

ФЕДЕРАЛЬНОЕ АГЕНТСТВО ВОЗДУШНОГО ТРАНСПОРТА
(РОСАВИАЦИЯ)

ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ
ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ
«МОСКОВСКИЙ ГОСУДАРСТВЕННЫЙ ТЕХНИЧЕСКИЙ
УНИВЕРСИТЕТ ГРАЖДАНСКОЙ АВИАЦИИ» (МГТУ ГА)

Кафедра специальной языковой подготовки

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ПРОФЕССИОНАЛЬНЫЙ АНГЛИЙСКИЙ ЯЗЫК

Учебно-методическое пособие

*для студентов III курса
направлений подготовки 20.03.01 «Техносферная
безопасность», 25.03.01 «Техническая эксплуатация
летательных аппаратов и двигателей», направленность
(профиль) «Безопасность полетов воздушных судов»
очной формы обучения*

Москва
ИД Академии Жуковского
2021

УДК 811.111
ББК Чи (Англ.)
П16

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П16 Профессиональный английский язык [Текст] : учебно-методическое пособие / С.В. Пантюхова, Ж.Л. Михалева. – М.: ИД Академии Жуковского, 2021. – 48 с.

Данное учебно-методическое пособие издается в соответствии с рабочей программой учебной дисциплины «Профессиональный английский язык» по учебному плану для студентов III курса направлений подготовки 20.03.01 «Техносферная безопасность», 25.03.01 «Техническая эксплуатация летательных аппаратов и двигателей», направленность (профиль) «Безопасность полетов воздушных судов» очной формы обучения.

В учебно-методическом пособии представлены аутентичные тексты, лексико-грамматические упражнения, направленные на формирование и проверку навыков работы с текстом, а также навыков общения в профессиональной среде.

Учебно-методическое пособие предназначено для аудиторной и самостоятельной работы студентов.

Рассмотрено и одобрено на заседаниях кафедры 15.03.2021 г. и методических советов 25.03.01 – 30.03.2021 г., 20.03.01 – 20.04.2021 г.

УДК 811.111
ББК Чи (Англ.)

В авторской редакции

Подписано в печать 31.05.2021 г.

Формат 60x84/16 Печ. л. 3 Усл. печ. л. 2,79

Заказ № 785/0519-УМП43 Тираж 50 экз.

Московский государственный технический университет ГА
125993, Москва, Кронштадтский бульвар, д. 20

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PART 1 AVIATION SAFETY

UNIT 1

Aviation safety is a fundamental objective of the International Civil Aviation Organization (ICAO). ICAO is constantly working in close collaboration with the entire air transport community to further improve aviation safety and standards.

Why is Aviation Safety so important?

To keep passengers and flight crew safe while flying safety always comes first. Aviation safety is important because human lives are involved in every operation of aircraft. Safety must be the number one priority for any airline in all aspects of air transportation.

What is Aviation Safety?

Aviation safety is a step towards the prevention of accidents and incidents in the aviation industry. In other words, we can say “Safety is no accident”. In fact, an accident or incident is rarely by accident.

An accident is seldom the direct result of a single failure. Invariably, it is the coming together of various causal factors that stack up sequentially and converge into a single point in time where the last trigger results in the overlap of all failed barriers.

It is usually an instance of a single error or oversight that finds unobstructed passage through a string of absent, ineffective or failed barriers. The idea is to break the link in the chain leading to an undesirable and unsafe outcome.

Importance of Safety in Aviation

Safety is of paramount importance wherever humans are involved. In aviation, safety determines the very existence of the industry. Aviation is a complex business and involves the participation of people in more than one sphere. From the manufacturer, maintenance, ground support, ATC to the flight crew and even passengers every agency plays a role in the safe take off to landing of every flight. This is achieved through an intricate network of procedures that prevent errors and omissions as well as processes that are in place to capture such lapses. People are working around equipment and in conditions that themselves have potential as hazards. This safety entails not only the safe operation of aircraft but also the safety and well-being of personnel involved behind the scenes.

VOCABULARY EXERCISERS

Ex. 1. Memorize the following words and word combinations:

Aviation safety, air transport community, operation of aircraft, airline, air transportation, prevention of accidents and incidents, failure, causal factors,

undesirable and unsafe outcome, manufacture, maintenance, ground support, Air Traffic Control (ATC), flight crew, take off, landing, equipment, hazard.

Ex. 2. Find in the text English equivalents to the following words and word combinations:

Основная цель, тесное сотрудничество, чтобы обеспечить безопасность пассажиров и экипажа, случайно, прямой результат единичного сбоя, неизменно, сочетание различных причинных факторов, наложение друг на друга всех отказавших защитных барьеров, единственная ошибка или недосмотр, беспрепятственный проход, само существование отрасли, сложная сеть процедур, предотвращать ошибки и упущения, фиксировать промахи, являться потенциально опасным, влечь за собой безопасную эксплуатацию самолета.

Ex. 3. Find in the text the synonyms to the following words:

Goal, cooperation, airplane, by chance, malfunction, combination of factors, an example, mistake, producer, apparatus, risk, staff.

Ex. 4. Find in the text the antonyms to the following words:

Danger, to make worse, unimportant, often, numerous, the first, desirable, ground crew, take off, in front of, effective, present.

Ex. 5. Form nouns from the following verbs:

To collaborate, to transport, to improve, to operate, to prevent, to fail, to pass, to determine, to exist, to participate, to manufacture, to maintain, to land, to equip.

Ex. 6. Match the parts 1-5 with the parts a-e to make meaningful sentences:

- 1) ICAO is constantly working in close collaboration with...
- 2) Aviation safety is important because human lives are involved in...
- 3) Aviation safety is a step towards the prevention of accidents and incidents in...
- 4) An accident is seldom the direct result of...
- 5) Aviation is a complex business and involves the participation of...
 - a)...the aviation industry.
 - b)...people in more than one sphere.
 - c)...the entire air transport community.
 - d)...a single failure.
 - e)...every operation of aircraft.

Ex. 7. Make up sentences using the following words:

- 1) the industry/ safety/ in/ the very/ determines/ of/ existence/ aviation.
- 2) themselves/ people/ hazards/ working/ in/ have/ conditions/ are/ as/ that/ potential/ have.
- 3) the number one/ airline/ safety/ for/ must/ priority/ any/ be.

Ex. 8. Fill in the gaps with the prepositions:

- 1) All members ... air transport community work ... close collaboration ... each other.
- 2) Safety is a fundamental objective ... any airline ... all aspects ... air transportation.
- 3) Safety is a step ... prevention ... accidents and incidents ... any industry.
- 4) ... fact, accidents rarely happen ... accident.
- 5) Very often a single error finds unobstructed passage ... a string ... absent, ineffective or failed barriers.
- 6) Everybody (... the manufacture ... the flight crew) plays a role ... the safe take landing ... every flight.
- 7) Aviation safety is achieved ... an intricate network ... procedures.
- 8) People work ... equipment and ... hazardous conditions.
- 9) Safety also entails wellbeing ... personnel involved ... the scene.

Ex. 9. Fill in the gaps with the proper words:

- 1) ICAO is constantly trying to i... aviation safety.
- 2) Safety always comes first to keep p... and f... c... safe while flying.
- 3) P... of accidents and incidents is the top p... for aviation safety.
- 4) Safety is no a... .
- 5) As a rule, an a... is the result of more than one f... .
- 6) It is the coming together of various c... f... .
- 7) It's necessary to b... the link in the chain leading to unsafe o... .
- 8) Aviation i... the participation of p... in more than one sphere.
- 9) Safety is achieved through an intricate n... of procedures that prevent e... and o... .
- 10) Safety also means processes in place to c... such lapses.

SPEECH EXERCISES**Ex. 1. Answer the questions:**

- 1) What is a fundamental objective of ICAO?
- 2) What is ICAO constantly doing?
- 3) Why does safety always come first?
- 4) How often do accidents or incidents happen by accident?
- 5) Is an accident usually the direct result of a single failure?
- 6) An accident is the coming together of various casual factors, isn't it?
- 7) Why does safety determine the very existence of aviation industry?
- 8) What sort of business is aviation? Why?
- 9) How is aviation safety achieved?
- 10) What does aviation safety entail?

Ex. 2. Decide whether the following statements are true or false:

- 1) An accident or incident often happens accidentally.
- 2) An accident is usually the result of some failures.
- 3) The aim is to break the link in the chain leading to an undesirable and unsafe outcome.
- 4) Passengers don't play a role in the safe take off to landing of every flight.
- 5) Aviation safety is achieved through a simple network of procedures.

Ex. 3. Make up all possible questions to the following sentences:

- 1) Aviation safety means the state of an aviation system when risks are reduced to an acceptable level.
- 2) Aviation safety should not be confused with aviation security.

Ex. 4. Sum up the content of the text in 8-10 sentences.

Ex. 5. Discuss the state of aviation safety a) in our country; b) in the world.

GRAMMAR EXERCISES

Ex. 1. Match English sentences with Russian ones (for example 1-f):

- | | |
|--|--|
| 1 – f The students <i>will write</i> a test ... | a. Студенты пишут тест (сейчас). |
| 2 – The students <i>have written</i> a test ... | b. Студенты напишут тест (до конца урока). |
| 3 – The students <i>were writing</i> a test ... | c. Студенты писали тест (вчера). |
| 4 – The students <i>have been writing</i> a test ... | d. Студенты написали тест (уже). |
| 5 – The students <i>will be writing</i> a test ... | e. Студенты будут писать тест (через час). |
| 6 – The students <i>write</i> a test ... | f. Студенты напишут тест (завтра). |
| 7 – The students <i>will have written</i> a test ... | g. Студенты писали тест (в 9:00 утра). |
| 8 – The students <i>wrote</i> a test ... | h. Студенты пишут тест (часто). |
| 9 – The students <i>are writing</i> a test ... | i. Студенты пишут тест (с 9:00 утра). |

Ex. 2. Determine the tense of the predicate and match the number with the letter (for example 1-b):

- | | |
|--|------------------------------|
| 1 – b The students <i>will have written</i> a test ... | a. Future Simple |
| 2 – The students <i>will be writing</i> a test ... | b. Future Perfect |
| 3 – The students <i>write</i> a test ... | c. Future Perfect Continuous |
| 4 – The students <i>wrote</i> a test ... | d. Future Continuous |
| 5 – The students <i>will write</i> a test ... | e. Present Simple |
| 6 – The students <i>were writing</i> a test ... | f. Present Perfect |

- | | |
|---|-------------------------------|
| 7 – The students <i>had written</i> a test ... | g. Present Perfect Continuous |
| 8 – The students <i>have written</i> a test ... | h. Present Continuous |
| 9 – The students <i>have been writing</i>
a test ... | i. Past Simple |
| 10 – The students <i>are writing</i> a test ... | j. Past Perfect |
| 11 – The students <i>had been writing</i>
a test ... | k. Past Perfect Continuous |
| 12 – The students <i>will have been writing</i>
a test ... | l. Past Continuous |

Ex. 3. Determine the tense of every predicate and translate the sentences into Russian:

1. How time *flies*! At this time yesterday we *were swimming* in the Black Sea. 2. Her brothers always *tell* the truth, she sometimes *lies*. 3. I *haven't heard* about him since 1995. 4. You *will never know* English well if you *don't work* hard. 5. That day Tom *came* home early from work. 6. Where *were you hurrying* when I *met* you? 7. Tom *has just returned* from the USA. 8. Alice *is talking* on the phone. She *has been talking* for half an hour already. 9. She *understood* the text after she *had read* it a second time. 10. She *phoned* and *called* a taxi. 11. I *am* not sure I *will have translated* the text by Friday. 12. My teacher *said* it was a very good story. 13. She *visits* her doctor every month. 14. Nick *said* he *had seen* a ghost. 15. *Will they be meeting* you at the station? 16. Yesterday I *found* the book I *had been looking* for so long. 17. Perhaps he *will come* next week. 18. They *will have done* everything by Sunday. 19. He *will be preparing* for the exam all day tomorrow. 20. It *will be* wonderful, if he *wins* the competition. 21. No one *has lived* in that house for many years. 22. When Dave *entered* the room, Sally *was reading* a letter.

