистки и тестомесительной машины должны быть заменены. Несколько нагревательных элементов в хлебопекарной печи требуют замены.

A: All right. We'll do it. And you are not planning the replacement of the deck lamps and the distribution boxes. Why so?

B: Только некоторые палубные светильники запланировано было заменить. Я надеюсь, остальные мы отремонтируем сами.

A: All right. Mr. Andreyev, you've asked us to replace 120 cabin lamps. What lamps do you need?

B: Нам бы хотелось получить матовые плафоны с двумя лампочками для каждого. Я думаю, что после установки ламп, каютам потребуется окраска, не так ли? Я бы хотел знать включено ли это в стоимость замены ламп?

A: No, it isn't. Anything else concerning the electrical equipment, gentlemen?

B: Нет, это всё, я полагаю.

## 8. СИТУАТИВНЫЙ ДИАЛОГ «РЕМОНТ ТРАЛОВОЙ ЛЕБЕДКИ И РУЛЕВОЙ МАШИНЫ»

### DIALOGUE 8. THE TRAWL WINCH. THE STEERING ENGINE

**Mr. Wilson:** Now, let's find out what should be done about your trawl winch.

**Chief Engineer:** Oh, yes, of course. We've planned the full replacement of the warp drum sliding bearings and the main shaft roller bearings.

**Mr. Wilson:** All right. Why are you not planning the repair of the hydraulic pumps and motors for your trawl winch?

**Chief Engineer:** Well, we don't need it. We've got a complete set of hydraulic pumps and motors for both the trawl winch and the cargo winches.

**Mr. Wilson:** Now I see. Are they made by Norwich?

**Chief Engineer:** Yes, they are.

**Mr. Wilson:** I know this company. They are experts of world-wide reputation, indeed. After the complete assembling of the hydraulic lines we are going to give them a hydraulic test under a pressure of 1.5 times the nominal pressure.

**Chief Engineer:** All right.

trawl winch – траловая лебедка  
roller bearing – роликовый подшипник  
warp (trawl) drum – ваерный барабан  
complete set – комплект

sliding bearing – подшипник  
скольжения  
hydraulic test – опрессовка,  
гидравлическое  
испытание

**Mr. Wilson:** Mr. Petrov, can we have a look at the steering engine right now and see what's going to be done on the spot?

**Chief Engineer:** Why not? Follow me, please. It won't take much time.

**Mr. Wilson:** Well, now we can discuss the particulars. We have both axial-plunger and radial-plunger pumps. Which would you rather have?

**Chief Engineer:** Those pumps which suit our steering engine by their characteristics. In our case these are axial-plunger pumps.

**Mr. Wilson:** Very well. You'll have them. The next item deals with the renewal of your rudder head packing glands. You see, to repack the glands we must put your ship in the dock. Docking is not included in your list of repairs, is it?

**Chief Engineer:** Sorry, but we have already settled this question with Mr. Brown, a representative of the commercial department. Floating dock No. 2 will be available in 2 days. We've included docking in our additional list of repairs.

**Mr. Wilson:** Mr. Petrov, the steering engine control system will be repaired by Electrolux Marine. And what repairs are required for the rudder head and blade?

**Chief Engineer:** The rudder head requires arc deposition and grinding afterwards. As to the rudder blade, it needs cleaning and electric welding.

**Mr. Wilson:** Got it. And do you want us to replace the rudder motor?

**Chief Engineer:** Certainly, it has a very high wear rate.

Rudder blade – перо руля  
Plunger – плунжер  
Arc deposition – наплавка  
электрической  
дугой  
Grinding – шлифовка

Rudder head – баллер руля  
Electric welding – электросварка  
Packing gland – сальниковое уплотнение

## EXERCISES

### 1. Translate the word combinations from Russian into English

Гидравлическое испытание (опрессовка); подшипник скольжения; траловая лебедка; роликовый подшипник; комплект; сальниковое уплотнение; баллер руля; электросварка; ваерный барабан; рулевая машина; наплавка электрической дугой; степень износа; перо руля; шлифовка; плунжер; вал; подробность (деталь).

### 2. Answer the questions

1. What repair should be done to the trawl winch?
2. Does the chief engineer plan the repair of the hydraulic pumps and motors for the trawl winch? Why?
3. What repair does the steering engine require?
4. What is the next item in the list of repair?
5. What pumps suit the steering engine by their characteristics?
6. What repair is required for the rudder head and blade?

