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Севастопольский национальный технический университет

МЕТОДИЧЕСКИЕ УКАЗАНИЯ

к практическим занятиям по дисциплине
«Английский язык» для студентов IV курса
специальности «Эксплуатация судовых энергетических
установок» факультета МТС (VII семестр)
дневной формы обучения
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Методические указания к практическим занятиям по дисциплине «Английский язык» для студентов IV курса специальности «Эксплуатация судовых энергетических установок» факультета МТС (VII семестр) дневной формы обучения / Сост. Е.В. Михайлова, М.А. Зубкова, Н.В. Бритвина. – Севастополь: Изд-во СевНТУ, 2009.– 36 с.

Методические указания предназначены для практических занятий в VII семестре по дисциплине «Английский язык» по специальности «Эксплуатация судовых энергетических установок» для студентов факультета МТС IV курса дневной формы обучения. Цель методических указаний состоит в том, чтобы совершенствовать навыки по чтению, переводу и аннотированию оригинальных научных технических статей.

Методические указания утверждены на заседании кафедры практики романских и германских языков (протокол № 3 от 29.10.08г.)

Допущено учебно-методическим центром и научно-методическим Советом СевНТУ в качестве методических указаний.

Рецензент: кандидат филологических наук Скидан О.Г., доцент кафедры практики романских и германских языков СевНТУ.

СОДЕРЖАНИЕ

ВВЕДЕНИЕ

Методические указания предназначены для студентов четвертого курса специальности «Эксплуатация судовых энергетических установок» дневной формы обучения факультета МТС. Данные методические указания могут быть использованы как на практических занятиях, так и для самостоятельной работы.

Цель методических указаний состоит в том, чтобы совершенствовать приобретенные ранее знания студентов, развивать навыки по аннотированию оригинальных научных технических статей и пониманию литературы по специальности, расширять запас слов по специальности, формировать навыки речевой деятельности на английском языке на базе прочитанных текстов, развивать умения перевода оригинальной литературы по специальности и совершенствовать навыки устной речи в расширенных рамках по пройденному материалу.

В каждом уроке данных методических указаний представлен текст и лексико-грамматические, предречевые и речевые упражнения на закрепление материала урока, список слов и выражений для запоминания, а также упражнения, направленные на закрепление пройденных тем.

Методические указания состоят из 7 уроков, каждый из которых содержит текст, упражнения для закрепления грамматики и лексики соответствующего урока, а также творческие задания коммуникативной направленности. Лексический материал включает как профессионально-направленную терминологию, так и лексику на общие темы.

Методические указания рассчитаны на 28 академических часов.

1. UNIT I. Agile Singapore sisters join fleet

1. Pre-reading activity:

1) What do you know about tugs?
2) What are they used for?

2. Notes:

in excess of – свыше, более чем;
agility – быстрота;
fully laden draught – полностью нагруженная осадка;
thruster – поворотный движитель;
in-line – на одной линии;
locker – рундук;
bollard – кнехт, тумба швартовая, причальная;
pull – тяговое усилие, тяга, тянуть;
moulded – литой, спрессованный, отлитый в форме;
beam – бимс, ширина судна;
amidships – посередине корабля;
detergent – детергент, присадка, предотвращающая образование осадка;
alarm panel – панель аварийных сигналов, сигнальный щит, панель аварийной сигнализации;
bunk berth – койка (на корабле);
control console – пульт управления, стойка системы управления;
fore and aft – на носу и на корме;
exterior stair – наружная лестница.

3. Read and translate the article:

Agile Singapore sisters join fleet

KST 33 and KST 34 are the somewhat prosaic names given to the two latest azimuthing harbour tugs to join the Keppel Smit Towage fleet in Singapore. Built locally by Singmarine Dockyard & Engineering, the identical sisters each produce a bollard pull in excess of 42 tonnes, achieve a maximum free running speed of over 12 knots and demonstrate impressive agility. Of all welded steel construction to ABS requirements, each vessel is 28.10 m long, has a moulded beam and depth of 8.5 m and 4.7 m respectively and a fully laden draught of 3.5 m. The main engines, a pair of 1500 hp Niigata 6L-25HX diesels, sit well forward of amidships and

drive 360 degree Niigata thrusters at the stern of type ZP-21 with Kaplan propellers inside nozzles. A pair of Detroit Diesel 4-71T driven generators, both of 80 kVA, is unusually located in-line between the main engines. The area forward of the engine room is taken up by various tanks (including one for detergent) and lockers.

Aft of the engines on the port side is a well-insulated 'silent room' for the engineer, complete with desk and separate alarm panel console. An area has been reserved for the possible future installation of a fire pump. Ben Chew, operations manager at Keppel, confirmed to ITS Report that neither vessel was provided with any firefighting equipment but that provision was made for a full system to be quickly and easily installed at a later date. All the accommodation is on main deck level and available space has been used to advantage by arranging three cabins, containing a total of eight bunk berths, with doors which open directly into the main messroom/galley area.

The wheelhouse contains the usual control consoles and amongst the marine electronics installed are radar, echo sounder and autopilot units from Furuno and a Tokimec gyrocompass. The all round visibility is exceptional with a notable lack of any obstructions; operations at both Bodewes 100 tonne winches, fore and aft, can be clearly observed and speedy access to and from each working deck is assured by exterior stairs. The two new tugs are virtually identical to KST 31 and KST 32 built by Singmarine and delivered to Keppel Smit at the end of 1993. The success of these earlier vessels led to the order being placed for this second pair.

4. Find the synonyms to the following words in the article:

Actually, to be equipped with smth., completely, poop, in future, screw, quickness, nautical, ladder, more than, obstacle, mounting, progress, pulley, wardroom.

5. In the article find the English equivalents to the following word combinations:

Скорость хода без воза, натяжение швартового конца, консоль аварийной панели, противопожарный насос, пульт управления, противопожарное оборудование.

6. Fill in the correct word from the list below. Use the word only once and explain in English the meaning of the word combinations:

Fire, harbour, main, speedy, marine, available, bollard, control, exterior, all round, fully laden, moulded.

1) ... engines;
2) ... pump;
3) ... electronics;
4) ... tugs;
5) ... beam;
6) ... access;
7) ... visibility;
8) ... pull;
9) ... stairs;
10) ... space;
11) ... draught;
12) … console.

7. Translate the sentences into Russian, paying attention to the translation of the Passive Voice, the Infinitive and the Participle 1:

1) A pair of driven generators, both of 80 kVA, is unusually located in-line between the main engines.
2) Neither vessel was provided with any firefighting equipment but that provision was made for a full system to be quickly and easily installed at a later date.
3) KST 33 and KST 34 are somewhat prosaic names given to the two latest azimuthing harbour tugs to join the Keppel Smith Towage fleet in Singapore.
4) There are three cabins, containing a total of eight-bunk berth, with doors, which open directly into the main messroom/galley area.