Ex. 4. Use the verbs below to complete the questions:

does have must do will did are

- 1) When ... you start to learn English?
- 2) How long ... you been studying English?
- 3) How ... you try to improve your English outside class?
- 4) What language training ... you had already?
- 5) What ... you find most difficult about English?
- 6) How often ... you use English in your work?
- 7) How much support ... your employer give you?
- 8) Why ... you studying English?
- 9) What level of English ... you be happy with?
- 10) What level of English ... you have for your job?

UNIT 2

AVIATION SAFETY HAZARDS

Aviation safety hazards include foreign object debris, misleading information and lack of information, lightning, ice and snow, wind shear, engine failure, structural failure, fire, bird strike, human factors, ground damage, volcanic ash, terrorism, military actions, etc.

Foreign object debris

Foreign object debris (FOD) includes items left in the aircraft structure during manufacture/repairs, debris on the runway and solids encountered in flight (e.g. hail and dust). Such items can damage engines and other parts of the aircraft. Air France Flight 4590 crashed after hitting a part that had fallen from another aircraft.

Misleading information and lack of information

A pilot misinformed by a printed document (manual, map, etc.), reacting to a faulty instrument or indicator (in the cockpit or on the ground), or following inaccurate instructions or information from flight or ground control can lose spatial orientation, or make another mistake, and consequently lead to accidents or near misses.

Lightning

Boeing studies showed that airliners are struck by lightning twice per year on average; aircraft withstand typical lightning strikes without damage. The dangers of more powerful positive lightning were not understood until the destruction of a glider in 1999. It has since been suggested that positive lightning might have caused the crash of Pan Am Flight 214 in 1963. At that time, aircraft were not designed to withstand such strikes because their existence was unknown. The 1985 standard in force in the US at the time of the glider crash, Advisory Circular AC 20-53A, was replaced by Advisory Circular AC 20-53B in 2006. However, it is unclear whether adequate protection against positive lightning was incorporated.

The effects of typical lightning on traditional metal-covered aircraft are well understood and serious damage from a lightning strike on an airplane is rare. The Boeing 787 Dreamliner with carbon-fiber-reinforced polymer exterior received no damage from a lightning strike during testing.

VOCABULARY EXERCISERS

Ex. 1. Memorize the following words and word combinations:

Aviation safety hazards, foreign object debris, aircraft structure, runway, engine, misleading information, faulty instrument, special orientation, lightning, damage, metal-covered aircraft.

Ex. 2. Find in the text English equivalents to the following words and word combinations:

Обломки посторонних предметов, во время изготовления или ремонта, столкнуться в полете, град, пыль, повредить двигатели, разбиться,

дезинформировать, неисправный прибор или индикатор, потерять пространственную ориентацию, допустить ошибку, потенциально опасные происшествия без последствий, получить удар молнии, выдерживать без повреждений, положительная молния, быть причиной крушения, самолет с металлическим покрытием, армированный углеродным волокном полимер, во время испытаний.

Ex. 3. Form phrases according to the text:

- | | |
|------------------|----------------------------------|
| 1) without | a) a mistake |
| 2) aircraft | b) lightning strikes |
| 3) designed | c) instructions |
| 4) damage from | d) parts of the aircraft |
| 5) to lead | e) spatial orientation |
| 6) to cause | f) to accidents |
| 7) to react | g) by lightning |
| 8) to be struck | h) to an instrument or indicator |
| 9) to lose | i) damage |
| 10) to make | j) a crash |
| 11) to withstand | k) structure |
| 12) to follow | l) lightning strike |
| 13) to damage | m) to withstand |

Ex. 4. Make up words from the following letters:

Zdarahs, bsdrei, ynwura, eegnni, tolip, icnacdte, dernag, scrha, erwateh, fcaitrar.

Ex. 5. Complete the following sentences:

- 1) Foreign object debris can damage
- 2) A pilot might follow inaccurate instructions or information from
- 3) Airliners are known to be struck by lightning
- 4) Aircraft withstand typical lightning strikes
- 5) Positive lightning might have caused the crash
- 6) At that time the existence of positive lightning strikes
- 7) The effects of typical lightning on traditional metal-covered aircraft are
- 8) Serious damage from a lightning strike on an airplane is
- 9) The Boeing 787 Dreamliner received no damage from

Ex. 6. Fill in the gaps with the prepositions:

- 1) The plane wasn't damaged ... testing.
- 2) Serious damage ... a lightning strike ... an airplane is rare.
- 3) Adequate protection ... positive lightning was incorporated.
- 4) ... that time airplanes were not designed to withstand such strikes.
- 5) The crash ... Pan Am Flight 214 happened ... 1963.
- 6) It's known that airliners are struck ... lightning twice ... year ... average.
- 7) A pilot can be misinformed ... a printed document, faulty instrument or instructions ... flight or ground control.

- 8) Air France Flight 4590 crashed ... hitting a part ... another aircraft.
- 9) FOD includes items left ... the aircraft structure ... manufacture or repairs.

Ex. 7. Find an extra word in each sentence:

- 1) FOD can be damage engines and other parts of the aircraft.
- 2) The plane crashed after hitting a part that had been fallen from another aircraft.
- 3) A pilot can to lose spatial orientation in bad weather conditions.
- 4) Studies show that such incidents happen 10-15 times per year on the average.
- 5) Positive lightning might to have caused the crash of Pan Am Flight 214 in 1963.
- 6) Nowadays the effects of typical lightning are well being understood.
- 7) The Boeing 787 Dreamliner didn't received no damage from a lightning strike during testing.

Ex. 8. Fill in the gaps with the words and word combinations given below:

an incident, quite rare, hit, an air traffic controller, means, clear, well studied, defective, production, as a rule, the tragedy

- 1) FOD ... items left in the aircraft structure during ... or repairs.
- 2) Such items can ... engines or other parts of an airplane.
- 3) A pilot can be misinformed by a ... instrument or indicator.
- 4) A pilot can get inaccurate information from
- 5) Such mistake can lead to
- 6) ... aircraft withstand typical lightning strike without damage.
- 7) The dangers of more powerful positive lightning were not ... until the destruction of a glider in 1999.
- 8) Positive lightning might have caused ... with Pan Am Flight 214 in 1963.
- 9) The effects of typical lightning on traditional metal-covered aircraft are
- 10) Serious damage from a lightning strike on an airplane is

SPEECH EXERCISES

Ex. 1. Answer the questions:

- 1) What aviation safety hazards do you know?
- 2) Which of them is the most dangerous?
- 3) What does FOD stand for?
- 4) What does FOD include?
- 5) What happened to Air France Flight 4590?
- 6) Why can a pilot lose spatial orientation?
- 7) What did Boeing studies show?
- 8) What became clear after the destruction of a glider in 1999?
- 9) What might have caused the crash of Pan Am Flight 214 in 1963?
- 10) Serious damage from a lightning strike on modern airplanes isn't rare, is it?

Ex. 2. Make up questions to the words in bold:

- 1) Debris on the runway and solids encountered in flight are very dangerous **for aircraft**.

- 2) **Faulty instrument or indicator** in the cockpit or on the ground can lead to **accidents**. (2 questions)
- 3) Modern aircraft withstand typical lightning strikes **without damage**.

Ex. 3. Sum up the content of the text in 8-10 sentences.

Ex. 4. Discuss the accidents which were caused by FOD, misleading information or lack of information, lightning.

GRAMMAR EXERCISES

Ex. 1. Match English sentences with Russian ones:

1. A new house is being built in our street.
2. A new house is built in our street.
3. A new house has been built in our street.
4. A new house was built in our street.
5. A new house will be built in our street.
6. A new house was being built in our street.
 - a) На нашей улице построят новый дом.
 - b) На нашей улице строится новый дом.
 - c) На нашей улице строили новый дом.
 - d) На нашей улице построили новый дом.
 - e) На нашей улице строился новый дом.
 - f) На нашей улице построен новый дом.

Ex. 2. Which sentences can be transformed into the Passive Voice? Make all possible transformations:

1. They didn't ask her name.
2. Michael saw Mary in the park.
3. Has anyone answered your question?
4. They danced all night.
5. On Sunday evening we all met at my friend's.
6. Someone told us a funny story yesterday.
7. You can't park your car in the street before this office.
8. This kind of flowers doesn't bloom very often.
9. His parents have brought him up to be polite.
10. The plane from Los Angeles was several hours late.
11. The fire has caused considerable damage.
12. My shoes don't fit me.
13. People must obey the law.
14. He was having a bath.
15. A famous designer will decorate the hall.

Ex. 3. Determine the tense and the voice of every predicate and translate the sentences into Russian:

1. The students *were given* a lot of work to do last month.
2. She *was often spoken about*.
3. I *was told* a very interesting story.
4. The way to the college *will be shown* to you by any student.
5. They *have been discussing* this question for the whole hour. This question *is being discussed* at the meeting.
6. They *were listening* to music when I *entered* the room. When I *entered* the room the lecturer *was being listened to* with great attention.
7. She *has just written* a letter. The letter *has just been written* by her.
8. His

parents *have bought* a new TV set this week. A new TV set *has been bought* by them this week. 9. She *showed* me the text which her brother *had translated*. She *showed* me the text which *had been translated* by her brother. 10. He *will have completed* his experiment by the end of the month. We *know* that the experiment *will have been completed* by the end of the year. 11. He *was interrupted* by the ringing of the telephone. 12. He felt with satisfaction that he *was being stared* at. 13. She saw at once that nothing *had been touched*.

Ex. 4. Translate the Passive constructions with prepositions into Russian:

1. The article *has been* often *referred to*. 2. The lecturer *was listened to* with great attention. 3. The date of the visit *was agreed upon* at last. 4. In this hospital the patients *are well looked after* and *provided with* all the necessary medicines. 5. Their persistence in work *was well thought of*. 6. New taxation laws *were widely commented on* in press. 7. The problem of unemployment *is only briefly touched upon* in the paper. 8. Several changes in the factory management *were brought about* by important economic factors. 9. When they tried to put forward their proposal, they *were only laughed at*. 10. As soon as the fire broke out the firemen *were sent for*. 11. A radical change in the payment practices *was insisted upon* by the trade unions. 12. His skill and experience *can be relied upon*. 13. Differences in education *must be taken into account* when considering the job applications. 14. The cat *was looked for* everywhere. 15. Our arguments *were listened to* with great attention.

Ex. 5. Choose the correct form of the predicate:

1. The contract ... at the board meeting now.
a) *is discussed*; b) *is being discussed*; c) *was discussed*; d) *was being discussed*.
2. Wait a minute! The document ... by the secretary at the moment.
a) *is typed*; b) *has been typed*; c) *was typed*; d) *is being typed*.
3. The papers ... by the managing director yet. He is on business trip.
a) *weren't signed*; b) *aren't signed*; c) *haven't been signed*; d) *weren't being signed*.
4. She ... the Head of the Information Systems Department two months ago.
a) *is appointed*; b) *is being appointed*; c) *was appointed*; d) *has been appointed*.
5. Recently a new generation of TV sets ... in Japan.
a) *is being launched*; b) *has been launched*; c) *was being launched*; d) *had been launched*.
6. At present our company ...
a) *has been reorganized*; b) *is being reorganized*; c) *has reorganized*; d) *is reorganized*.
7. The mail ... yet.
a) *hasn't been received*; b) *isn't being received*; c) *wasn't received*; d) *isn't received*.
8. From Monday English classes ... in the Training Centre.
a) *are held*; b) *are being held*; c) *will be held*; d) *have been held*.
9. We ... to send the documents by Friday.

a) were asked; b) were being asked; c) have been asked; d) had been asked.