### 3. Fill the gaps

1. We planned the full replacement of the warp dump ... and ... .
2. We have got a complete set of hydraulic pumps and motors for ... .
3. After the complete assembling of the hydraulic lines we are going to ... .
4. We have both ... and radial-plunger pumps.
5. The next item deals with the renewal of your rudder head ... .
6. The rudder head requires ... and grinding.
7. Rudder blade needs cleaning and ... .

### 4. Translate from Russian into English

A: What exactly should be done to your trawl winch?

B: Мы запланировали полную замену ваерного барабана, подшипника скольжения и основного вала роликовых подшипников.

A: All right. Why are you not planning the repair if the hydraulic pumps and motors for your trawl winch?

B: Ремонт не нужен, так как у нас есть комплект гидравлических насосов и моторов для траловой и грузовой лебедки.

A: I see. Are they made by Norwich?

B: Да.

## 9. СИТУАТИВНЫЙ ДИАЛОГ «НА БОРТУ СУДНА»

### DIALOGUE 9. ON THE BOARD THE SHIP

**Mr. Green:** Here is your vessel, gentlemen. Have a good look at her. Isn't she a beauty?

**Chief engineer:** Oh, yes, she's wonderful. What a streamlined body! She must be quite speedy, I guess.

**Mr. Green:** Thought it's not my habit to praise our production, I must tell you that we are rather proud of this one. Now, let's come aboard, gentlemen.

**Chief engineer:** But, Mr. Green, I see that the cargo winches are not yet mounted. Why so?

**Mr. Green:** Everything will be all right, don't worry. The winches are already on board and will be mounted as soon as we get the circuit diagram for connection. I hope it won't take us more than a couple of days.

**Chief engineer:** I see. And now, if you have nothing against it, let's go down to the engine-room.

**Mr. Green:** You are welcome. This way, please. Watch out for the cables and air hoses! There are lots of them everywhere.

**Chief engineer:** Thank you. Tell me, please, are the auxiliary diesel generators in a serviceable condition?

**Mr. Green:** Sure, they are. The main switchboard is already installed and now the generators can carry loads.

**Chief engineer:** The ship is equipped with Burmeister and Wain diesels, isn't she?

**Mr. Green:** Oh, yes. Three diesels each rating 360 kW at 750 rev/min. To my mind, the B&W diesels are the best in the world.

**Chief engineer:** I also like these diesels for their reliability.

**Mr. Green:** Glad to hear it, Mr. Petrov. Well, now I'm going to introduce you to Mr. Wilde, our foreman, who is responsible for mounting and adjusting all the machinery and systems in the engine-room. He'll give you any information you need.

streamlined – обтекаемый

body – корпус

habit – привычка

praise – хвалить

be proud of – гордиться

circuit diagram – электрическая  
схема

connection – подключение

air hose – воздушный шланг

carry loads – питать энергией  
потребителей

rate – иметь номинальную мощность

to my mind – по моему мнению

reliability – надежность

foreman – мастер

adjust – настраивать

## EXERCISES

### 1. Translate the word combinations from Russian into English

Электрическая схема; воздушный шланг; устанавливать; питать энергией; иметь номинальную мощность; обтекаемый; надежность; мастер; подключение; корпус; настраивать; гордиться.

### 2. Answer the questions

1. What wasn't mounted on board the ship?
2. What should they get to mount the cargo winches?
3. Is the main switchboard already installed?
4. When can generators carry loads?
5. What diesels engines are the ship equipped with?
6. What rating do the diesels have?
7. Why does the Chief Engineer like these diesels?
8. Who is responsible for mounting and adjusting all the machinery and systems in the engine-room?

### 3. Fill the gaps

1. It's not my habit ... our production.
2. I see that the cargo winches are not ... yet.
3. The winches will be mounted as soon as we get the circuit diagram for ... .
4. Watch out for the cables and ... !
5. Are the auxiliary diesel generators in ... ?
6. The main switchboard is already ... and now the generators can ... .
7. The ship ... with Burmeister and Wain diesels.
8. Three diesels each ... 360 kW at 750 rev/min.
9. Chief engineer likes these diesels for their ... .

### 4. Translate from Russian into English

A: Here is your vessel, gentlemen. Have a good look at her.

B: Оно прекрасно. Какой обтекаемый корпус судна.