8. Make up the questions to the underlined words or word combinations:

1) Of all welded steel construction to ABS requirements, each vessel is 28.10 m long, has a moulded beam and depth of 8.5 m and 4.7 m respectively and a fully laden draught of 3.5 m.
2) The main engines sit well forward of amidships and drive 360 degree thrusters at the stern of type ZP-21 with Kaplan propellers inside nozzles.
3) An area has been reserved for the possible future installation of a fire pump.
4) The two new tugs are virtually identical to KST 31 and KST 32 built by Singmarine and delivered to Keppel Smith at the end of 1993.
5) The success of these earlier vessels led to the order being placed for this second pair.

9. Translate into English using a dictionary:

1) Пространство перед машинным отделением занято различными танками (включая один для детергента) и рундуками.
2) За двигателями со стороны левого борта находится изолированная ‘тихая комната’ для механика, укомплектованная пультом управления и особым консолем аварийной панели.

3) Построенное локально, каждое из этих судов создает натяжение швартового конца свыше 42 т, достигает максимальной скорости хода без воза более 12 узлов, а также поражает своей быстротой.
4) Рулевая рубка имеет обычные пульты управления, а среди установленной морской электроники находятся радар, эхолот и приборы автопилота.
5) Все удобства находятся на главной палубе, а свободное пространство было использовано для установления 3-х кают.

10. Answer the questions:

1) What is this article about?
2) What did operation manager at Keppel confirm?
3) What results did the success of KST 31 and KST 32 have?

11. In each abstract define the sentences that contain important information.

12. Give the detailed answers to the following questions:

1) What does the article deal with?
2) What does the author dwell on?

13. Read the given below text and example of the annotation to it and after that make up an annotation for the article "Agile Singapore sisters join fleet".

Groundbreaking ferry sails with VOLVO PENTA engines

The Nordfjord, the first ferry in the world to fulfil the requirements of the "Clean Design" classification, was recently delivered by Norwegian yard Fiskerstrand to Fylkesbaatene i Sogn and Fjordane. Volvo Penta supplied the vessel's engines. The ferry will operate on the Norwegian west coast, transporting cars and passengers. Emissions are restricted by catalytic converters fitted to the propulsion engines. In this way, the ferry's total emission of nitrogen dioxides (NOX) can be reduced by as much as 45 per cent, which is well within the demands of 'Clean Design' classification. Double-hulls at all tanks minimize the risk of emissions in the case of an accident. Propulsion engines and auxiliary engines are duplicated in separate engine rooms. This means that the ferry can retain its manoeuvring capability even if one of the engine rooms is damaged. To save on weight, the entire superstructure is made of fibreglass-reinforced plastic.

Meanwhile, embarkation and disembarkation facilities are designed for maximum safety, including separate ramps for passengers and cars.

Propulsion is provided by two D49A MT and 12-cylinder marine diesel engines of 1,040 kW each. The two generators for the ferry's electrical requirements are each driven by a six-cylinder TAMD103. The engines were delivered and installed by Volvo Penta's authorised dealer J. Weiberg Gulliksen in Alesund. Elsewhere, Volvo Penta has landed a contract to supply engines for a new series of tugs in the Ukraine. This will involve deliveries of 15 diesel engines for three sister vessels which will be built this year. The engines will be installed as follows: two 65-litre propulsion engines for each tug; two seven-litre engines for powering gen sets; one six-litre engine for operating the fire pumps on board each tug. "This order is an excellent illustration of what we can achieve with our new and more extensive product programme in the marine commercial market", says Volvo Penta's Bertil Börjesson, manager for the programme. The tugs, which will be more than 30 m long, will also be used as fire-fighting vessels. They will be stationed in Yuzhny, which is situated in the Odessa region in southern Ukraine.

The first vessel in the series is currently being built at Chernomorsky Shipbuilding in Nikolayev in the Ukraine. The engines for this vessel, which will be ready for delivery during the first half of 2002, have recently been delivered. The other two vessels will be delivered before the end of the year.

Example of annotation:

The text is headlined "Groundbreaking ferry sails with VOLVO PENTA engines". This text deals with the modified Volvo Penta engines.

In the main part of the text the author gives information about modern machinery installed on Norwegian ferry Nordfjord, technical parameters of this machinery and its advantages. Also the paper presents the Contract between Volvo Penta and Ukrainian companies. The text describes the characteristics of the engines to be delivered to Ukrainian vessels.

In conclusion the text points out the purpose of the ships, their locations and terms of completion.

The clichés below will help you:
The article deals with...
The article is concerned with...
The paper is devoted to...

The author emphasizes the ideas that...
The main idea of the article is...
The author believes/points out that...
The author investigated...

It is known as a fact that...
It is clear that...
It goes without saying...

In conclusion the author of the annotation can represent his own point of view concerning the paper/article:

It is known as a fact that …	It is generally believed that …
There can be no doubt that …	It is clear that …
It may be assumed that …	It goes without saying …

2. UNIT II. Klyne invests in Anglian Man

1. Give the detailed answers to the following questions:

1) What types of ships do you know?
2) What are their functions?

2. Notes:

berthing – постановка на якорь, швартовка; постановка к причалу, место стоянки судна;
dredging – драгирование;
towing hook – буксировочный крюк;
navigational aids – навигационное оборудование;
aids – вспомогательные средства;
package – комплект, набор;
to lead off – открывать, начинать;
fixed pitch – фиксированный шаг
gearbox – редуктор;
power pack – блок питания, (портативный) источник питания;
lead off – начинать, открывать;

pitch propeller – воздушный винт;
pack – корпус;
salvage – спасение.

3. Read and translate the article:

Klyne invests in Anglian Man

Busy UK operator Klyne Tugs has taken delivery of Anglian Man, the first ever brand new tug to be built for the company. Of the 19.5 m Stan Tug 1906 type from Damen Shipyard, the vessel is not only equipped for towing and berthing but also features a removable A frame for plough dredging and 30 ton stern roller for anchor handling. A 10 ton Kraaijeveld winch on the aft main deck handles the plough and both towing and anchor handling functions whilst smaller anchor winch from the same manufacturer is located at the bow.

The wheelhouse has a central wheel position surrounded by a battery of navigational aids from Furuno including FR 8050 radar, GP 70 navigator, FE 606 echo sounder and NX 500 Navtex. A Robertson AP45 autopilot and two Sailor VHFs complete the package. A more than adequate seating/dining area is incorporated at the rear of the wheelhouse immediately adjacent to stairs leading to the galley, captain's cabin and three person crew cabin. The toilet and shower room leads off a closed corridor to the engine room. The entire accommodation area is centrally heated.