10. At last a new government ... after a long governmental crisis.

a) is formed; b) is being formed; c) was formed; d) has been formed.

11. My car ... at the moment. Sorry, I can't give you a lift to the station.

a) is serviced; b) is being serviced; c) has been serviced; d) has being serviced.

12. All teaching materials ... after the classes start.

a) will have been provided; b) will be provided; c) have been provided; d) are provided.

SUPPLEMENTARY READING

Effects of weather

Except perhaps for local or short flights, a pilot, before taking off, obtains a weather forecast, as weather conditions affect aircraft in flight. The meteorologist prepares a weather chart, which shows the current weather conditions over the whole country. This chart shows the areas of low pressure, to which the pilot should pay particular attention, the areas of high pressure, where precipitation is falling, and all other weather conditions across the country. From this weather map, the forecaster can advise pilots of the weather conditions they can expect to encounter during their flights. A high-pressure area usually means good weather, while a low-pressure area usually involves one or more fronts producing clouds, thunderstorm with lightning strikes, hail and statics, precipitation and turbulence over many hundreds of miles. Interference of stable air masses can produce clear air turbulence. From the chart the pilot will decide which route to fly and when. A pilot may decide to postpone the flight in thick fog or poor visibility. A pilot needs to know wind direction and speed. The headwind may delay the arrival of flights and is to be avoided. A tailwind can be of great advantage as it increases the ground speed and results in reduction of fuel consumption.

Ex. 1. Form the phrases according to the text:

A	B
1) local	a. attention
2) clear air	b. consumption
3) weather	c. weather conditions
4) current	d. advantage
5) pay	e. fronts
6) to encounter	f. flight
7) a low-pressure area involves	g. charts
8) to postpone	h. thunderstorm with lightning strikes
9) to be of great	i. turbulence
10) fuel	j. flights

Ex. 2. Make nouns from the following words:

Meteorology; forecast; decide; know; arrive; pay; interfere; avoid.

Ex. 3. Match the words below with their definitions:

postpone, produce, consumption, local, weather forecast, increase, involve, weather conditions, advantage, decide

- 1) only a short distance away from a person, thing or place;
- 2) a description of what the weather will probably be like in the near future, provided by radio, television, or newspapers;
- 3) the weather at a particular time, especially when considering how this will affect an event or activity that has been planned, such as journey or flight;
- 4) to make someone take part in something, especially by encouraging them to do this;
- 5) to make a choice that you are going to do something;
- 6) to arrange to do something at a later time, especially because it is not possible to do it at the time that was planned;
- 7) something that helps you to be in a better position than other people, more likely to succeed;
- 8) the amount of something that is used, such as food, gas, electricity, or water;
- 9) to make something;
- 10) to become larger in number, amount, cost etc.

Ex. 4. Retell the text using word combinations:

1. - local or short flights - to obtain a weather forecast – weather conditions – to affect aircraft in flight;
2. – to prepare weather chart – to show the current weather conditions;
3. – to show the areas of low pressure – to pay particular attention – areas of high pressure – precipitation – weather conditions across the country;
4. – the forecaster – to advice pilots – to encounter during the flight;
5. – a high-pressure area – to mean – good weather – a low-pressure area – to involve fronts – to produce clouds, thunderstorm, hail and statics;
6. – interference of stable air masses – to produce – clear air turbulence;
7. – the chart – to decide – which route to fly and when;
8. – to decide – to postpone the flight;
9. – to know wind direction and speed;
10. – the headwind – to delay – the arrival;
11. – a tailwind – to be of great advantage – to increase the ground speed – to result – reduction of fuel consumption;

Ex. 5. Give your examples of bad weather conditions and how they may affect the flight of aircraft.

UNIT 3
AVIATION SAFETY HAZARDS
 (CONTINUATION)

Ice and snow

Ice and snow can be major factors in airline accidents. In 2005, Southwest Airlines Flight 1248 slid off the end of a runway after landing in heavy snow conditions, killing one child on the ground.

Even a small amount of icing or coarse frost can greatly impair the ability of a wing to develop adequate lift, that is why regulations prohibit ice, snow or even frost on the wings or tail, prior to take-off. Air Florida Flight 90 crashed on take-off in 1982, as a result of ice/snow on its wings.

An accumulation of ice during flight can be catastrophic, as evidenced by the loss of control and subsequent crashes of American Eagle Flight 4184 in 1994, and Comair Flight 3272 in 1997. Both aircraft were turboprop airliners, with straight wings, which tend to be more susceptible to inflight ice accumulation, than are swept-wing jet airliners.

Airlines and airports ensure that aircraft are properly de-iced before take-off whenever the weather involves icing conditions. Modern airliners are designed to prevent ice buildup on wings, engines, and tails (empennage) by either routing heated air from jet engines through the leading edges of the wing, and inlets, or on slower aircraft, by use of inflatable rubber "boots" that expand to break off any accumulated ice.

Airline flight plans require airline dispatch offices to monitor the progress of weather along the routes of their flights, helping the pilots to avoid the worst of inflight icing conditions. Aircraft can also be equipped with an ice detector in order to warn pilots to leave unexpected ice accumulation areas, before the situation becomes critical. Pitot tubes in modern airplanes and helicopters have been provided with the function of "Pitot Heating" to prevent accidents like Air France Flight 447 caused by the pitot tube freezing and giving false readings.

VOCABULARY EXERCISERS

Ex. 1. Memorize the following words and word combinations:

Major factor, heavy snow conditions, to develop lift, accumulation of ice, loss of control, turboprop airliner, straight wing airliner, swept wing jet airliner, de-icing, ice buildup, the progress of weather, to be equipped with.

Ex. 2. Find in the text English equivalents to the following words and word combinations:

Главные факторы авиакатастроф, посадка в условиях сильного снегопада, обледенение, иней, ухудшить способность, запрещать, разбиться на взлете, потеря управления, быть восприимчивым к образованию льда в полете, быть

очищенным ото льда, препятствовать образованию льда, крыло, двигатель, хвостовое оперение, направить теплый воздух, передняя кромка крыла, надувные резиновые чехлы, погода по маршруту, быть оборудованным датчиком льда, трубка Пито.

Ex. 3. Match the synonyms in columns A and B:

- | A | B |
|-----------------|---------------|
| 1) factor | a) plane |
| 2) accident | b) to produce |
| 3) to develop | c) to control |
| 4) tail | d) warm |
| 5) accumulation | e) cause |
| 6) aircraft | f) buildup |
| 7) to route | g) sensor |
| 8) heated | h) crash |
| 9) to monitor | i) empennage |
| 10) detector | j) to direct |

Ex. 4. Match the antonyms in columns A and B:

- | A | B |
|-----------------|---------------|
| 1) major | a) breaking |
| 2) landing | b) minor |
| 3) lift | c) disability |
| 4) to prohibit | d) to enter |
| 5) accumulation | e) take-off |
| 6) modern | f) true |
| 7) the worst | g) to allow |
| 8) to leave | h) to improve |
| 9) false | i) obsolete |
| 10) to impair | j) weight |
| 11) ability | k) the best |

Ex. 5. Match the words below with their definitions:

weather, ice, snow, frost, de-icing, factor, accident, crash

- 1) water which has frozen to a solid as a result of reaching a very low temperature;
- 2) a white powdery substance formed on outside surfaces when the temperature of the air is below freezing point;
- 3) a violent vehicle accident;
- 4) water in the air which has frozen and falls in the form of soft white flakes in cold weather;
- 5) something unpleasant or damaging that happens unexpectedly or by chance;

- 6) any of the forces, conditions or influences that act with others to bring about a result;
- 7) making free of ice;
- 8) the condition of wind, temperature, rain, sunshine, snow etc., at a certain time or over a period of time.

Ex. 6. Make up definitions for the following words:

airliner, engine, wing, detector, lift

Ex. 7. Fill in the gaps with the appropriate word or word combination (a-u):

De-icing is a very important process for the safety of flight to (1) ... with the (2) ... of altitudes and weather. Most de-icing (3) ... are performed in so-called (4) ... areas, located near the RW ends. A (5) ... base for de-icing fluids on the RW end guarantees (6) ... refueling of the vehicles. Aircraft are only guided to the (7) ... by ATC if subsequent take-off is (8) ... , and de-icing treatments are (9) ... with engines running. This ensures that (10) ... are minimized, as aircraft take off only a few minutes after (11) As a (12) ... the probability of delays is (13) All types of fluids are (14) ... , cleaned by mechanical and (15) ... means, (16) ... and reformulated. Up to 60 % of the used fluids is reclaimed by the aircraft de-icing system. The positive (17) ... effects of this method are evident. De-icing operators are part of a unique network – airlines, ATC, winter service and other (18) ... are integrated in the development and control of processes. De-icing movements areas and aircraft de-icing are (19) ... ; information is (20) ... in line with requirements. This leads to (21) ... with a high take-off frequency even under adverse weather conditions.

- | | | | |
|-------------------------------|------------------------------|-------------------|--------------|
| a. evaporated | g. safer aviation operations | m. quick | s. de-icing |
| b. performed | h. treatments | n. ecological | t. remote |
| c. airport service facilities | | | |
| | i. harmonized | o. supply | u. confirmed |
| d. holdover times | j. collected | p. distributed | |
| e. de-icing areas | k. chemical | q. adverse effect | |
| f. consequence | l. cope | r. minimized | |

SPEECH EXERCISES

Ex. 1. Answer the questions:

- 1) What happened to Southwest Airline Flight 1248?
- 2) Why do regulations prohibit ice, snow and even frost on the wings or tail prior to take-off?
- 3) When and why did Air Florida Flight 90 crash?
- 4) What aircraft are more susceptible to inflight ice accumulation?

- 5) What must airlines and airports ensure when the weather involves icing conditions?
- 6) How do modern airliners prevent ice buildup on wings, engines and tails?
- 7) What do airline flight plans require?
- 8) What can aircraft be equipped with?
- 9) What have Pitot tubes in modern airplanes and helicopters been provided with?
- 10) What was the accident with Air France Flight 447 caused by?

Ex. 2. Decide whether the following statements are true or false:

- 1) Ice and snow are never major factors in airline accidents.
- 2) Small amount of icing or coarse frost can't impair the ability of a wing to develop adequate lift.
- 3) Regulations prohibit ice, snow and even frost on the wings or tail prior to take-off.
- 4) Air Florida Flight 90 crashed on landing in 1982, as a result of ice/snow on its wings.
- 5) An accumulation of ice during flight can't be catastrophic.
- 6) Straight wing turboprop airliners are more susceptible to inflight ice accumulation.
- 7) Dispatch offices should monitor the progress of weather along the routes of their flights.
- 8) Air France Flight 447 accident was caused by engine failure.

Ex. 3. Make up questions to the words in bold:

- 1) The airliner slid off the end of a runway **after landing in heavy snow conditions**. (2 questions)
- 2) The crashed aircraft was **a turbojet airliner** with straight wings.
- 3) Aircraft can also be equipped with an ice detector **in order to warn pilots** to leave unexpected ice accumulation areas.
- 4) **Air France Flight 447 accident** was caused by the Pitot tube freezing and giving false readings.