A: I must tell you that we are rather proud of this one. Now, let's come aboard.

B: Мистер Грин, я вижу что грузовые лебедки ещё не установлены. Почему?

A: The winches are already on board and will be mounted as soon as we get the circuit diagram for connection. I hope it won't take us more than a couple of days.

B: Хорошо, теперь давайте пройдем в машинное отделение.

A: This way, please. Watch out for the cables and air hoses!

B: Скажите, вспомогательные дизель-генераторы в исправном состоянии?

A: Sure, they are. The main switchboard is already installed and now the generators can carry loads.

B: Судно оснащено Бурмистер и Уэйн дизелями (двигателями), не так ли?

A: Three diesels each rating 360 Kw AT 750 rev/min. To my mind, the B&W diesels are the best in the world.

B: Да, мне тоже нравятся эти двигатели за их надежность.

## 10. СИТУАТИВНЫЙ ДИАЛОГ «В МАШИННОМ ОТДЕЛЕНИИ»

### DIALOGUE 10. IN THE ENGINE ROOM

**Chief engineer:** Mr. Wilde, I see that the auxiliary engines have already been tested under operating conditions, haven't they?

**Foreman:** Yes, you are right. They have been tested under load.

**Chief engineer:** And what about the main engine? Is it ready for the test?

**Foreman:** You see, the main engine still needs the final assembly.

**Chief engineer:** Tell me, please, what exactly is left to be done?

**Foreman:** Well, the cylinder heads are to be fitted and, besides, the cooling system and starting air system are to be installed.

**Chief engineer:** And when are you planning to start the main engine?

**Foreman:** Let me see. Tomorrow we'll begin fitting the cylinder heads, so in a fortnight, I hope, we'll be ready for starting the main engine.

**Chief engineer:** What's the problem? Why so late?

**Foreman:** The cooling pumps haven't yet arrived. The subcontractors met with some difficulties, hence this delay. But yesterday we were informed that the pumps would be sent in a couple of days. In my turn, I'll do my best to speed up the work.

**Chief engineer:** Have you got the certificates for the parts of the cylinder and piston assembly?

**Foreman:** Yes, they are ready. I mean all certificates are at your disposal.

**Chief engineer:** Is the supercharging system parallel?

**Foreman:** Yes, it is. Apart from the main turbochargers, the motor-driven compressor is switched on automatically to ensure the necessary air supply to the engine when it's running under low loads.

**Chief engineer:** The pistons are oil-cooled, aren't they?

**Foreman:** Yes, it is common practice with these diesels.

**Chief engineer:** And now I'd like to know about the protection for the main engine.

**Foreman:** I can explain that to you in the central control room. This way, please.

**Chief engineer:** O.K. I'm right after you.

**Foreman:** Mr. Petrov, you may see here the electronic protection which ensures the immediate engine stopping in case of emergency such as: Tow oil pressure, temperature increase of oil and cooling water, or if the rotational speed is more than the nominal one.

**Chief engineer:** I guess, the same kind of protection is provided for the auxiliary engines too, isn't it?

**Foreman:** You are right.

cooling system – система  
охлаждения

starting air system – система пускового  
воздуха

fortnight – две недели

hence – отсюда

delay – задержка

supercharging – наддув

general control room – центральный  
пост

управления  
(ЦПУ)

rotation speed – частота вращения



## EXERCISES

### 1. Translate the word combinations from Russian into English

Система пускового воздуха; номинальная мощность; подача воздуха; система охлаждения; частота вращения; нагрузка; запускать двигатель; задержка; быть в чьём-то распоряжении; две недели; наддув; центральный пост управления.

### 2. Answer the questions

1. Have the auxiliary engines already been tested under operating conditions?
2. Is the main engine ready for the performance test?
3. What exactly is left to be installed?
4. When is the foreman planning to start the main engine?
5. Has the foreman got the certificates for the parts of the cylinder and piston assembly?
6. Is the supercharging system parallel?

### 3. Fill the gaps

1. The auxiliary engines have already been tested under ... .
2. The main engine still needs the final ... .
3. The cylinder heads are to be ... .
4. The cooling system and ... system are to be installed.
5. When are you planning ... the main ... .
6. Tomorrow we will begin fitting the ... heads.
7. The cooling ... haven't yet arrived.
8. The subcontractors met some difficulties, hence this ... .
9. All the necessary certificates are at ... .
10. The motor -driven compressor is switched in automatically to ensure the necessary ... to the engine when it is running under low loads.