Two Caterpillar 3412TA diesels developing 671 hp at 1800 rev/min drive 1500 mm bronze 3-bladed fixed pitch propellers in nozzles through a 4.9:1 Reintjes gearbox. On trials *Anglian Man* produced a bollard pull of 17.5 tonnes and achieved a maximum speed of 10.9 knots. A Lister CRK3 diesel drives a Stamford generator providing electrical power to the extent of 27.5 kVA whilst the port main engine drives a hydraulic power pack for the deck machinery. The new tug brings Klyne's fleet up to six, the most famous being *Anglian Earl* and the 100+ tonne pull *Anglian Duke*, both of which have been involved in a number of recent towage and salvage incidents. Carl Beare, the company's operations director told *ITS Report*: "*Anglian Man* is currently involved with work at the UK end of a new BT cable being laid across to Holland".

4. Find the synonyms to the following words in the article:

Supply, to be placed, messroom, auxiliary facilities, cargo, set, active, ladder, popular, stateroom, observing, directly, pitch house, caboose, rescue, producer.

5. In the article find the English equivalents to the following word combinations:

Кормовой ролик; функция управления якорем; безопасный рабочий груз; маленькая шахта для спуска и подъема оборудования на судно для морской добычи полезных ископаемых; наблюдательная работа; центральное положение штурвала; каюта для команды из 3-х человек; гребной винт нерегулируемого шага; оборудование палубы; главный двигатель левого борта.

6. Fill in the correct word from the list below. Use the word only once and explain in English the meaning of the word combinations:

Maximum, towage, moon, adequate, navigational, anchor, plough, survey, cargo, deck, stern, electrical.

1) ... aids;	4) ... hook;	7) ... machinery;	10) ... handling;
2) ... pool;	5) ... speed;	8) ... work;	11) ... dredging;
3) ... roller;	6) ... power;	9) ... incidents;	12) … seating.

7. Translate the sentences into Russian, paying attention to the translation of the Passive Voice and the Infinitive:

1) A 10-ton winch on the aft main deck handles the plough and both towing and anchor handling functions whilst a smaller anchor winch is located at the bow.
2) Both tugs have been involved in a number of recent towage and salvage incidents.
3) The vessel is not only equipped for towing and berthing but also features a removable A frame for plough dredging and 30 ton stern roller for anchor handling.
4) The entire accommodation area is centrally heated.
5) UK operator Klyne Tugs has taken delivery of Anglian Man, the first ever brand new tug to be built for the company.

8. Answer the questions:

1) What is the vessel equipped for?
2) What does the aft main deck handle?
3) What do the navigational aids include?
4) What do two Catepillar diesels drive?
5) Where have the most famous tugs been involved?
6) What is Anglian Man involved with now?

9. Choose any sentence from the article and make up all types of questions to it.

10. Translate into English using a dictionary:

1) Более чем достаточная территория, предназначенная для сидячих мест/столовой, находится в задней части рулевой рубки, которая непосредственно примыкает к лестнице, ведущей к камбузу, капитанской каюте, а также к каюте для команды из 3-х человек.
2) Находясь на испытательном сроке, судно создало напряжение швартового конца 17.5 т и достигло максимальной скорости 10.9 узлов.
3) Рулевая рубка имеет штурвал, расположенный по центру, окруженный группой навигационных вспомогательных средств, включающих радар, навигатор, эхолот и др.
4) Палубный кран с безопасным рабочим грузом 0.45 т присоединен к левой стороне главной лебедки и находится рядом с маленькой шахтой для наблюдательных работ.
5) Дизель управляет генератором, который вырабатывает электроэнергию до 27.5 кВт, в то время как главный двигатель левого борта управляет мощным гидравлическим корпусом для машинного оборудования палубы.

11. In each abstract define the sentences that contain the most important information.

12. Give the detailed answers to the following questions:

1) What does the article deal with?
2) What does the author dwell on?

13. Make up an annotation for the article. The clichés below will help you:

The paper poses the problem of …
The article is headlined …
The article dwells upon …
The author put forward …
The author worked out (developed, gave) …

The paper discusses the important problems of …
The paper puts forward (analyses) …

3. UNIT III. Three for Ghana ... and New Caledonia

1. Pre-reading activity:

1) What are the tugs used for?
2) What are they equipped with?

2. Notes:

following – вследствие, вслед за …;
primarily – прежде всего;
chine hull – острая скула (*место соединения днища и боковых стенок судна*);
array – ряд, группа;
oil boom – нефтезадерживающий бон (*при разливе нефти*);
containment – вместимость, объём, герметичность;
reel – катушка;
skimmer – плавательное судно, развивающее большую скорость и имеющее небольшое водоизмещение;
the bulk – большая часть;
marginally – минимально;
to chamfer – закруглять, округлять;
exhaust trunk – выхлопная труба.

3. Read and translate the article:

Three for Ghana ... and New Caledonia

Following a successful trials programme, three identical tugs of Damen's Stan Tug type 3008 have been handed over to the Ghana Ports & Harbour Authority. Nana Kobina Nketsia IV will be employed at Takoradi whilst

Manheam and Ephraim Amu are to be stationed at Tema. The vessels are primarily required for docking and escort work but have been well equipped for both firefighting and oil recovery. Each 30.20 m single chine hull has a beam of 8.03 m and is powered by a pair of Cummins KTA 50M V16 diesel engines rated at 993 kW at 1800 rev/min coupled to 5.9:1 ratio Reintjes gearboxes. These drive Pro Marin 2050 mm diameter fixed pitch propellers in nozzles lined with stainless steel rings.

Cummins engines are also used to supply the auxiliary power and drive the fire pump. Two Stamford generators with an output of 62.5 kVA are powered by 6BT 5.9M diesels whilst a 6BTA 5.9M is coupled to a Sihi Nowa firefighting pump capable of delivering 240 cu m/hr to a manually operated monitor.

All the vessels are provided with a comprehensive array of oil recovery equipment. A 200 m Vikoma Sentinel oil containment boom is stored on a removable hydraulically operated reel located on the aft deck. Oil can be recovered and transferred to special tanks with capacity of 9.8 cu. m by a Vikoma floating disk skimmer and associated pump. An ergonomically designed control console is centrally located giving the helmsman excellent all round visibility. Furuno supplied the bulk of the marine electronics including daylight radar, echo sounder, SSB and VHF radios, and Navtex receiver.

The vessels are fully air-conditioned and, although designed for ease of operation with a small crew, they have sleeping accommodation for twelve with two mess rooms and two galleys.