Ex. 4. Find information about the crashes of American Eagle Flight 4184 in 1994 and Comair Flight 3272 in 1997 and describe them in details:

Ex. 5. Retell the text about aircraft de-icing using the word combinations:

1. - de-icing - important process - the safety of flight - to cope with the adverse effect;
2. -most de-icing treatments - to perform - remote areas - near the RW ends;
3. -a supply base - de-icing fluids – to guarantee quick refueling of the vehicles;
4. -aircraft - to guide to the de-icing areas - to confirm subsequent take-off - de-icing treatments - to perform - with engines running;
5. - to minimize holdover times - aircraft take off only a few minutes after de-icing;

6. - to minimize the probability of delays;
7. - to collect fluids - to clean by mechanical and chemical means, evaporate and reformulate;
8. - to reclaim fluids - the aircraft de-icing system;
9. - the positive ecological effects - to be evident;
10. - to be part of a unique network - airlines, ATC, winter service and other airport service facilities - to integrate in the development and control of processes;
11. - de-icing movements areas and aircraft de-icing - to be harmonized; information - to be distributed in line with requirements;
12. - safer aviation operations - a high take-off frequency - adverse weather conditions.

GRAMMAR EXERCISES

Ex. 1. Translate the following sentences paying attention to the Infinitive:

1. To construct an experiment of this kind seems nearly impossible. 2. This does, to be sure, simplify the measurements somewhat. 3. We attempted to carry out this investigation. 4. To perform this work one must have all necessary equipment. 5. With these conditions there are also opposing factors to be considered. 6. It is too urgent a matter to be postponed. 7. Some molecules are large enough to be seen on the electron microscope. 8. Thomas was the first to focus attention on this type of reaction. 9. Our purpose here is to attempt to give an answer to the unsolved problem outlined at the outset. 10. The important thing is to understand what you are doing, rather than to get the right answer. 11. This correspondence dealt with books published or to be published. 12. A small computer company announced a computer small enough to set on a desktop and powerful enough to support high level language programming. 13. To have included all these works in this preliminary paper would have been too great and too difficult task. 14. He felt that the only thing to do was to study their methods and ideas. 15. For him, however, obstacles existed only to be overcome. 16. And to conclude, he is to be highly imaginative too. 17. To solve the problem would justify all the costs. 18. There is a tendency to act like an expert when being interviewed, and experts do not like to be asked questions they cannot answer. 19. You are welcome to adopt or adapt my rules as you see fit.

Ex. 2. Translate the following sentences paying attention to the Continuous and Perfect Infinitive forms:

1. He was proud *to have helped* his friends. 2. As a writer he wanted *to be read* and not *to be forgotten*. 3. I am sorry *to have kept* you waiting. 4. We know many human activities *to have contributed* to scientific inventions. 5. Mechanization is *to be distinguished* from primitive tool using. 6. He seems *to have been working* at this problem ever since he came here. 7. I remember *to have seen* your sister before. 8. The problem *to be studied* can be simplified by the use of controlled experimental conditions. 9. *To produce* this effect, it is actually much simpler to use alternating current. 10. The woman pretended *to be reading*. 11. She was sorry *to have missed* the

beginning of the performance. 12. They are supposed *to be working* at this problem too. 13. I am glad *to have been told* the news in time. 14. This book is *to be read* during the holidays.

Ex. 3. Use the Infinitive in brackets in Passive forms:

The model: Teachers like (to listen to) with great attention. – Teachers like to be listened to with great attention.

1. My friend asks (to send) to a business trip. 2. After holidays students don't want (to ask) at their lessons. 3. Nobody likes (to punish). 4. Children like (to tell) about heroic deeds. 5. He doesn't want (to laugh) at. 6. He expected (to help) by his friends. 7. The writer wanted (to read) and not (to forget). 8. I hate (to stop) by the traffic police when I have little time. 9. This problem will (to discuss) at our next meeting. 10. Books must (to return) to the library in time.

UNIT 4
AVIATION SAFETY HAZARDS
(CONTINUATION)

Ground damage

Aircraft are often victims of damage caused by ground equipment at the airport. In the act of servicing the aircraft between flights a great deal of ground equipment must operate in close proximity to the fuselage and wings. Occasionally the aircraft gets bumped or worse. Damage may be in the form of simple scratches in the paint or small dents in the skin. However, because aircraft structures (including the outer skin) play such a critical role in the safe operation of a flight, all damage is inspected, measured and possibly tested to ensure that any damage is within safe tolerances. A dent that may look no worse than common parking damage to an automobile can be serious enough to ground an airplane until a repair can be made.

An example of the seriousness of this problem was the December 26, 2005 depressurization incident on Alaska Airlines MD-83 aircraft. During ground services a ramp worker hit the side of the aircraft with a piece of ground equipment. This created a crease in the metal skin. This damage was not reported and the plane departed. Climbing through 26,000 feet the crease in the metal gave way due to the growing difference in pressure between the inside of the aircraft and the outside air. The cabin depressurized with a bang, frightening all aboard and necessitating a rapid descent back to denser (breathable) air and an emergency landing. The three pieces of ground equipment that most frequently damage aircraft are the passenger boarding bridge, catering trucks, and cargo "beltloaders". However, any other equipment found on an airport ramp can damage an aircraft through careless use, high winds, technical failure, and so on.

The generic industry colloquial term for this damage is "ramp rash."

VOCABULARY EXERCISERS

Ex. 1. Memorize the following words and word combinations:

Ground damage, ground equipment, skin, safe operation of a flight, to bump, dent, scratch, within safe tolerances, to ground an airplane, pressure, depressurization, ramp, to depart, to climb, cabin, descent, emergency landing, boarding bridge, catering truck, cargo “beltloader”.

Ex. 2. Find in the text English equivalents to the following words and word combinations:

Повреждение, нанесенное наземным оборудованием, обслуживание воздушного судна между рейсами, работать в непосредственной близости, царапины на краске, вмятины на обшивке, решающая роль в безопасном выполнении полета, повреждение находится в пределах безопасных допусков, задержать самолет на земле, ремонт, инцидент с разгерметизацией, металлическая обшивка, о повреждении не было сообщено, разница давления, салон разгерметизировался, быстрое снижение, аварийная посадка, неаккуратное использование.

Ex. 3. Match the opposites (antonyms) in columns A and B:

A	B
1) often, frequently	a) difficult
2) close	b) outside
3) simple	c) light wind
4) safe	d) slow
5) worse	e) seldom
6) inside	f) outer
7) careless	g) dangerous
8) high wind	h) far
9) rapid	i) careful
10) inner	j) better

Ex. 4. Find the words in the text corresponding to the following definitions:

- 1) nearness in space or time;
- 2) the outer layer of an aircraft;
- 3) harm that is caused to something;
- 4) an allowable variation in something, which can be measured;
- 5) to prohibit an aircraft or member of an aircraft from flying;
- 6) an action designed to return something to good condition after damage;
- 7) a loss especially sudden, of cabin pressure;
- 8) a truck that is used to deliver food to the aircraft;
- 9) a bridge used by passengers and crew to get on board an aircraft;
- 10) an aerodrome vehicle used for loading cargo or baggage into the aircraft.

Ex. 5. Make up definitions for the following words:

airport, aircraft, departure, climb, descent

Ex. 6. Fill in the gaps with the proper words:

Aircraft are often victims of 1) _____ caused by ground equipment at the airport. During servicing the aircraft ground equipment must operate in close 2) _____ to the fuselage and wings. Damage may be in the form of simple 3) _____ in the paint or small 4) _____ in the 5) _____. All damage is inspected, measured and possibly tested to ensure that any damage is within safe 6) _____. A dent can 7) _____ an airplane until a 8) _____ will be made. In 2005 9) _____ incident happened to Alaska Airlines. During ground handling a ramp worker 10) _____ the aircraft. This created 11) _____ in the metal skin. This damage was not 12) _____ and the plane 13) _____. At 26,000 feet the crease in the metal gave way due to the growing 14) _____ in pressure. The cabin depressurized with 15) _____. The crew had to descent immediately to 16) _____ air.

Ex. 7. Make up sentences using the following words:

- 1) by/ the aircraft/ the airport/ ground equipment/ are/ at/ damaged/ often.
- 2) close proximity/ operate/ must/ in/ equipment/ the fuselage/ ground/ to/ and wings.
- 3) a dent/ a flight/ the safe operation/ can/ serious enough/ for/ be/ of.
- 4) the departure/ the damage/ reported/ wasn't/ before.
- 5) frightening/ depressurized/ all aboard/ the cabin.

SPEECH EXERCISES

Ex. 1. Answer the questions:

- 1) Why are aircraft often victims of damage caused by ground equipment at the airport?
- 2) What form may damage be in?
- 3) Why is damage always inspected, measured and tested?
- 4) What happened to Alaska Airline MD-83 aircraft?
Describe the incident in details.
- 5) What are three pieces of ground equipment that most frequently damage aircraft?

Ex. 2. Decide whether the following statements are true or false:

- 1) Aircraft are often victims of damage caused by ground equipment at the airport.
- 2) In the act of servicing the aircraft between flights a great deal of ground equipment must operate in close proximity to the landing gear.
- 3) The outer skin doesn't play a critical role in the safe operation of a flight.
- 4) A dent that may look no worse than common parking damage to an automobile can be serious enough to ground an airplane until a repair can be made.

- 5) The damage of Alaska Airline MD-83 aircraft was reported and the plane was grounded.
- 6) Alaska Airline MD-83 aircraft crashed due to cabin depressurization.
- 7) The three pieces of ground equipment that most frequently damage aircraft are the passenger boarding bridge, catering trucks, and cargo "beltloaders".

Ex. 3. Make up all possible questions to the following sentences:

- 1) A great deal of ground equipment operates in close proximity to the fuselage and wings.
- 2) Any equipment found on an airport ramp can damage an aircraft through careless use.

Ex. 4. Retell the text using the following key words, do not refer to the text:

- 1.- aircraft - victims - damage - ground equipment;
- 2.- operate - close proximity - fuselage and wings;
- 3.- simple scratches - paint - dents – skin;
- 4.- all damage - inspect - measure - test - to ensure - safe tolerances;
- 5.- an example - seriousness - depressurization incident;
- 6.- a ramp worker – hit;
- 7.- create - a crease - metal skin;
- 8.- not report - depart - at 26,000 feet;
- 9.- cabin - depressurized - bang - frightening - rapid descent - denser (breathable) air - emergency landing;
- 10.- most frequently - boarding bridge - catering trucks - cargo "beltloaders";
- 11.- careless use - high winds - mechanical failure.

Ex. 5. Find information about ground damage incidents and describe them.

GRAMMAR EXERCISES

Ex. 1. Translate the sentences paying attention to the Infinitive construction "Complex Object":

a) 1. We proved this suggestion to be wrong. 2. There were some reasons to believe it to be the case. 3. Jordan supposed the statement not to be obvious and believed it to require a proof. 4. One might expect the specimens to be morphologically extreme. 5. Aristotle supposes happiness to be associated with some other human activity. 6. The expert defines two testing systems to be equivalent. 7. We shall consider a controller to be a system of reactors. 8. We expect the document to serve experienced programmers. 9. The rule requires all arguments to be available before execution can take place. 10. Unfortunately at the same time another station may have detected the network to be free and started to broadcast its message. 11. Although this quantity is not the same, many workers in the past have assumed it to be so. 12. One would expect

the true value to have a 90 % chance. 13. We heard the construction of railway facilities benefit fully from the system.

b) 1. We made this reaction run at reduced pressure. 2. We could not get this product to polymerize. 3. Inevitably the adoption of a data base approach causes any single process to be less efficient. 4. High temperatures allowed the reaction to be carried out in two hours. 5. It is usually rather difficult to get nitrogen to combine with other elements. 6. These properties led him to suggest that they had prepared a novel compound. 7. Such systems permit the properties of a particular machine to be exploited to the full. 8. Have the user participate in writing the manual! 9. This causes amorphous phosphates to be hygroscopic. 10. Finding methods of getting programmers to write more local programs is a worthy long-range goal. 11. Assuming the initiation to be instantaneous, the reactions are propagation reactions. 12. A decrease in pressure will cause the original sample to change into two phases.