### 4. Translate from Russian into English

A: По-моему, вспомогательные двигатели уже опробованы в работе, не так ли?

B: Yes, you are right. They have been tested under load.

A: А что с главным двигателем? Готов ли он к испытаниям в рабочих условиях?

B: You see, the main engine still needs the final assembly.

A: Скажите, пожалуйста, что ещё осталось сделать?

B: Well, the cylinder heads are to be fitted and, besides, the cooling system and the starting air system are to be installed.

A: Когда планируется запуск двигателя?

B: I hope, we'll be ready for starting the main engine in a fortnight.

## 11. СИТУАТИВНЫЙ ДИАЛОГ «В БОЙЛЕРНОЙ»

### DIALOGUE 11. IN THE BOILER ROOM

**Chief Engineer:** Mr. Wilde, what I'm mostly interested in is when you are going to put the boiler in operation?

**Foreman:** It seems to me it's going to be put in operation tomorrow. Sorry, I can be more precise as the work here is carried out by another company. Now, as you can see, the boiler automatic equipment is being adjusted.

**Chief Engineer:** So the boiler is fully automated, isn't it?

**Foreman:** Yes, it is. As far as I know the automatics check the water level, control the fuel supply in case of any changes in steam consumption, etc.

**Chief Engineer:** Good. By the way, did the surveyor of the Russian Register examine the boiler?

**Foreman:** Oh, yes, he did. But only external and internal examination was carried out.

**Chief Engineer:** Sorry, but I wonder why there is no steam condenser in the boiler-room.

**Foreman:** Oh, that! You see, it's not necessary to have it because the cooling coil of the hot well provides exhaust steam condensation. At the same time the feed donkeys have the condenser. Look! It's over there, behind the boiler.

**Chief Engineer:** So that's it! It's all clear to me now. Thank you for your help and explanations.

fuel supply – подача топлива

steam consumption – расход пара

external examination – внешний  
осмотр

internal examination – внутренний  
осмотр

exhaust steam – отработавший пар

surveyor – судовой эксперт,  
инспектор  
классификационного  
сообщества

donkey – поршневой насос, донка  
the Russian Maritime Register of  
Shipping – Российский морской  
регистр судоходства

## EXERCISES

### 1. Translate the word combinations from Russian into English

Змеевик; автоматика; точный; теплый ящик; уровень воды; отработавший пар; контролировать; осмотр; изменения; внешний; расход пара; поршневой насос; конденсатор; настраивать.

### 2. Answer the questions

1. When is the foreman going to put the boiler in operation?
2. When the boiler going to be put in operation?
3. Why can't the foreman be more precise in his answer?
4. Is the boiler fully automated?
5. What does the automatic equipment control?
6. Did the surveyor of the Russian Register examine the boiler?
7. What examination was carried out?
8. Why was there no steam condenser in the boiler-room?
9. Do the feed donkeys have the condenser?

### 3. Fill the gaps

1. The boiler automatic equipment is being ... now.
2. The automatics control the fuel supply in case of any change in ... ..
3. The surveyor of the Russian Register carried out only ... and ... examination of the boiler.
4. The cooling coil of the ... provides ... steam condensation.
5. At the same time the feed ... have the ... .
6. Thank you for your help and ... .

### 4. Translate from Russian into English

A: Mr. Wilde, when are you going to put the boiler in operation?

B: Планируется ввести котёл в действие завтра. Работа выполняется другой компанией, поэтому не могу сказать точнее. Сейчас автоматика котла настраивается.

A: Is the boiler fully automated?

B: Да. Автоматика контролирует уровень воды, регулирует подачу топлива в случае любых изменений расхода топлива.

A: Did the surveyor of the Russian Register examine the boiler?

B: Да, но только внешний и внутренний осмотр был выполнен.

A: But I wonder why there is no steam condenser in the boiler-room.

B: Конденсатор не нужен, змеевик теплого ящика обеспечивает конденсацию отработанного пара. А также поршневой насос имеет конденсатор, который находится за котлом.

A: It's all clear to me now. Thank you for your help and explanations.