Jean Marie. Yé Yé and Eloi are three 15 m coastal tugs completed in just seven months by Ship Constructors of Whangerei, New Zealand. The vessels have all now made the 1200-mile delivery trip to Noumea, capital of New Caledonia, and into the hands of owner, Nord Industrie Service.

According to Ship Constructors' general manager Kelvin Hardie, the tugs, which are identical, were designed in-house with simplicity and good maneuverability as the primary objectives. A pair of 365 hp Caterpillar 3406C diesels turns 1,250 mm four-bladed propellers inside fixed nozzles through Twin Disc MG 514C gearboxes with a reduction ratio of 4.5:1. This configuration enables the vessels to attain a free running speed of 11 knots and a bollard pull ahead of marginally over 11 tonnes. Optimal handling characteristics from this standard layout have been achieved by the use of a double rudder arrangement behind each nozzle controlled by Wagner steering gear.

Forward of the engine room is a large cabin with four berths arranged around the sides. A ladder leads directly to the galley and mess area which is located aft of the wheelhouse on main deck level. There is access from the aft end of the messroom directly to the working deck and three steps forward lead to the raised wheelhouse, which has a central command position. Sliding doors both sides of the wheelhouse open onto the broad side decks. Interestingly, the toilet, washroom and shower facilities can only be reached from the port side deck. The rear profile of the steel superstructure is chamfered to give a good line of sight aft; the only minor blind spot being caused by the central combined exhaust trunk.

4. In the article find the English equivalents to the following word combinations:

Добыча нефти; корпус однопрофильного типа; кольца из нержавеющей стали; брус для сдерживания нефти; плавающее дисковое устройство для собирания пролитой нефти с поверхности воды; конструкция двойного руля; широкие палубы; незначительный участок плохой видимости.

5. Find the synonyms to the following words in the article:

Aim, extraction, to obtain, simplicity, completely, accommodation, bobbin, visibility, insignificant, to be able to, first of all, subsidiary, pipe, anti-fire twin.

6. Fill in the correct word from the list below. Use the word only once and explain in English the meaning of the word combinations:

Standard, good, comprehensive, steering, command, daylight, all round, sliding, escort, coastal, oil, exhaust.

1) ... work;	4) ...gear;	7) ... position;	10) ... tugs;
2) ... trunk;	5) ... doors;	8) ... recovery;	11)...maneuverability;
3) ... layout;	6) ... radar;	9) ... visibility;	12) … array.

7. Translate the sentences into Russian, paying attention to the translation of the Passive Voice, the Infinitive and the Participle 2:

1) Cummins engines are also used to supply the auxiliary power and drive the fire pump.
2) All the vessels are provided with a comprehensive array of oil recovery equipment.

3) The tugs, which are identical, were designed in-house with simplicity and good maneuverability as the primary objects.
4) The rear profile of the steel superstructure is chamfered to give a good line of sight aft.
5) The gearboxes drive fixed pitch propellers in nozzles lined with stainless steel rings.
6) Forward of the engine room is a large cabin with four berths arranged around the sides.

8. Make up the questions to the underlined words or word combinations:

1) Following a successful trials program, three identical tugs have been handed over to the Ghana Ports and Harbour Authority.
2) A 200 m oil containment boom is stored on a removable hydraulically operated reel located on the aft deck.
3) Furuno supplied the bulk of the marine electronics including daylight radar, echosounder and Navtex receiver.
4) Jean Marie, Yé Yé and Eloi are three 15 m coastal tugs completed in seven months by Ship Constructors of Whangerey.
5) Sliding doors both sides of the wheelhouse open onto the broad side decks.

9. Translate into English using a dictionary:

1) Нефть можно получить и передать в специальные танки вместимостью 9.8 $м^3$ посредством плавающего дискообразного сепаратора и соответствующего насоса.
2) Эргономически спроектированный пульт управления расположен по центру, предоставляя рулевому превосходную видимость.
3) Суда полностью кондиционированы и, хотя они разработаны для того, чтобы упростить работу с маленькой командой, они имеют спальные комнаты для 12 человек, две столовые и два камбуза.
4) Суда, прежде всего, предназначены для докования и эскортных работ, но они также хорошо оснащены как для пожаротушения, так и для добычи нефти.
5) Оптимальные грузоподъемные способности при таком стандартном расположении были достигнуты при использовании двойной рулевой конструкции, находящейся позади каждой форсунки, управляемой рулевым устройством.

10. Answer the following questions:

1) Where will the tugs be employed?
2) What are the vessels required for?
3) What are Cummins engines used for?
4) Where can oil be transferred?
5) What are the vessels designed for?
6) Where did Jean Marie, Yé Yé and Eloi make delivery trip?
7) What are the primary objectives of the tugs?
8) What does the configuration of the vessels enable?

11. In the article define the abstracts that contain important information.

12. Give the detailed answers to the following questions:

1) What does the article deal with?
2) What does the author dwell on?

13. Make up an annotation for the article. The clichés below will help you:

The paper is concerned with …
The chapter discusses the imporatnt problem of …
In this paper … are stated

In this paper the author showed (proved/found out) that …
The aiuthor expresses his viewpoint …
The author made a great contributuon to …

The author comes to the conclusion that …
Upon reading the paper, one realizes that …
In conclusion the paper points out that …

4. UNIT IV. Charging with Refrigerant

1. Pre-reading activity:

1) What kinds of refrigerants do you know?
2) Where are they used?

2. Notes:

refrigerant – хладагент;
to charge – заливать, загружать;
expansion valve – расширительный клапан;
charging valve – загрузочный клапан;
provision – обеспечение;
service valve – рабочий клапан;
suction gauge – вакуумметр, вакуумный манометр;
suction side – сторона всасывания; сторона низкого давления;
stem – стержень; шток;
to screw out – вывинчивать;
to back seat against smth. – в обратном направлении от чего-либо;
charging pipe – загрузочная труба;
gas bottle – газовый баллон;
loosely – свободно, без сцепления;
to purge – продувать;
to tighten – сжимать; затягивать;
union – муфта;
vapour – пар; пары; испарения;
gas bottle – газовый баллон;
liquid line – напорная линия;
charging pipe – загрузочная труба;
to incline – наклонять;
spring balance – пружинные весы;
to ascertain – выяснять, устанавливать.

3. Read and translate the article.

Charging with Refrigerant

In any plant the best point at which to add refrigerant is just after the expansion valve and most large plants have a charging valve fitted at this point.