Ex. 2. Translate the sentences paying attention to the Infinitive construction “Complex Subject”:

1. The lecture was said to be very interesting. 2. The members of the committee are reported to come to an agreement. 3. The English delegation is believed to come at the end of the month. 4. She seems to know English and French. 5. He proved to be a good teacher. 6. This school is considered to be the best in the town. 7. The weather appears to be improving. 8. The doctor happened to be there at the time of the accident. 9. She seems to be waiting for you. 10. Lake Baikal is said to be the deepest in the world. 11. This picture proved to be the best at the exhibition. 12. These two scientists happened to work at the same problem. 13. You are supposed to graduate in four years. 14. Radium is said to be very radioactive. 15. His invention is considered to be of great importance. 16. The new plant is reported to be put into operation next year. 17. This material is supposed to have many advantages. 18. For a long time the atom was thought to be indivisible. 19. He was said to be one of the most promising nuclear physicists. 20. The number of unemployed is reported to be increasing. 21. Many new textbooks are expected to be published soon. 22. A man was seen to enter the house. 23. These devices are known to be very effective. 24. I happened to be present at the opening session. 25. She is not likely to change her opinion. 26. This new medicine is sure to help your grandmother. 27. The new method of work turned out to be very effective.

Ex. 3. Change the sentences using the Infinitive construction “Complex Subject”:

The model: It is said that he is an Olympic champion. – He is said to be an Olympic champion.

1. It is said that she is a good doctor. 2. It is known that they are good friends. 3. It is reported that the expedition will arrive in two days. 4. It is known that this library has a big collection of manuscripts. 5. It is expected that our students will have new computers this year. 6. It was heard that the film was a great success. 7. It was seen

that the car stopped near the house. 8. It was expected that the document would be signed next week. 9. It is believed that our team will be the winner. 10. It is announced that the new law will be published in some newspapers. 11. People consider the climate there to be very good. 12. It is said that the book is very popular with young people. 13. It seems that the students know the subject well. 14. It so happened that I was present at the opening session.

SUPPLEMENTARY READING

Ground handling

Ground Handling offers a full range of handling services to Carriers.

This service includes: provision of electrical power sources and air conditioning units, communication between the ground bridge and the cockpit of the aircraft, towing of the aircraft, provision of equipment for landing, disembarking of passengers, provision of a bridge mechanism for loading and unloading of containers, internal cleaning of cabins and external cleaning of the aircraft from frost, snow, and ice by means of heating machines and special de-icing liquids. Most big airports are equipped with modern de-icing equipment, which ensures the flight safety, regardless of weather conditions. It also provides cleaning of sanitary-sewer and water-operated systems of the aircraft refuel of hydraulic and gas systems of the aircraft, heating of the cockpit and cabin of the aircraft, refuelling of the aircraft.

For the provision of these types of services for 24 hours per day the airport needs to be supplied with engineers and technical specialists with certified qualifications; mechanical operators; and cleaning technicians equipped with electro-mechanical means and chemical fluids for cleaning and washing the aircraft.

Ex. 1. Form the phrases according to the text:

A	B
1) ground	a) passengers
2) handling	b) conditioning units
3) electrical power	c) cabins
4) air	d) liquids
5) ground	e) aircraft
6) towing of	f) specialists
7) disembarking of	g) qualifications
8) loading and unloading of	h) sources
9) internal cleaning of	i) machines
10) external cleaning of	j) Handling
11) heating	k) aircraft
12) de-icing	l) bridge
13) technical	m) containers
14) certified	n) services

15) electro-mechanical o) means

Ex. 2. Make as many derivatives as you can:

Example: Provision – provide

- 1) towing – 1. ...
- 2) equipment – 1. ...
- 3) landing – 1. ...
- 4) disembarking – 1. ... 2. ... 3. ... 4. ...
- 5) load – 1. ... 2. ...
- 6) heating – 1. ...
- 7) de-icing – 1. ...
- 8) regardless – 1. ...
- 9) refueling – 1. ... 2. ... 3. ...
- 10) certificate – 1. ...
- 11) operator – 1. ... 2. ...
- 12) wash – 1. ...

Ex. 3. Retell the text using the following word combinations:

1. - a full range of handling services;
2. - provision of electrical power sources and air conditioning units - communication between the ground bridge and the cockpit - towing of the aircraft - equipment for landing - disembarking of passengers - bridge mechanism for loading and unloading of containers - internal cleaning of cabins and external cleaning of aircraft;
3. - big airports - modern de-icing equipment - flight safety;
4. - cleaning of sanitary-sewer and water-operated systems - refueling of ... - heating of ...;
5. - to be supplied with engineers and technical specialists - mechanical operators – cleaning technicians - equipped with electro-mechanical means - chemical fluids for ...

Ex. 4. Give some examples of Ground Handling in the airports of our country and abroad and compare them.

PART 2

HOW AIRPORT SECURITY WORKS

UNIT 1

Task 1. Read and translate the text:



Terrorism has been a problem for airlines and air travellers since the 1970s, when hijackings and bombings became the method of choice for subversive, militant organizations around the world. Although security at airports has always been tight, the 9/11 attacks woke many people up to a harsh reality - it wasn't tight enough. On that day, men armed with simple box cutters took over four passenger jets and used them as flying bombs. What security measures might have stopped them? How has airport security changed since then? According to the Department of Homeland Security, 730 million people travel on passenger jets every year, while more than 700 million pieces of their baggage are screened for explosives and other dangerous items.

The First Line of Defense

Imagine for a second that you are a terrorist who wants to blow up or hijack a plane. You know that once you get inside the airport, you will have to pass through metal detectors, bomb-sniffing dogs, and possibly a search of your clothes and luggage. How could you bypass all of those security measures? You could climb a fence or drive a truck to a sensitive area of the airport. For this reason, the first line of defense in airport security is the most obvious: fences, barriers and walls. Tall fences that would be difficult to climb enclose the entire airport property. Security patrols regularly scan the perimeter in case someone tries to cut through the fence. Especially sensitive areas, like fuel depots or the terminals and baggage handling facilities are even more secure, with more fences and security checkpoints. All access gates are monitored by either a guard station or surveillance cameras. Another risk is that someone could drive a truck or car containing a bomb up to the airport terminal entrance and just blow up the airport itself. Airports have taken several steps to prevent this. Large concrete barriers, designed to block vehicles up to the size of large moving trucks, can be deployed if a threat is detected. Loading zones, where people once parked their cars to get their baggage in or out of the trunk, are now kept clear of traffic. No one is allowed to park close to the terminal.

Task 2. Memorize the following words and word combinations:

subversive - подрывной, Department of Homeland Security - министерство внутренней безопасности, passenger jet - реактивный лайнер, to be screened (for)- проходить проверку на, explosive - взрывчатое вещество, to blow up – взрывать, to bypass - обходить, patrol – патрулирование, sensitive areas - уязвимые районы,

baggage handling - обработка багажа, checkpoint – контрольный пункт, to monitor-следить за, to detect - обнаруживать, to enclose - окружать.

Task 3. Answer the following questions:

1. Why has terrorism been a problem for airlines and air travellers since 1970s?
2. Why has airport security changed since 9/11?
3. What is the first line of defence in airport security?
4. Why do security patrols regularly scan the perimeter?
5. Are all access gates monitored only by a guard station?
6. What steps have airports taken if a threat is detected?
7. What is now kept clear from traffic?
8. Is anyone allowed to park close to the terminal?

Task 4. Find the English equivalents to Russian words and word combinations:

Авиапассажиры, угон самолёта, суровая реальность, канцелярские ножницы, меры безопасности, министерство внутренней безопасности, опасные грузы, взорвать или угнать самолёт, проходить через металлоискатели, закрытые зоны аэропорта, ограждения, барьеры и стены, оборудование для обработки багажа, патрулирование в целях обеспечения безопасности, шлагбаумы, пост охраны, камеры наблюдения, бетонные ограждения, в случае обнаружения угрозы, парковаться рядом с терминалом.

Task 5. Complete the following statements:

1. Although security.... the 9/11 attacks woke many people up to a harsh reality.
2. More than 700 million pieces of their baggage.... dangerous items.
3. The first line of defense in airport security.... and walls.
4. Loading zones.... are now kept clear of traffic.
5. Tall fences the entire airport property.

Task 6. Translate the following sentences into English:

1. Ты сможешь пройти через металлодетектор.
2. Эти люди находятся здесь по приказу Министерства внутренней безопасности, чтобы спрятать тебя в безопасном месте.
3. Они усилили пограничный контроль и повысили уровень безопасности в аэропортах.
4. Однако, несмотря на принятие этих мер безопасности, нападения продолжились.
5. Площадь терминала аэропорта составляет 60,200 кв м, в нём расположено 45 стоек регистрации и 11 контрольно-пропускных пунктов.
6. Наши сенсоры обнаружили, что нашим системам жизнеобеспечения грозит опасность.

7. Он пояснил, что существует ряд причин, по которым авиапассажиров задерживают при вылете или прилёте.

Task 7. Put in prepositions:

1. that day, men armed simple box cutters took four passenger jets.
2. 700 million pieces of their baggage are screened explosives and other dangerous items.
3. Once you get the airport, you will have to pass metal detectors.
4. No one is allowed to park close the terminal.
5. Security patrols regularly scan the perimeter case someone tries to cut the fence.
6. All access gates are monitored either a guard station or surveillance cameras.
7. Loading zones, where people once parked their cars to get their baggage or.... of the trunk, are now kept clear traffic.

Task 8. Make up all possible types of questions to the following sentences:

1. Security patrols regularly scan the perimeter.
2. Hijackings became the method of choice for militant organizations around the world since 1970s.

Task 9. Explain the meaning of the following words and phrases within the text:

1. Hijacking
2. Security measures
3. Explosives
4. Dangerous items
5. Security patrol
6. Fuel depots
7. Terminal
8. Access gates

Task 10. Retell the text in 10-12 sentences.

GRAMMAR REVIEW

Ex. 1. Choose the right variant:

1. I would (have brought/bring) the book, but you did not tell me you needed it.
2. It would (be/have been) wise of you to consult a dentist twice a year.
3. I think nobody would (object/have objected) to having a party tomorrow.
4. I did not know that it was so important for you. I would (do/have done) it long ago.
5. If I were you I wouldn't (argue/have argued) with her yesterday. She is your boss.

6. Last year he wouldn't (say/have said) so of John. I wouldn't (worry/have worried) about it now. Everything will clear up soon.
7. We would (stay/have stayed) for an hour, but it is rather late.
8. We did not know that we would come to the lake. We would (take/ have taken) our rods.
9. I would (go/have gone) to sea, but my father wanted me to be a lawyer.

Ex.2. Open the brackets using the proper form of the subjunctive mood:

1. He failed to appreciate our difficulty. He (behave) differently if he (realize) the situation.
2. He often asks me about you. If you (come) to see him tonight, he (be) delighted.
3. Why did you leave so hurriedly? If you (stay) there for another week, he (finish) your portrait.
4. Why do you always talk in such a scornful manner? If I (be) in your shoes, I (not be) so rude.
5. If you (smoke) less, you (feel) much better.
6. I think that if you (tell) them that our invitation still stands, they (give) it another thought.
7. She (do) her best to save the situation if she (be) there but she was on business then.
8. Where you (go) if you (be) leave now?
9. How about, going to Spain? The weather (be) perfect if we (go) now, and we (be) able to go water-skiing.
10. If Jack (come) home earlier last night, he (call) you back.
11. If you (not complain) so much then, everyone (be) satisfied and she (not) be fired.
12. What you (reply) if somebody (apologize) to you?