## 12. СИТУАТИВНЫЙ ДИАЛОГ «ОПРЕСНИТЕЛЬНАЯ УСТАНОВКА»

### DIALOGUE 11. THE WATER-DISTILLATION PLANTS

**Chief Engineer:** If I'm not mistaken, these are Atlas water-distillation plants, aren't they?

**Foreman:** Yes, they certainly are. Atlas Co. LTD has a world-wide reputation for its high quality production. These vacuum water-distillation plants are rather famous for their reliability and economy in service.

**Chief Engineer:** They sure enough must have quite a capacity, mustn't they?

**Foreman:** Oh, yes. 20 tons of fresh water per day. I mean it goes for each plant, not for the whole lot.

**Chief Engineer:** Not bad, I'd say. I hope they are completely mounted, aren't they?

**Foreman:** Surely. We'll check their operation during the delivery trials.

**Chief Engineer:** Fine! Tell me, please, are these fresh water generators steam-operated?

**Foreman:** You may say so but mainly the cooling water from the engines is used. These fresh water generators are versatile, you see.

**Chief Engineer:** All right. By the way, do all the condensers have the certificates?

**Foreman:** Oh, of course, they do. Anything else, sir?

**Chief Engineer:** No, thank you. Everything is quite clear. I hope we'll have no problems with these plants.

versatile – универсальный  
fresh water generator –  
опреснительная установка  
capacity – производительность

delivery trials – приемные ходовые  
испытания  
mount – устанавливать, собирать  
sure enough – конечно,  
без сомнения

## EXERCISES

### 1. Translate the word combinations from Russian into English

Надежность; всемирная репутация; производительность; опреснительная установка; устанавливать, собирать; универсальный; конденсатор; свидетельство; паровой; качественная продукция.

### 2. Answer the questions

1. Why does Atlas Co. LTD have a world-wide reputation?
2. What are these water-distillation plants famous for?
3. Are these plants completely mounted?
4. When will the foreman check the generators?
5. Are these fresh water generators steam-operated?
6. Why are these fresh water generators versatile?
7. Do all condensers have the certificates?

### 3. Fill the gaps

1. Atlas Co. LTD has a world-wide reputation for its ... .. production.
2. These vacuum water-distillation plants are rather famous for their ... and ... in service.
3. They must have quite a ... .
4. We'll check their in operation during the ... ..
5. These fresh water generators are ... ..
6. But mainly the ... .. from the engines is used.
7. These water-distillation plants are ... .

### 4. Translate from Russian into English

A: These are Atlas water-distillation plants, aren't they?

B: Да, конечно. Atlas Co. LTD имеет всемирную репутацию за свою высококачественную продукцию. Эти опреснительные установки известны своей надежностью и экономичны в обслуживании.

A: They must have quite a capacity, mustn't they?

B: Да, 20 тонн пресной воды в день. Это касается каждой установки, а не всех.

A: Not bad, I'd say. I hope they are completely mounted, aren't they?

B: Конечно. Мы проверим их работу во время приемных ходовых испытаний.

A: Fine! Are these fresh water generators steam-operated?

B: Да, но в основном охлаждающая вода из двигателей используется. Эти опреснительные установки универсальные.

A: All right. By the way, do all the condensers have the certificates?

B: Да, конечно, есть. Что-либо ещё, сэр?

A: No, thank you. Everything is quite clear. I hope we'll have no problems with these plants.

### 13. СИТУАТИВНЫЙ ДИАЛОГ «ТУННЕЛЬ ГРЕБНОГО ВАЛА»

#### DIALOGUE 13. THE PROPELLER SHAFT TUNNEL

**Chief engineer:** The main thing I'd like to know is who is responsible for mounting the controllable pitch propeller (CPP).

**Foreman:** It's one of our subcontractors, the Swedish company Kamewa.

**Chief engineer:** Is the control system of the CPP filled up with oil already?

**Foreman:** Yes, it is. The CPP pumps can be started at any time you like.

**Chief engineer:** Good. And how high is the oil pressure with the propeller fully turned?

**Foreman:** 35 atm.

**Chief engineer:** Look! The oil's leaking here. What's the matter?

**Foreman:** Where's it? Oh, I see. Sorry, that's my fault. But I assure you we'll stop the leak by tomorrow.

**Chief engineer:** Right, then. Mr. Wilde, what kind of the automatic control system is provided for the CPP and the main engine?