For small plants the only provision for charging may be a service valve also used for connection to a suction gauge. To charge through such a valve, the stem is first screwed out as far as possible to back seat against the gauge connection. The charging pipe from the gas bottle is loosely attached to the connection and some gas blown to purge air out of the pipe before tightening the union. The service valve is screwed inwards about 1 turn and the compressor started. When charging into the suction side of the

compressor, gas bottles must be upright so that only the vapour and NOT liquid is drawn into the plant. For larger plants, charging into the liquid line or after the expansion valve a similar procedure of purging the charging pipe is necessary, but it is best to feed liquid refrigerant into the system and the gas bottle should be inclined with its outlet valve at the bottom. Each bottle should be weighed on a spring balance before and after charging to ascertain the weight of charge introduced. Spare gas bottles should be weighed every few months to check that none has a leaking valve.

4. Find the synonyms to the following words in the article and give yours:

Place, unit, to equip, link, tightly, fastened, to run, vertically, to find out, to control.

5. Fill in the correct word from the list below. Use the word only once and explain in English the meaning of the word combinations:

Leaking, charging, union, suction, liquid, purging, gas, spring, loosely.

1) tighten the …;
2) a procedure of …;
3) a … valve;
4) … attached;
5) … bottle;
6) the provision for …;
7) balance;
8) gauge;
9) refrigerant.

6. Give the English equivalents to the following words: необходимо, следовать, цель, образец, относительно, следовательно, в зависимости от чего-либо, изделие.

7. Translate into English using a dictionary:

1) Какое давление всасывания и нагнетания компрессора?
2) Какое допускается минимальное давление масла?
3) Если компрессор выключается по низкому давлению всасывания:
   - проверьте уровень фреона в ресивере;
   - проверьте испарители в камерах, нет ли там обмерзания.
4) При пуске компрессора после ремонта необходимо залить масло в компрессор и заправить систему хладагентом, при этом следует выпустить воздух из системы. При заправке системы запрещается нагревать газовый баллон.
5) Если система не герметична, то она может дать течь; чтобы устранить утечку необходимо на ощупь проверить все соединения, если соединения имеют следы масла, то их следует зажать.

8. Choose any sentence from the article and make up all types of questions to it.

9. Answer the questions:

1) What is the best point to add the refrigerant?
2) What is a service valve used for?
3) What should be first done to charge through a service valve?
4) How should the gas bottle be disposed when charging a larger plant?
5) How often and for what purpose should the gas bottle be weighed?

10. Make up an annotation (summary) for the article. The clichés below will help you:

The paper is headlined …
The paper deals with/is devoted to the problem of …
The artile poses the problem of …

The author suggested …
The author put forward …
The author gave a comprehensive/detailed analysis of …

The article surveys briefly …
The paper presents some interesting facts concerning …
The article reviews the literature to the problem …

5. UNIT V. Safety Procedures

1. Pre-reading activity:

1) What do you know about Safety Procedures?
2) What is a bursting disc?

2. Notes:

cut-out – предохранительный клапан;
failure – сбой, повреждение, отказ;
bursting disk – разрывная мембрана;
gauge – мера;
reading – показание (прибора);
differential pressure – перепад давления;
crankcase – картер, кривошипная камера, блок цилиндров;
relative to – относительно;

discharge manifold – выпускной, напорный коллектор, нагнетательная / напорная магистраль, нагнетательный манифольд, напорный патрубок (насоса);
suction manifold – всасывающий коллектор;
fatigue – усталость;
stainless steel – нержавеющая сталь.

3. Read and translate the article:

Safety Procedures

Plants are protected by high-pressure cut-outs, low pressure cut-outs, oil failure cut-outs, and safety valves or busting discs.

High-pressure cut-outs are usually set to the pressure corresponding to 49°C (120°F), i.e. about 5°C (10°F) above highest expected condenser gauge. Low-pressure cut-outs should be set about 5°C (10°F) below the lowest expected evaporation gauge reading.

Oil failure cut-outs are differential pressure devices as crankcase pressure is not atmospheric and oil pressure is determined relative to crankcase pressure.

Bursting discs are fitted internally between discharge and suction manifolds on many compressors. Double bursting discs, with a pressure gauge connected between them are sometimes used to protect the high-pressure side of the system. The reason for fitting two discs is that eventually discs develop slight leaks, caused by fatigue, and the refrigerant charge can slowly escape. Gauges should be inspected daily and should read zero. If any gauge shows a reading, the first of the pair of discs is leaking and should be replaced.

Bursting discs are usually made of thin stainless steel, and in event of failure must be replaced with the same material of the same thickness.

4. In the article find the English equivalents to the following word combinations:

High pressure cut-out, oil failure cut-out, the highest expected condenser gauge, the lowest expected evaporation gauge reading, low pressure cut-out, double bursting discs, the high pressure side.

5. Find the synonyms to the following words in the article:

To safeguard, conforming to, concerning, inwardly, collector, ultimately, to produce, to leak, to examine, indication, to displace, in case of, identical.

6. Choose the correct equivalent to the Russian word:

1) соответствовать – corresponding, correspond, correspondence;
2) ожидание – expected, expect, expectation;
3) бесполезный – useful, useless, used, usefulness;
4) загрузка – charge, charging, charged;
5) случай – eventual, event, eventually.

7. Answer the following questions:

1) What are the plants protected by?
2) What pressure are the high-pressure cut-outs usually set to?
3) Why are oil failure cut-outs differential pressure devices?
4) What is the reason for fitting two discs?
5) With what must bursting discs be replaced in event of failure?

8. Make up the questions to the underlined words or word combinations:

1) Different types of cut-outs protect plants.
2) A crankcase pressure is atmospheric.
3) Oil pressure is determined relative to crankcase pressure.
4) Bursting discs are fitted between discharge and suction manifolds.
5) Double bursting discs are used to protect the high-pressure side of the system.
6) The refrigerant charge can slowly escape.
7) Gauges should be inspected daily and should read zero.
8) The pair of discs is leaking and should be replaced.
9) Bursting discs are usually made of stainless steel.
10) Bursting discs must be replaced with the same material.

9. Translate into English using a dictionary:

1) Любые холодильные установки имеют защиту по высокому давлению сжатия, низкому давлению всасывания и низкому давлению смазочного масла.
2) Холодильные установки для предупреждения аварии имеют автоматику, которая отключает компрессор в следующих случаях:
   - превышения максимального давления нагнетания;
   - превышения минимального давления всасывания;
   - превышения минимального давления масла.

   Если система не сработает, то это приведет к аварии компрессора.

3) При эксплуатации холодильной установки необходимо контролировать показания приборов, в случае отклонения параметров, следует произвести регулировку автоматики.
4) В случае обмерзания всасывающего коллектора следует проверить работу ТРВ (терморегулирующий вентиль – thermostatic expansion valve).
5) Арматура трубопроводов обычно изготавливается из нержавеющей стали, но в результате усталости возможны повреждения.