Ex. 3. Choose the right variant and translate the sentences into Russian:

1. She wished at that moment she (had not sent/did not send) for him.
2. "I wish I (had been/were) there with you," he said with deep regret.
3. She says she wishes I (had been/were) a thousand miles away.
4. I wish she (had not looked/did not look) so sad.
5. The professor wishes I (had studied/studied) harder.
6. We wished he (had not come/did not come) so late yesterday.
7. I wish you (had seen/saw) the play. It was a great success.
8. I wish they (had introduced/introduced) their friends to me at the party.
9. She wishes her father (hadn't known/ didn't know) it.
10. He wished they (hadn't noticed/didn't notice) his embarrassment.

Ex. 4. Paraphrase the following sentences using the subjunctive mood after the verb wish:

Example: It's a pity you are so busy these days. — I wish you were not so busy these days.

1. It's a pity we won't be able to reach the village before sunset.
2. My friend regrets not having told you all at once.
3. What a pity you are leaving so soon.
4. Unfortunately, he did not receive the answer before Christmas.
5. I am sorry I made you upset by bringing such depressing news.
6. The patient was sorry that he had not fulfilled all the doctor's instructions.
7. She was sorry she had no money to buy a toy for her son.
8. They were disappointed that they had not persuaded her.
9. It's a pity we are not so young as you are.

UNIT 2 WHO ARE YOU?

Task 1. Read and translate the text:

One of the most important security measures at an airport is confirming the identity of travelers. This is done by checking a photo ID, such as a driver's license. If you are traveling internationally, you need to present your passport. Simply taking a look at a photo ID isn't enough, however. The high-tech buzzword in airport security today is biometrics. Biometrics essentially means checking fingerprints, retinal scans, and facial patterns using complex computer systems to determine if someone is who they say they are - or if they match a list of people the government has determined might be potential terrorists. A new system called CAPPS II could help accomplish some of this. Short for Computer Assisted Passenger Prescreening System, CAPPS II will require more personal information from travelers when they book their flights, which will lead to a risk assessment of no risk, unknown risk, elevated risk, or high risk. Passengers considered risky will be further screened. Although the system has been delayed and isn't in place yet, the Department of Homeland Security (DHS) predicts that CAPPS II will make check-in faster for the average traveler. You may have noticed the public address system at an airport replaying an automated message telling you not to leave your bags unattended. And you've probably noticed that check-in attendants are asking some questions that sound a little odd:

- “Has your luggage been in your possession at all times?”
- “Has anyone given you anything or asked you to carry on or check any items for them?”

These are very important questions. A tactic used on occasion by terrorists is to hide a bomb inside an unsuspecting person's luggage. Another tactic is to give something, maybe a toy or stuffed animal, to someone who is about to board a plane.

That innocent-seeming object may actually be a bomb or other harmful device. Just a month after the 9/11 attacks, the President signed a new law that restructured and refocused the airport security efforts of the U.S. The Aviation and Transportation Security Act established a new agency, the Transportation Security Administration (TSA). The TSA is part of the Department of Homeland Security. The TSA's mission is to:

- Prevent attacks on airports or aircraft.
- Prevent accidents and fatalities due to transport of hazardous materials.
- Ensure safety and security of passengers.

While the TSA deals with all forms of transportation, the Federal Aviation Administration (FAA) is devoted entirely to the operation of the U.S.'s civil aviation. FAA agents are located at every major airport for immediate response to possible threats. Most major airports also have an entire police force, just like a small town, monitoring all facets of the facility. Background checks are required on all airport personnel, from baggage handlers to security-team members, before they can be employed. All airport personnel have photo-ID cards with their name, position and access privileges clearly labeled.

Task 2. Memorize the following words and word combinations:

Buzzword, biometrics, confirming the identity, checking fingerprints, retinal scans, facial patterns, Computer Assisted Passenger Prescreening System, risk assessment, elevated risk, to board a plane, harmful device, check-in attendants, stuffed animal, to leave your bags unattended, Transportation Security Administration, to prevent accidents and fatalities, transport of hazardous materials, Ensure safety and security of passengers, immediate response, monitoring all facets, to deal with all forms of transportation, baggage handlers.

Task 3. Answer the following questions:

1. What do you think one of the most security measures at an airport is?
2. How is confirming the identity of travelers done?
3. What does biometrics mean?
4. What is CAPPS II short for?
5. How could CAPPS II help accomplish check-in?
6. What questions are check-in attendants asking?
7. What is the TCA and its mission?
8. What does the TCA deal with?
9. Why are FAA agents located at every major airport?
10. Do you think all airports have an entire police force, just like a small town?

Task 4. Find the English equivalents to Russian words and word combinations:

Подтверждение личности путешественников, модное словечко, биометрия, отпечаток пальца, сканирование сетчатки глаза, шаблон выражения лица,

совпадать со списком людей, бронировать авиабилеты, система предварительного досмотра пассажиров с использованием компьютеров, требовать больше личной информации, оценка рисков, система оповещения публики, оставить сумки без присмотра, звучать немного странно, ничего не подозревающий багаж человека, администрация транспортной безопасности, предотвращение несчастных случаев и смертельных случаев, обеспечение охраны и безопасности пассажиров, немедленное реагирование на возможные угрозы, перевозить опасные материалы, обеспечить охрану и безопасность пассажиров, проверка анкетных данных, грузчики багажа, права доступа, персонал аэропорта.

Task 5. Complete the following statements:

1. The high-tech buzzword in airport security today is....
2. Passengers considered risky will be
3. Biometrics essentially means....
4. The TSA's mission is to....
5. The Federal Aviation Administration (FAA) is devoted entirely....
6. FAA agents are located
7. All airport personnel have....

Task 6. Explain the meaning of the following words and phrases within the text:

1. Confirming the identity of travelers
2. Biometrics
3. The public address system
4. Security efforts
5. Check-in attendants

Task 7. Translate the following sentences into English:

1. Необходимо организовать надлежащее обучение персонала аэропортов.
2. У меня есть программы, которыми можно проанализировать его биометрические данные.
3. Вы можете зарегистрироваться непосредственно с мобильного через приведенную в письме ссылку.
4. Международное сотрудничество осуществляется в целях управления рисками, предотвращения аварий, реагирования на чрезвычайные ситуации и смягчения последствий.
5. Эти электронные личные данные передаются нам автоматически.
6. Запрещено выносить любые предметы или документы из этой комнаты.
7. За последние несколько лет положения, касающиеся опасных материалов, претерпели существенные изменения.

Task 8. Make up all possible types of questions to the following sentences:

1. A new law restructured and refocused the airport security efforts of the U.S.
2. FAA agents are located at every major airport for immediate response to possible threats.

Task 9. Retell the text in 10-12 sentences.

GRAMMAR REVIEW

Ex.1. Change the following into indirect speech:

1. "I have something to tell you," I said to her.
2. "I met her for the first time on a warm sunny morning last spring," he said.
3. "I am going to call again tomorrow, mother," she said.
4. "I've been to Turkey twice, but so far I haven't had time to visit Istanbul," said Robert.
5. "It will be very difficult to persuade her to take care of herself, doctor," I replied.
6. "The president is to come to Madrid the day after tomorrow," said the BBC announcer.
7. "We have a lift but very often it doesn't work," they said.
8. "We have bought a new flat. But we don't like it so much as our last one," said my cousin.
9. "I have left a message for him, but he hasn't phoned yet," she said.
10. "I've no idea who has done it but I'll find out," said Peggy.
11. He said, "My mother has just been operated on,"
12. "I have a French lesson this evening and I haven't done my homework yet," said the small boy.
13. "She has been sitting in the garden since the police came," I said to the officer.
14. "You haven't closed the window and have forgotten to turn off the light," he pointed out.

Ex.2. Change the following special questions into indirect speech. Begin your sentences with the words *I/he wondered, we/they asked, she/he wanted to know, etc.*

Example: When did she go shopping? — He asked when she had gone shopping.

1. Why did he decide to go to Ethiopia?
2. When was she sent on business?
3. Who will fulfil this task?
4. How long has she been staying here?
5. Who was he speaking to when I came up to him?
6. Who will play the role of Hamlet?
7. What is shown in this diagram?
8. What is he going to do on Sunday?
9. How long have they been developing this project?
10. Who was this book written by?

Ex. 3. Imagine that you have come to study to a foreign country and students are asking you questions. Report these questions later to your friend:

Example: "What country do you come from?" asked Bill. — Bill asked what country I came from. "Do you often go to the swimming-pool?" asked Pete. — Pete asked if I often went to the swimming-pool.

1. "How long have you been here?" said Ann.
2. "Are you working as well as studying?" asked Peter.
3. "Have you got a work permit?" Bill wanted to know.
4. "What are you going to study?" asked Ann.
5. "Have you enrolled for more than one class?" said Peter.
6. "Do you want to buy any second-hand books?" said Bill.
7. "Have you seen the library?" asked Ann.
8. "Do you play rugby?" said Peter.
9. "Will you have time to play regularly?" he went on.
10. "Did you play for your school team?" asked Bill.
11. "Are you interested in acting?" asked Ann.
12. "Would you like to join our drama group?" she asked.
13. "What do you think of our canteen?" asked Pete.

Ex. 4. Change commands, requests, recommendations into indirect speech:

Example: "Close the door," she asked me. — She asked me to close the door.

1. "Open the safe!" the raiders ordered the bank clerk.
2. "Please do as I say," he begged me.
3. "Help your mother, Peter," Mr. Pitt said.
4. "Don't make too much noise, children," he said.
5. "Do whatever you like," she said to us.
6. "Don't miss your train," she warned them.
7. "Read the document before you sign it," the lawyer said to his client.
8. "Fill in the blank again," he said.
9. "Buy a new car," I advised him.
10. "Don't drive too fast," she begged him.
11. "Don't put your bicycle near my window," said the shopkeeper to me.
12. "Come to the cinema with me," he asked her.
13. "Cook it in butter," I advised her.
14. "Send for the fire brigade," the manager said to the porter.
15. "Please pay at the desk," said the shop assistant to her.
16. "Don't argue with me," said the teacher to the boy.
17. "Pull as hard as you can," he said to her.
18. "Don't lend anything to her," he advised us.
19. "Stand clear off the door," a voice warned the people.
20. "Put down that gun. It's loaded," she warned him.

UNIT 3

STEP THROUGH, PLEASE: X-RAY SYSTEM

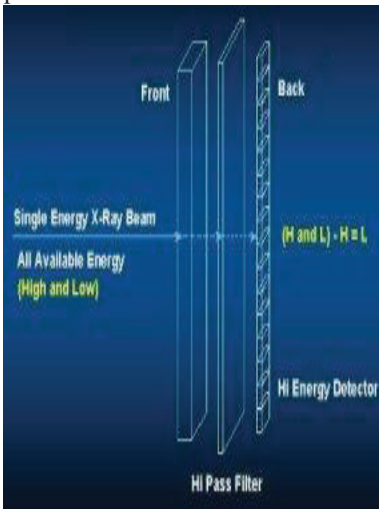
Task 1. Read and translate the text:



Your carry-on items are sent through a machine that X-rays the contents.

While you are stepping through the metal detector, your carry-on items are going through the X-ray system. A conveyor belt carries each item past an X-ray machine. X-rays are like light in that they are electromagnetic waves, but they are more

energetic, so they can penetrate many materials. The machine used in airports usually is based on a dual-energy X-ray system. This system has a single X-ray source sending out X-rays, typically in the range of 140 to 160 kilovolt peak (KVP). KVP refers to the amount of penetration an X-ray makes. The higher the KVP, the further the X-ray penetrates.