**Foreman:** The pneumohydraulic control system and manual control as well. Look! Now I'm turning the propeller blades by hand – that's the manual control. Here is "Full ahead" and now it's "Full astern". And this is the neutral or zero position.

**Chief engineer:** Thanks a lot. Well, I've heard of the Kamewa production. They say it's most reliable in operation. What's your opinion, Mr. Wilde?

**Foreman:** I'm of the same opinion. We have long-standing business relations with this company and have never had a reason to complain. That speaks for itself, doesn't it?

**Chief engineer:** Naturally. I must confess that I don't know it so well as you do, so I take your word for it.

**Foreman:** I hope you won't be disappointed.

subcontractor – субподрядчик  
controllable pitch propeller (CPP) –  
винт регулируемого шага (ВРШ)

assure – уверять

propeller shaft tunnel – туннель  
гребного вала

fill up – заправлять (горючим)

blade – лопасть

turn – разворачивать

leak – течь

Full astern! – Полный назад!

complain – жаловаться

confess – признаваться

manual control – ручное  
управление

be disappointed – разочароваться

## EXERCISES

### 1. Translate the word combinations from Russian into English

Насосы; собирать; устанавливать; Полный вперед!; жаловаться; заправлять; признаваться; лопасть винта регулируемого шага; субподрядчик; ручное управление; пневмогидравлическая система управления; надежный в работе.

### 2. Answer the questions

1. Who is responsible for mounting the CPP?
2. Is the Swedish company Kamewa the only subcontractor?
3. Is the control system of the CPP filled up with oil?
4. How high is the oil pressure with the propeller blades fully turned?
5. What is the reason for the oil leak?
6. When will the foreman stop the leak?
7. What kind of the automatic control system is provided for the CPP and the main engine?
8. What business relations do they have with Kamewa company?

### 3. Fill the gaps

- 1) Who is responsible for ... the controllable pitch propeller?
- 2) It's one of our ... , the Swedish company Kamewa.
- 3) The control system of the CPP ... with oil.
- 4) The CPP ... can be started at any time you like.
- 5) How high is the oil pressure with the propeller blades fully ... ?
- 6) What's the matter of the oil ... ?
- 7) I ... you we'll stop the leak by tomorrow.
- 8) If you turn the propeller blades by hand that's the ... ..
- 9) The Kamewa production is most reliable in ... .
- 10) We have long-standing business relations with this company and have never had a ... to ... .
- 11) I must ... that I don't know it so well as you do.

### 4. Translate from Russian into English

A: Система управления ВРШ заправлена маслом?

B: Yes, it is. The CPP pumps can be started at any time you like.

A: Какое давление масла при полном развороте лопастей винта?

B: 35 atm.

A: Смотрите! Здесь подтекает масло. В чем дело?

B: Where's it? Oh, I see. Sorry, that's my fault. But I assure you we'll stop the leak by tomorrow.

A: Хорошо. Какая система управления у ВРШ и главного двигателя?

B: The pneumohydraulic control system and manual control as well.

#### 14. СИТУАТИВНЫЙ ДИАЛОГ «В РУМПЕЛЬНОМ ОТДЕЛЕНИИ»

##### DIALOGUE 14. IN THE STEERING ROOM

**Chief engineer:** Mr. Wild, what gears do the steering engines have?

**Foreman:** They have vane-type electrohydraulic steering gears. Now, you can see that the steering engines are completely mounted and ready for service.

**Chief engineer:** Good. I take you at your word. Is it possible to test them in operation now?

**Foreman:** Certainly. Have a try.

**Chief engineer:** Will you call up the bridge and ask them to put the rudder from hard over to hard over?

**Foreman:** Just a moment. I was going to do right that.

**Chief engineer:** Thank you. I think it'll do. Now switch it off, please. And what's that?

**Foreman:** It's an emergency fire pump driven by a diesel engine rating 22 kW.

**Chief engineer:** And what's the pump capacity?

**Foreman:** 150 tons per hour.

**Chief engineer:** Can we start the pump right now?

**Foreman:** Sorry, but it's impossible as the engine isn't fuelled yet.

Steering room – румпельное  
отделение

Steering gear – рулевой привод;  
рулевое устройство

Vane-type steering engine –  
рулевая машина лопастного типа

Switch off – выключать



## EXERCISES

### 1. Translate the word combinations from Russian into English

Левый борт; рулевое устройство; аварийный; заправлять горючим; румпельное отделение; левый борт; рулевая машина; правый борт; лопастного типа; в средней части судна; переключать руль с борта на борт; вместимость; объем; номинальная мощность.