10. Choose any sentence from the article and make up all types of questions to it.

11. Make up an annotation for the article.

6. UNIT VI. Brine Systems

1. Pre-reading activity:

1) What do you know about brine systems?
2) Where can brine systems be installed?

2. Notes:

brine refrigerating system – рассольная система охлаждения;
refrigeration plant – холодильная установка;
oil recovery – регенерация масла;
evaporator – испаритель;
calcium chloride – хлорид кальция;
distribution valve – распределительный клапан;
cross-connection – перекрёстная связь;
head tank – напорный танк;
to allow for – предусматривать; учитывать;
contraction – сжатие; сужение;
air vent – вентиляционное отверстие; воздушный канал;
return header – рециркуляционный (возвратный) колектор;
to defrost – размораживать;
refinement – очистка;
bypass – обводная труба; обходной (перепускной) канал;
brine solution – концентрированный раствор хлористого натрия, концентрированный соляной раствор, рассол.

3. Read and translate the article:

Brine Systems

Refrigeration plants using a "secondary refrigerant" are usually fitted for large installations. The secondary refrigerant is a liquid, which is cooled in the refrigeration machinery room and pumped around the ship to batteries in each cargo space. The main advantages of this arrangement compared to direct expansion are:

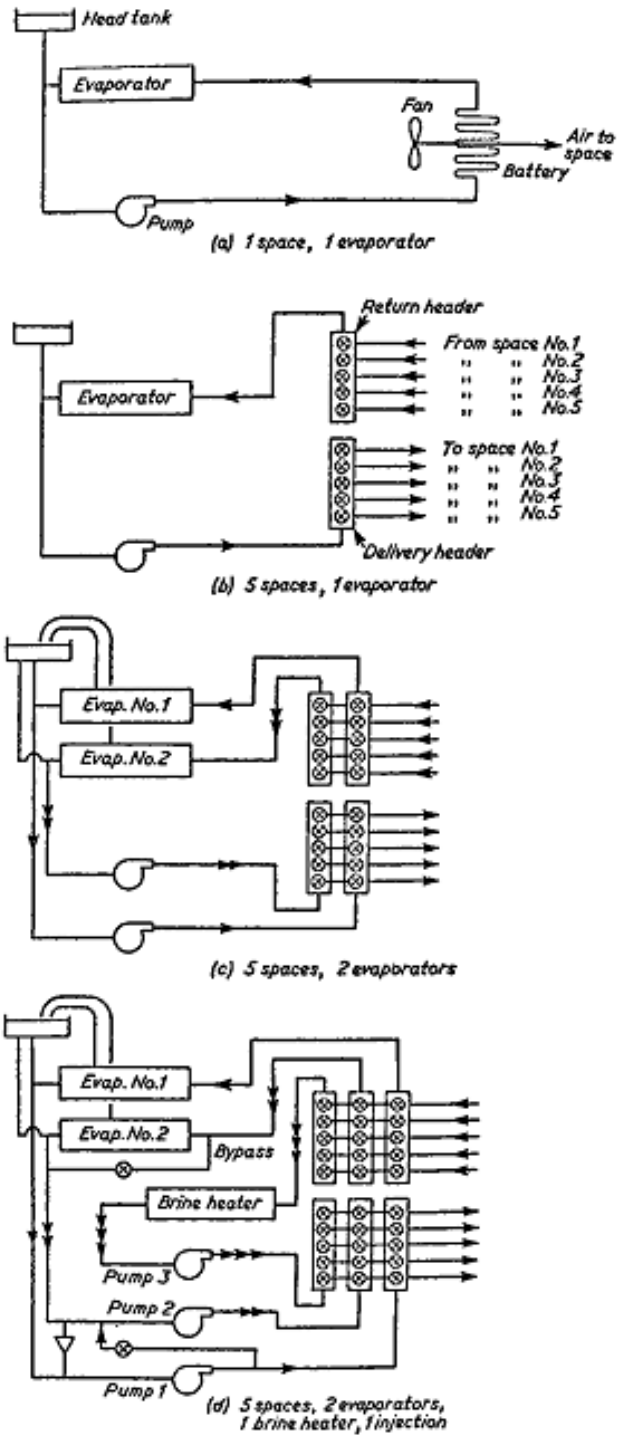

Fig. 1 Brine circulation diagram

a) the primary refrigerant is only present in the machinery space, and the risk of loss by leakage more readily controlled;
b) difficulties of oil recovery from evaporators half a ship's length away from the compressors are avoided;
c) the brine system is more easily controlled to give accurate temperature control; if a manual system, less skilled operators are required; if an automatic system, simpler automatic controls can be used;
d) greater flexibility in simultaneously carrying cargoes at different temperatures in different spaces is possible.

Calcium chloride/brine is the commonest secondary refrigerant used for cargo ships, water is used for air conditioning installations (with suitable safeguards to prevent its freezing) and trichloroethylene is used for very low temperature installations, such as fishing trawlers.

The evaporators (brine coolers), pumps and distribution valves on cargo ships are usually located together within an insulated brine

room, to provide ease of access and to eliminate the need for insulating individual items and pipes.

The system is basically very simple; the complexity arises from duplication of components and alternative cross-connections.

Figure 1 attempts to illustrate the development of a brine system. Figure 1 Part (a) is the basic diagram with one cargo space battery circulated with brine from one evaporator, in a closed circuit with a head tank to allow for expansion and contraction of the brine. Part (b) shows the addition of headers which enable a number of spaces to be served; (c) shows the addition of a second evaporator, air vent pipes have also been added at this stage. Part (d) shows the addition of a third pair of headers served by a brine heater and third pump, so that any battery can be individually defrosted by circulating the warm brine. Also introduced is a brine 'injection' cross connexion from the delivery of pump No.1 to the suction of pump No.2 when No.1 is set to deliver brine at a lower temperature than No.2. A further refinement of this injection is the by-pass arranged across the inlet and outlet of evaporator No.2 so that the cooling of the brine circulating in No.2 system can be achieved entirely by injection if desired.

The density of the brine solution used has to be increased as the minimum temperature to be used decreases.

4. Find the English equivalents to the following words:

Вспомогательный хладагент; грузовой трюм; по сравнению с; машинное отделение; потери при утечке; на расстоянии в половину длины судна; система ручного управления; система автоматического управления; гибкость; соответствующие меры безопасности; обеспечить легкость доступа; устранять необходимость; дублирование компонентов; замкнутая цепь; добавление коллекторов; впрыск; соляной раствор.

5. Find the synonyms to the following words:

Benefits, to escape, precise, at the same time, situated, to obviate, mainly, to reach.

6. In the article find the English equivalents to the following word combinations:

Refrigeration machinery room, air conditioning installations, one cargo space battery, a brine injection cross-connection.