In a dual-energy X-ray system, the X-rays pass through a detector, a filter and then another detector.

After the X-rays pass through the item, they are picked up by a detector. This detector then passes the X-rays on to a filter, which blocks out the lower-energy X-rays. The remaining high-energy X-rays hit a second detector. A computer circuit compares the pick-ups of the two detectors to better represent low-energy objects, such as most organic materials. Since different materials absorb X-rays at different levels, the image on the monitor lets the machine operator see distinct items inside your bag. Items are typically colored on the display monitor, based on the range of energy that passes through

the object, to represent one of three main categories:

- Organic
- Inorganic
- Metal

While the colors used to signify "inorganic" and "metal" may vary between manufacturers, all X-ray systems use shades of orange to represent "organic." This is because most explosives are organic. Machine operators are trained to look for

suspicious items -- and not just obviously suspicious items like guns or knives, but also anything that could be a component of an improvised explosive device (IED). Since there is no such thing as a commercially available bomb, IEDs are the way most terrorists and hijackers gain control. An IED can be made in an astounding variety of ways, from basic pipe bombs to sophisticated, electronically-controlled component bombs.



An X-ray of a bag notice that all organic items are a shade of orange.

A common misconception is that the X-ray machine used to check carry-on items will damage film and electronic media. In actuality, all modern carry-on X-ray systems are considered film-safe. This means that the amount of X-ray radiation is not high enough to damage photographic film. Since electronic media can withstand much more radiation than film can, it is also safe from damage. However, the CT scanner and many of the high-energy X-ray systems used to examine checked baggage can damage film (electronic media is still safe), so you should always carry film with you on the plane. Electronic items, such as laptop computers, have so many different items packed into a relatively small area that it can be difficult to determine if a bomb is hidden within the device. That's why you may be asked to turn your laptop or PDA on. But even this is not sufficient evidence since a skilled criminal could hide a bomb within a working electronic device. For that reason, many airports also have a chemical sniffer. This is essentially an automated chemistry lab in a box. At random intervals, or if there is reason to suspect the electronic device that someone is carrying, the security attendant quickly swipes a cloth over the device and places the cloth on the sniffer. The sniffer analyzes the cloth for any trace residue of the types of chemicals used to make bombs. If there is any residue, the sniffer warns the security attendant of a potential bomb. In addition to desktop sniffers like this, there are handheld versions, that can be used to "sniff" lockers and other enclosed spaces and unattended luggage. Walk-through models, such as GE's Entry Scan 3, are also available. These sniffers can be used to detect explosives and narcotics.

Task 2. Memorize the following words and word combinations:

Metal detector, X-ray system, conveyor belt, electromagnetic waves, to penetrate, to better represent, pickups, to absorb, distinct items, machine operators, to look for suspicious items, improvised explosive device, to gain control, an astounding variety of ways, sophisticated, electronically-controlled, common misconception, to damage film and electronic media, film-safe, to damage photographic film, to withstand, sufficient evidence, a chemical sniffer, to suspect the electronic device, security attendant, handheld versions, other enclosed spaces, unattended luggage.

Task 3. Answer the following questions:

1. What are your carry-on items going through?
2. What carries each item past an X-ray machine?
3. Why can X-rays penetrate many materials?
4. What is the machine used in airports usually based on?
5. By what do you think X-rays are picked up?
6. Does a filter or a second detector block out lower-energy X-rays?
7. What rays hit a second detector?
8. For what does a computer circuit compare the pick-ups of the two detectors?
9. What are the main categories of items on the display monitor?
10. Why do all X-ray systems use shades of orange to represent "organic"?
11. What does an IED stand for?
12. Where can an IED be made?
13. What does "film-safe" mean?
14. Why may you be asked to turn your laptop or PDA on?
15. Why do many airports also have a chemical sniffer?

Task 4. Find the English equivalents to Russian words and word combinations:

Ручная кладь, ленточный транспортёр, степень проникновения, поглощать рентгеновские лучи, компьютерная схема, означать, обучены поиску подозрительных предметов, самодельное взрывное устройство, поразительное разнообразие способов, взять под контроль, сложный компонент с электронным управлением, распространённое заблуждение, повредить пленку и электронные средства, выдерживать гораздо больше радиации, досмотр зарегистрированного багажа, достаточное доказательство, рабочее электронное устройство, автоматическая химическая лаборатория в коробке, в случайном порядке, обнаружение взрывчатых веществ методом анализа выделяемых ими химических паров, остаточные следы примеси, предупреждать, портативные версии.

Task 5. Complete the following sentences:

1. While you are stepping through the metal detector....
2. The machine used in airports usually....
3. After the X-rays pass through the item....
4. This detector then passes the X-rays on to a filter....
5. A computer circuit compares the pick-ups of the two detectors to....
6. While the colors used to signify "inorganic" and "metal" may vary between manufacturers....
7. An IED can be made in an astounding variety of ways....
8. However, the CT scanner and many of the high-energy X-ray systems used to....
9. The sniffer analyzes the cloth for....
10. In addition to desktop sniffers like this....

Task 6. Explain the meaning of the following words and phrases within the text:

1. Dual-energy X-ray system
2. Kilovolt peak (KVP)
3. Improvised explosive device (IED)
4. Film-safe
5. Chemical sniffer
6. Carry-on items

Task 7. Translate the following sentences into English:

1. Возможно, я смогу проникнуть в компьютер их системы безопасности.
2. Благодаря этому простому принципу мы можем создать невероятно разнообразные формы.
3. Досмотр зарегистрированного багажа с помощью рентгеновских аппаратов является предусмотренной мерой безопасности.
4. Багаж, который вы не регистрируете, а провозите с собой в салоне самолета, называется ручная кладь.
5. Комиссия также обобщила всю имеющуюся у нее информацию и результаты расследования относительно контейнера, в котором находилось самодельное взрывное устройство.
6. Я не хочу иметь необходимость предупреждать тебя снова.
7. Кроме того, все пассажиры должны проходить через металлоискатель, подлежат проверке ручным металлодетектором, а также обязаны проходить через рентгеновскую установку перед посадкой в самолет.
8. Национальные и международные правоохранительные учреждения осуществляют обмен информацией о перевозках подозрительных предметов.
9. Домашние животные могут входить как зарегистрированный багаж пассажиров, в салоне или в качестве груза.

Task 8. Make up all possible types of questions to the following sentences:

1. The sniffer analyzes the cloth for any trace residue of the types of chemicals used to make bombs.
2. The machine used in airports usually is based on a dual-energy X-ray system.

Task 9. Retell the text in 10-12 sentences.

GRAMMAR REVIEW

Ex. 1. Open the brackets and fill in with the proper participle:

1. He fell asleep (exhaust) by the journey.
2. She entered the dining room (accompany) by her husband and her father.

3. A snake (sleep) in the grass will bite if anyone treads upon it.
4. (Fill) his pockets with apples the boy was about to run away when he saw the owner of the garden with a stick in his hand.
5. It was a bright Sunday morning of early summer (promise) heat.
6. When I came home, I found the table (lay).
7. (Judge) by the color of the sun it should be windy tomorrow.
8. (Arrive) at a big seaport, I started to look for a job.
9. He had received an urgent message (ask) him to telephone Sir Matthew.
10. He looked at groups of young girls (walk) arm in arm.
11. In the wood they sat down on a (fall) tree.
12. (See) from the hill the city looks magnificent.
13. (Not know) where to go he turned to a passerby.
14. (Lock) in her room she threw a fit.
15. (Address) the parcel, I went out at once to post it.
16. She often took care of my little sister (give) me a possibility to play with other boys.
17. (Wash) her face in cold water, she came up to the window and shut it.
18. Paul sat down again, evidently (change) his mind about going.

Ex. 2. Choose the right variant:

1. She stayed ___ in her room, ___ to come downstairs.
 - a) having locked, refused
 - b) locked, refusing
 - c) locking, having refused
2. She had a good practical knowledge of French ___ as an interpreter for many years in France.
 - a) working
 - b) having worked
 - c) worked
3. When we ___ from our day's outing came into the kitchen, we found dinner ___.
 - a) returned, serving
 - b) having returned, served
 - c) returning, having served
4. ___ by his elbow, Mary listened to their talk.
 - a) supported
 - b) supporting
 - c) having supported
5. Fruits ___ in hothouses are not so rich in colour, taste and vitamins as fruits ___ in natural conditions.
 - a) having grown, grown
 - b) grown, growing

- c) growing, having grown
6. I admired the grounds and trees ___ the house.
- a) surrounding
b) having surrounded
c) surrounded
7. She looked at the scene ___ to the innermost of her heart.
- a) shaking
b) shaken
c) having shaken

Ex. 3. Open the brackets and use participial constructions with the conjunctions *when, while, as if, as though, if, till, unless*:

Example: When you cross the street, be careful at the crossroads. — When crossing the street, be careful at the crossroads.

1. When he was lying, he spoke more quickly than when he was telling the truth.
2. She stood in front of the mirror as if she were speaking to herself.
3. She screamed as though she had been badly hurt.
4. He is a quiet man. He never hurries unless he is pressed for time.
5. While I was waiting for you, I was looking through newspapers and magazines.
6. When he was asked about it, he could say nothing.
7. While I was crossing the street yesterday, I saw an accident.
8. A promise accounts so little till it is kept.
9. When he was a student he used to study at the library.
10. He was hesitating whether for take the step, which if it was mistaken, could put him to trouble.

UNIT 4

CHECK YOUR BAGS: CT SCANNERS

Task 1. Read and translate the text:

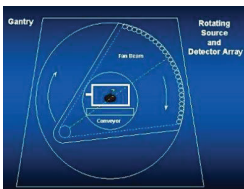


Diagram shows how the X-ray system in a CT scanner rotates around a bag. The first security check that your checked bags go through depends on the airport. In the United States, most major airports have a computer tomography (CT) scanner. A CT scanner is a hollow tube that surrounds your bag. The X-ray mechanism revolves slowly around it, bombarding it with X-rays and recording the resulting data. The CT scanner uses all of this data to create a very detailed tomogram(slice) of the bag. The scanner is able to calculate the mass and density of individual objects in your bag based on this tomogram. If an object's

mass/density falls within the range of a dangerous material, the CT scanner warns the operator of a potential hazardous object.

CT scanners are slow compared to other types of baggage-scanning systems. Because of this, they are not used to check every bag. Instead, only bags that the computer flags as "suspicious" are checked. These flags are triggered by any anomaly that shows up in the reservation or check-in process. For example, if a person buys a one-way ticket and pays cash, this is considered atypical and could cause the computer to flag that person. When this happens, that person's checked bags are immediately sent through the CT scanner, which is usually located somewhere near the ticketing counter.

Now Boarding: while most of the things that you can't take on board an airplane are fairly obvious (guns, knives, explosives), there are some things that most people wouldn't think about. Who would have thought that a smoke detector could be considered hazardous? If you do transport a hazardous material on a passenger plane without declaring it, you could face a fine of up to \$27,500! Make sure you contact the local airport authority if you have any concerns about an item you plan to carry with you on a trip. Because terrorism is a constant and terrifying threat, this means that *any* mention of certain words, such as "bomb," "hijack" or "gun," can lead to your immediate removal from the plane and quite possibly your arrest, even if the word is said in an innocent manner. Everyone who works in aviation, from flight attendants to the security personnel, is trained to react immediately to those words.

YOU CAN'T TAKE IT WITH YOU

There are a number of items that you cannot carry on a plane, and some of that can't be packed in your bags, either:

Explosives: Fireworks, ammunition, sparklers, matches, gunpowder, signal flares.