### 2. Answer the questions

1. What gears do the steering engines have?
2. Are the steering engines completely mounted?
3. How can we test the steering engines in operation?
4. How is the emergency fire pump driven?
5. What's the pump capacity?
6. Is the engine fuelled?

### 3. Fill in the gaps

1. The steering engines have vane-type electrohydraulic ... ..
2. The steering engines are completely ... and ready for ... .
3. Call up the bridge and ask them to ... .. from hard over to hard over.
4. It's an ... fire pump driven by a diesel engine.
5. The pump ... is 150 tons per hour.
6. It's impossible to start the pump right now as the engine isn't ... yet.

### 4. Translate from Russian into English

A: What gears do the steering engines have?

B: У рулевых машин электрогидравлические рулевые устройства лопастного типа. Рулевые машины полностью установлены и готовы к работе.

A: Is it possible to test them in operation now?

B: Да, конечно.

A: Will you call up the bridge and ask them to put the rudder from hard over to hard over?

B: Да, я так и планировал сделать.

A: Thank you. Now switch it off, please. And what's that?

B: Это аварийный пожарный насос, который работает от дизельного двигателя номинальной мощностью 22 кВт.

A: And what's the pump capacity?

B: 150 тонн в час.

A: Can we start the pump right now?

B: Нет, это невозможно, так как двигатель ещё не заправлен горючим.

A: Well, forget it.

## 15. СИТУАТИВНЫЙ ДИАЛОГ «АВАРИЙНЫЙ ДИЗЕЛЬ-ГЕНЕРАТОР»

### DIALOGUE 15. EMERGENCY DIESEL-GENERATOR

**Foreman:** Now, here you see the ship's emergency diesel generator. Any questions?

**Chief Engineer:** Oh, not so many. First of all, I'd like to know where it is made.

**Foreman:** This diesel generator is made in Great Britain.

**Chief Engineer:** What's its rating?

**Foreman:** 175 kW

**Chief Engineer:** Not bad, eh? And what about its cooling system? What type is it?

**Foreman:** The water radiator type. But the radiator is empty now.

**Chief Engineer:** Well, I'm not going to test the generator just now. I hope you've already started it, haven't you?

**Foreman:** Oh, yes. We checked its automatic starting system.

**Chief Engineer:** Well, I suppose that must be all for today. I'm really satisfied with everything I've seen. Thank you for the informative tour of the machinery. It was a real pleasure to have such a good guide. Now you must excuse me, I have to say a few words to the chief shipbuilder.

**Foreman:** Goodbye, sir.

empty – пустой

emergency – аварийный

rating – номинальная мощность,  
производительность

cooling system – система  
охлаждения

automatic starting system –  
автоматическая система запуска

tour – экскурсия

## EXERCISES

### 1. Translate the word combinations from Russian into English

Система охлаждения; аварийный дизель-генератор; пустой; автоматическая система запуска; номинальная мощность; экскурсия; контролировать; тип водяного радиатора.

### 2. Answer the questions

1. Where was the diesel generator made?
2. What is the diesel generator's rating?
3. What type of cooling system does the generator have?
4. Is the Chief Engineer going to test the generator (just now)?
5. Did the foreman check its automatic starting system?
6. Was the Chief engineer satisfied with everything he has seen?

### 3. Fill in the gaps

1. I'd like to know where the ship's emergency diesel generator is ... .
2. What is its ... ?
3. The type of cooling system is the ... ... type.
4. We checked its automatic ... system.
5. I ... that must be all for today.
6. Thank you for the ... ... of the machinery.

### 4. Translate from Russian into English

A: Now, here you see the ship's emergency diesel generator. Any questions?

B: Я бы хотел знать, где аварийный дизель-генератор (был) произведен.

A: This diesel generator is made in Great Britain.

B: Какая у него номинальная мощность?

A: 175 kW.

B: А какой тип системы охлаждения у генератора?

A: The water radiator type. But the radiator is empty now.

B: Хорошо, я не собираюсь проверять генератор прямо сейчас. Надеюсь, Вы его уже запускали, не так ли?

A: Oh, yes. We checked its automatic starting system.

B: Думаю, что это всё на сегодня. Я удовлетворен всем, что увидел.

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