7. Choose the correct equivalent to the Russian word:

1) метод – methodic, method, methodize;
2) явление – appear, appearingly, appearance;
3) распределять – distribute, distributable, distributary;
4) очищать – refinement, refine, refiner;
5) налаживать – adjuster, adjust, adjustable.

8. Translate into English using a dictionary:

1) На флоте используются не только фреоновые, но и холодильные установки. Аммиачная установка использует в качестве хладагента рассол, поэтому она принципиально отличается от фреоновых установок.
2) При подготовке к пуску рассольной системы необходимо подготовить и пустить в работу по рассольный насос, и проверьте его работу по показанию КИП (контрольно-измерительные приборы).
3) Температура рассола регулируется автоматично или вручную.
4) При работе установки необходимо проверять и поддерживать в требуемых пределах концентрацию РН и чистоту рассола.
5) Полностью удалите воду и рассол из теплообменных аппаратов, компрессоров, трубопроводов охлаждающей воды и рассольной системы.

9. Answer the questions:

1) What kind of refrigeration plants is usually fitted for large installations?
2) What is “secondary refrigerant”?
3) What are the main arrangement advantages of the liquid circulation?
4) What is the commonest secondary refrigerant used for cargo ships?
5) Why are evaporators, pumps and distribution valves located together?
6) What additions do parts *b*, *c*, *d*, show?
7) Why has the density of the brine solution to be increased?

10. In each abstract define the sentences that contain the important information.

11. Make up an annotation for the article.

7. UNIT VII. Calcium Chloride/Brine

1. Pre-reading activity:

1) What is a hydrometer?
2) Where is caustic soda used?

2. Notes:

make-up tank – подпиточный танк, наполнительный бак, дополнительный / сглаживающий резервуар;
to suffer – испытывать, подвергаться;
interface – контактная поверхность;
alkaline – щелочной;
caustic soda – каустическая сода;
litmus test paper – лакмусовая бумага;
additive – добавка, примесь;
sodium dichromate – дигидрат дихромата натрия;
determination – определение; измерение; вычисление;
blockage – блокировка, закупоривание.

3. Read and translate the article:

Calcium Chloride/Brine

In using the hydrometer, the brine sample should be at 15°C (60°F) as the instrument is calibrated for use at this temperature. In the absence of air, calcium chloride is not corrosive (steel brine pipes remain in good condition internally, but steel brine head and make-up tanks suffer severe corrosion at the brine/air interface). However, it is desirable to keep the brine slightly alkaline, with pH between 8.0 and 8.5. Caustic soda should be added if found to be acid (e.g. litmus test papers).

A further anti-corrosion procedure is to include an additive in the brine solution, sodium dichromate being suitable. Unfortunately, there is no simple method for determination of sodium dichromate concentration, and a sample of brine should be sent ashore for analysis at least every six months when this treatment is being used.

Brine heaters contain steam-heated coils within a shell through which brine is circulated. When warm brine is required for defrosting, the steam should be put on first and the brine flow restricted by first cracking the inlet brine valve until the brine has risen in temperature to above 0°C (32°F). An initial high flow rate of cold brine can cause freezing of the steam

condensate with subsequent blockage. A brine temperature of 43°C (110°F) is suitable for defrosting.

4. Find the English equivalents in the article:

Калиброванный для использования; оставаться в хорошем состоянии; изнутри; подвергаться сильной коррозии; желательно; подходящий; к сожалению; отправить на берег; обработка; требоваться для размораживания; спирали, нагреваемые паром; скорость потока; привести к замерзанию.

5. Fill in the correct word from the list below. Use the word only once and explain in English the meaning of the word combinations:

Brine, air, sample, steam, anti-corrosion, high, good, coils, severe.

1) … procedure;
2) … condition;
3) … solution;
4) the absence of …;
5) … corrosion;
6) brine …;
7) … flow rate;
8) steam-heated…;
9) ... condensate.

6. Translate into English using a dictionary:

1) Гидрометр калиброван для использования при температуре 15°C (60°F).
2) Необходимо добавить каустическую соду, в случае обнаружения кислоты.
3) Дигидрат дихромата натрия является подходящей добавкой к соляному раствору при процедуре преобразования ржавчины.
4) При такой обработке необходимо каждые шесть месяцев отправлять образец рассола на берег для исследования.
5) Причиной замерзания конденсата пара может стать изначально высокая скорость потока холодного рассола.

7. Give the synonyms to the following words:

Unit, set, task, to appear, to break, nozzle, equipment, crack, solution, coupling, to decide, in accordance with smth., to fulfill, to copy, delivery, to discharge, to repair., vessel, drive, speed, turn, viscosity, to fit.

8. Make up the questions to the underlined words or word combinations:

1) Brine heaters contain steam-heated coils within a shell through which brine is circulated.
2) It is desirable to keep the brine slightly alkaline.
3) There is no simple method for determination of sodium dichromate concentration.
4) A brine temperature of 43°C is suitable for defrosting.
5) A further anti-corrosion procedure is to include an additive in the brine solution, sodium dichromate being suitable.

9. Answer the questions:

1) What should be the temperature of the brine sample while using the hydrometer? Why?
2) What additive to the brine solution is suitable for a further anti-corrosion procedure?
3) How often should the sample of brine be sent ashore for analysis?
4) What do brine heaters contain?
5) What can an initial high flow rate cause?

10. In each abstract define the sentences that contain the important information.

11. Make up an annotation for the article.

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ПРИЛОЖЕНИЕ А

LIST OF ABBREVIATIONS

A, a – ampere - ампер (А)
A – Angstrom - ангстрем (10^{-8} см. 10^{-10} м)
A.C. (a.c.) – alternating current - переменный ток
acct – account - счет
a.f. – audio frequency - звуковая частота
A.F.C. – automatic frequency control - автоматическая подстройка частоты (АПЧ)
Agt – agent - агент, представитель
a-hr – ampere-hour - ампер/час
a/r – at the rate of – со скоростью, при норме, в количестве
bhp – break horse power - эффективная лошадиная сила
C. – centigrade - градус Цельсия
Cal – kilogram-calorie - большая калория
CC, cc – Chamber of Commerce - Торговая палата; – copy – копия
CIF, cif – cost, insurance, freight – цена, включающая стоимость, расходы по страхованию, фрахт
cm. p. s. – centimetres per second - см/сек
c.p. – candle power - свеча
cpp – controllable pitch propeller - винт регулируемого шага
c.p.s. – cycles per second - герц (Гц)
db – decibel - децибел
D. C. (d. c.) – direct current - постоянный ток
dia. – diameter - диаметр
dm. – decimetre - дециметр
DWT, dwt – deadweight - полная грузоподъемностьб дедвейт
ECR – economic continuous rating - длительная экономическая мощность
e.g. – exempli gratia – for example - например
emf – э. д. с.
ETA – expected time of arrival - предполагаемое время прибытия судна
ETD – estimated or expected time of departure - предполагаемое время отхода судна
etc. – и т.д.
F – farad – Fahrenheit - 1) фарада, 2) градус Фаренгейта
f.s.d. – full size detail - деталь в натуральную величину
ft – foot, feet - фут, футы
g – gram - грамм
gal – gallon - галлон
g.r. – gear ratio - передаточное число, отношение
h.f. (r.f.) – high frequency (ratio frequency) - звуковая частота
HFO – Heavy Fuel Oil - тяжелое топливо
hi-fi – high fidelity - высокая точность звукопроизведения
h.p. – horsepower - лошадиная сила; – high pressure - высокое давление
hr (**hrs**) – hour (hours) - час (часы)
h.v. – high voltage - высокое напряжение
IAW – in accordance with - в соответствии с чем-либо
i.c. – internal combustion - внутреннего сгорания(о двигателе)