Weapons: Guns, swords, pepper spray, mace, martial arts weapons, swords, knives with blades of any length.

Pressurized containers: Hair spray, oxygen tanks, propane tanks, spray paint, insect repellent.

Household items: Flammable liquids, solvents, bleach, pool chemicals, flammable perfume in bottles 16 ounces or larger.

Poisons: Insecticides, pesticides, rat poison, arsenic, cyanide.

Corrosives: Car batteries, acids, lye, drain cleaner, mercury.

Task 2. Memorize the following words and word combinations:

A computer tomography (CT) scanner, to revolve, to record the resulting data, to create a very detailed tomogram(slice) of the bag, to calculate the mass and density, to warn, potential hazardous object, baggage-scanning systems, a one-way ticket, ticketing counter, the local airport authority, a constant and terrifying threat, immediate removal, innocent manner, flight attendants, security personnel, to react immediately.

Task 3. Answer the following questions:

1. What does the first security check depend on?

2. What do most major airports in the United States have?
3. What is a CT scanner?
4. How does a CT scanner create a very detailed tomogram(slice) of a bag?
5. What is a scanner able to calculate based on this tomogram?
6. When does the CT scanner warn the operator of a potential hazardous object?
6. Why aren't CT scanners used to check every bag?
7. What happens if a person buys a one-way ticket and pays cash?
8. What can any mention of certain words, such as "bomb," "hijack" or "gun" lead to?
9. What items can't you carry on a plane?
10. Do you think some of that can be packed in your bags?

Task 4. Find the English equivalents to Russian words and word combinations:

Первая проверка безопасности, досмотренные вещи (сдаваемые в багаж), вращаться, полая трубка, регистрировать полученные данные, потенциально опасный объект, компьютер помечает как "подозрительный", сталкиваться со штрафом, довольно очевидны, постоянная и ужасная угроза, немедленное удаление с самолета, обучены реагировать немедленно, медленные по сравнению.

Task 5. Complete the following sentences:

1. A CT scanner is....
2. The X-ray mechanism revolves slowly....
3. The scanner is able to calculate....
4. If a person buys a one-way ticket and pays cash....
5. If you do transport a hazardous material on a passenger plane....
6. Because terrorism is a constant and terrifying threat, this means....

Task 6. Explain the meaning of the following words and phrases within the text:

1. The first security check
2. A computer tomography (CT) scanner
3. Flag that person
4. Face a fine
5. Immediate removal

Task 7. Translate the following sentences into English:

1. Водитель не имеет лицензии на перевозку опасных материалов.
2. Оставленный багаж будет конфискован службой безопасности.
3. Вы можете сэкономить время, зарегистрировавшись онлайн.
4. Полиция должна серьезно относиться к любым террористическим угрозам.
5. Правительство немедленно отреагировало на эту проблему.

6. На самолёт не пускают с пистолетом.

7. Багаж пассажира принимается к перевозке в качестве зарегистрированного багажа и перевозится в багажно-грузовых отсеках воздушного судна.

Task 8. Make up all possible types of questions to the following sentences:

1. CT scanners are slow compared to other types of baggage-scanning systems.
2. The CT scanner uses all of this data to create a very detailed tomogram of the bag.

Task 9. Retell the text in 8 -10 sentences.

GRAMMAR REVIEW

Ex. 1. Complete the following sentences with gerunds formed from the verbs below:

Buy, answer, pay, recognize, escape, comment, sign, help, make, go, see

1. ___ big prices for famous pictures is now a wealthy man's way of ___ taxation.
2. English grammar is very difficult and few writers have avoided ___ mistakes.
3. Maurice was saved from ___ by Kate's entry with the tray.
4. The elderly ladies enjoyed ___ who came in and out, ___ old friends, and ___ unfavourably how these had aged.
5. Of course the contract is mutually beneficial and he is all for ___ it.
6. The important part of his life is ___ people.
7. Parks at night is a dangerous place to walk. Avoid ___ there after darkness.
8. Father suggested ___ a new machine.

Ex. 2. Translate the following sentences paying attention to the Gerund:

1. Learning English is not an easy thing.
2. His friend began learning the English language.
3. Studying natural phenomena without making observations is useless.
4. There are many methods of solving this problem.
5. On coming home my father began watching television.
6. Russian scientists played an important part in solving the problem of atmospheric electricity.
7. On splitting atoms in the reactor heat is developed.
8. Seeing is believing.
9. Working with him was difficult.
10. Her only fun was reading books.
11. Nothing could stop Tim from being an engineer.
12. They give the impression of not working.
13. They have not spoken a word since leaving the party.
14. The whole evening was spent in deciding whether to go or not.
15. You can't make a good presentation without preparing for it.

16. We know of his house being destroyed by a stroke of lightning.
17. Franklin's having worked in the field of electricity is known the world over.
18. Everybody insisted on this experiment being made once more.
19. Carrying this test successfully was helped by the careful investigations of outstanding scientists.
20. You don't mind my mentioning it, do you?
21. Mastering this speciality is an indispensable thing.
22. I like studying English.
23. They spoke of organizing a meeting.
24. He tells me of his going on a mission tomorrow.
25. He insists on his being sent on a mission.

Ex. 3. Complete the following sentences using the Gerund:

Example: When will you finish (to read) ...? – When will you finish reading this scientific magazine?

1. Do you like (to go)?
2. My friend never thought of (to become)
3. This is a device for (to turn)
4. Excuse me for (to be late)
5. Why are you translating a scientific article without (to read)?
6. We went to the cinema instead of (to watch)
7. An electric lamp is used for (to light)
8. We began (to translate) the article after (to read)

Ex. 4. Choose the correct answer:

1. I don't like him taking so much of my time.
 - a) Мне не нравится, что он отнимает у меня столько времени.
 - b) Мне он не нравится, потому что отнимает у меня слишком много времени.
 - c) Я не хочу брать его с собой на столь длительное время.
2. We are tired of listening to her complaints.
 - a) Мы устали, слушая ее жалобы.
 - b) Нам надоело слушать ее жалобы.
 - c) Так как нам надоело слушать, мы пожаловались ей.
3. This accident was due to the driver's having been careless.
 - a) Авария должна была произойти из-за небрежного вождения.
 - b) Авария происходит, когда водители едут неосторожно.
 - c) Авария произошла из-за того, что водитель допустил небрежность.
4. They insist on the sample being tested repeatedly.
 - a) Они настаивают на том, чтобы повторить испытания образца.
 - b) Они настаивают на том, чтобы образец был многократно проверен.
 - c) Они настаивают на том, что проверили образец много раз.

5. His having conducted the experiment is a known fact.
 - a) То, что он должен провести этот эксперимент, фактически известно.
 - b) То, что он провел этот эксперимент, является известным фактом.
 - c) Факт проведения им этого эксперимента известен.
6. Дети любят, когда им читают.
 - a) Children like their reading.
 - b) Children like when them being read.
 - c) Children like being read to.
7. Партнеры не одобряют того, что он пренебрегает своими обязанностями.
 - a) The partners don't approve of his duties neglecting.
 - b) The partners don't approve of him neglecting his duties.
 - c) The partners don't approve of his having neglected his duties.
8. Почему вы избегаете говорить об этом?
 - a) Why do you avoid speaking about it?
 - b) Why do you avoid your speaking about it?
 - c) Why do you avoid being spoken about it?
9. Тренер гордится тем, что его команда заняла первое место.
 - a) The coach is proud of his team's taking first place.
 - b) The coach is proud of his team's having been taken first place.
 - c) The coach is proud of his team having taken first place.
10. Англичане были против введения евро в их стране.
 - a) The English were against the euro's introducing in that country.
 - b) The English were against the euro having been introduced in that country.
 - c) The English were against the euro being introduced in that country.

SUPPLEMENTARY READING

AIR MARSHALS

If fences and barriers are the first line of defense, the air marshals are the last. If everything else fails and a terrorist still gets onto a flight with a weapon, an armed air marshal can take control of a situation and restrain the attackers. Although the air marshal program has existed since the 1970s, it has never had as high of a profile as it has in the post-9/11 era. An air marshal is a federal agent disguised to look like regular passenger. Each air marshal is authorized to carry a gun and make arrests. There are not enough air marshals to cover every flight, so their assignments are kept secret. No one knows which passenger is the air marshal, or even if an air marshal is present on the flight at all. Although their exact numbers are kept classified, airline insiders estimate that only five percent of U.S. flights have an air marshal on board. This is still a major increase - in the years before 9/11, a handful of marshals guarded just a few international flights. In addition to policing the sky, new laws have forced the

installation of locks on cockpit doors. This could prevent hijackings by terrorists who are trained to fly passenger jets by keeping them away from the plane's controls.

CHECK YOUR BAGS: X-RAY SYSTEMS

Your luggage goes through a larger X-ray system. In addition to passenger baggage, most planes carry enormous amounts of cargo. All of this cargo has to be checked before it is loaded. Most airports use one of three systems to do this: Medium X-ray systems - these are fixed systems that can scan an entire pallet of cargo for suspicious items.



Mobile X-ray systems - a large truck carries a complete X-ray scanning system. The truck drives very slowly beside another, stopped truck to scan the entire contents of that truck for suspicious items. Fixed-site systems - this is an entire building that is basically one huge X-ray scanner. A tractor-trailer is pulled into the building and the entire truck is scanned at one time.

In some airports, medium X-ray facilities are set up to scan an entire pallet of luggage at a time.

One old-fashioned method of bomb detection still works as well or better than most hi-tech systems - the use of trained dogs. These special dogs, called K-9 units, have been trained to sniff out the specific odors emitted by chemicals that are used to make bombs, as well the odors of other items such as drugs. Incredibly fast and accurate, a K-9 barks at a suspicious bag or package, alerting the human companion that this item needs to be investigated. In addition to an X-ray system, many airports also use larger scanners.

STEP THROUGH, PLEASE: METAL DETECTOR



Airport metal detectors rely on pulse induction. All public access to an airport is channeled through the terminal, where every person must walk through a metal detector and all items must go through an X-ray machine.

Almost all airport metal detectors are based on pulse induction (PI). Typical PI systems use a coil of wire on one side of the arch as the transmitter and receiver. This technology sends powerful, short bursts (pulses) of current through the coil of wire. Each pulse generates a brief magnetic field. When the pulse ends, the magnetic field reverses polarity and collapses very suddenly, resulting in a sharp electrical spike. This spike lasts a few microseconds (millionths of a second) and causes another current to run through the coil. This subsequent current is called the reflected pulse and lasts only

about 30 microseconds. Another pulse is then sent and the process repeats. A typical PI-based metal detector sends about 100 pulses per second, but the number can vary greatly based on the manufacturer and model, ranging from about 25 pulses per second to over 1,000. If a metal object passes through the metal detector, the pulse creates an opposite magnetic field in the object. When the pulse's magnetic field collapses, causing the reflected pulse, the magnetic field of the object makes it take longer for the reflected pulse to completely disappear. This process works something like echoes: If you yell in a room with only a few hard surfaces, you probably hear only a very brief echo, or you may not hear one at all. But if you yell into a room with a lot of hard surfaces, the echo lasts longer. In a PI metal detector, the magnetic fields from target objects add their "echo" to the reflected pulse, making it last a fraction longer than it would without them. A sampling circuit in the metal detector is set to monitor the length of the reflected pulse. By comparing it to the expected length, the circuit can determine if another magnetic field has caused the reflected pulse to take longer to decay. If the decay of the reflected pulse takes more than a few microseconds longer than normal, there is probably a metal object interfering with it.

Express your opinion to the following statements:

1. If fences and barriers are the first line of defense, the air marshals are the last.
2. All cargo has to be checked before it is loaded.
3. Almost all airport metal detectors are based on pulse induction (PI).

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