i.e. – id est = that is - то есть
i.f. – intermediate frequency - промежуточная частота
j – joule - джоуль
kc/s – kilocycles per second - килогерц
kgf – kilogram force - килограмм (кГ ед. силы)
kg/sq.cm – kilogram per square centimetre – атмосфера (e.g. давления)
kV/a-hr – kilovolt ampere-hour - киловольтампер/час
kW – kilowatt - киловатт
KW-hr – kilowatt per hour - киловатт/час (кВт/ч)
lb. – pound - фунт
lit. – litre - литр
lm – lumen - люмен
l.p.– low pressure - низкое давление
l.v. – low voltage - низкое напряжение
m – metre - метр
m – milli - милли-
µ – micro - микро-
mA – milliampere - миллиампер
µA – microampere - микроампер
Mc/s – megacycles per second - мегагерц
µfd – microfarad - микрофарада
µH – microhenry - микрогенри
mi – mile - миля
mm – millimeter - миллиметр
mm Hg (mercury) – миллиметр ртутного столба
No.; Nos – number(s) - номер(а)
N.-m – Newton-meter - ньютон/метр
pc., pcs – piece(s) - штука(и)
pf – picofarad - пикофарада
ph – per hour - в час
p.m. – per minute - в минуту
POS – position - пункт, позиция
ppm – parts per million - частей на миллион
PS – portside - левый борт
p.s.f. – pounds per square foot - фунтов на кв. фут
p.s.i. – pounds per square inch - фунтов на кв. дюйм
Qnty – quantity - количество
Re, re - относительно, касательно
rev/min – revolutions per minute - оборотов в минуту
r.f. – radio frequency - высокая частота, радиочастота
RPM, r.p.m. – revolutions per minute - оборотов в минуту
r.p.s. – revolutions per second - оборотов в секунду
SB – starboard - правый борт
sc. – scale - шкала
sec. – second - секунда
SSB (Spread-Spectrum Broadcasting) - радиовещательная связь с расширением спектра сигналов
St. Std – State Standard - (ГОСТ)
Std – Standard - (ОСТ)
sq - square - квадрат, квадратный
sqcm – square centimetre - квадратный сантиметр
s.w.– specific weight - удельный вес
tf – ton force - тонна сила
tm – ton moment - тонна момент
V – volt - вольт (В)
v.f.– video frequency - видеочастота
vs – versus - против
v.v.– variable voltage - переменное (регулируемое) напряжение
W – watt - ватт
w. g. – wire gauge - проволочный калибр
yd.– yard – ярд
Y/O – *your order* - ваше указание

ПРИЛОЖЕНИЕ В

UNITS OF MEASUREMENT

Linear Measures
Меры длины

Дюйм	inch	in	2.54 cm
Фут	foot	ft (12 in.)	30.48 cm
Ярд	yard	yd (3 ft)	91.44 cm
Миля	mile	mi. (1760 yd)	1609.33 m
Миля морская	nautical mile (knot)	naut. mi. (6080 ft)	1853.18 m

Measures of Weight
Меры веса

Драхма	dram	dr	1.77 g
Унция	ounce	oz (16 dr.)	28.35 g
Фунт	pound	lb. (16 oz)	453.59 g
Стон	stone	st. (14 lb.)	6.35 kg
Квартер	quarter	qr (28 lb.)	12.7 kg
Центнер	hundredweight	hwt (112 lb.)	50.8 kg
Тонна большая	ton	t (20 hwt)	1016.048 kg

Measures of Volume
Меры объема и сыпучих тел

Джил	gill	–	0.14 l
Пинта	pint	pt (4 gills)	0.57 l
Кварта	quart	qt (2 pt)	1.14 l
Галлон	gallon	gal. (4 qt)	4.55 l
Бушель	bushel	bsh. (8 gal.)	36.37 l
Квортер	quarter	qr. (8 bsh).	290.94 l

Square Measures
Меры площади

Кв. дюйм	square inch	sq. in.	6.45 cm^2
Кв. фут	square foot	sq. ft (144 sq. yd)	9.29 dm^2
Кв. ярд	square yard	sq. yd (9 sq. ft)	0.836 m^2
Акр	acre	ac. (4840 sq. yd)	0.4 hectare
Кв. миля	square mile	sq. mi. (640 ac.)	2.59 km^2

ПРИЛОЖЕНИЕ С

Metric Measures

	Metric	
Length	10 millimetres (mm) 100 centimetres 1000 metres	= 1 centimetre (cm) = 1 metre (m) = 1 kilometre
Area	100 square metres (m^2) 100 areas 100 hectares	= 1 are (a) = 1 hectare (ha) = 1 square kilometer (km^2)
Weight	1000 milligrams (mg) 1000 grams 1000 kilograms	= 1 gram (g) = 1 kilogram (kg) = 1 tonne
Capacity	10 millilitres (ml) 1000 centilitres (cl) 10 litres	= 1 centilitre = 1 litre (l) = 1 decalitre (dal)

Non-metric Measures

	Non-metric	
Length	1 inch (in) 12 inches 3feet 220 yards 8 furlongs 1760 yards	— = 1 foot (ft) = 1 yard (yd) = 1 furlong = 1 mile = 1 mile
Area	1 square (sq) inch 144 sq inches 9 sq feet 4840 sq yards 640 acres	— = 1 sq foot = 1 sq yard = 1 acre = 1 sq mile
Weight	437 grains 16 ounces 14 pounds 8 stone 20 hundredweight	= 1 ounce (oz) = 1 pound (lb) = 1 stone (st) = 1 hundredweight (cwt) = 1 ton

Заказ № от «___» _____ 2009 Тираж
Изд-во СевНТУ