The textbook follows content and language integrated approach and communicative syllabus based on functions and integrated language skills (reading, vocabulary, grammar, translation) with different opportunities for practicing speaking and writing through specific tasks, assignments and discussion points. As activities and language skills in each of the thematic units indicate, the priority in this textbook is given to fluency and practice of using language in different contexts that are essential for the highly sensitive role that aviation English plays in people's everyday life and domain-specific contexts, including the context during the COVID-19 pandemic. The strength of this textbook is in the integrative approach through the use of specific tasks and assignments that ties together all language skills, including grammar and vocabulary, so that language skills are not dealt with in isolation from each other.

Larisa Kasumagić-Kafedžić, Associate Professor
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Kalajdžisalihović and Naumoska have shared with us much of their aviation English knowledge and teaching experience. Their effort to generate this textbook and make personal contributions to the aviation industry and its culture is noble and brave. Noble, because it is an interesting, contemporary, and useful source of information and activities which can be utilized for various purposes in teaching and learning aviation English. Brave, because compiling this textbook is a massive task which may have required a large team of experts. The authors have embraced the challenges and produced a valuable resource which deserves to be published and utilized in instruction.

Ervin Kovačević, Associate Professor,
International University of Sarajevo

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ENGLISH IN AVIATION

Nejla Kalajdžisalihović ◆ Aneta Naumoska

ENGLISH IN AVIATION

— A CONTENT AND LANGUAGE INTEGRATED APPROACH

Nejla Kalajdžisalihović ◆ Aneta Naumoska

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—A Content and Language Integrated Approach

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FOREWORD

This textbook is primarily intended for upper-intermediate and advanced students of English studying at departments of air traffic, as well as for instructors and researchers interested in English for Specific Purposes (ESP) and contemporary English, whereas a special emphasis has been given to relevant contemporary content and context during the COVID-19 pandemic.

The sequence of reading and other tasks is given in such a way as not to burden students and readers with grammar which is taught in correlation with content and integrated into the chosen writing tasks topics and also related to the content of sample materials collected from various educational, instructional, safety knowledge and public domain sources. It is important to mention that grammatical and rhetorical points have been selected also on the basis of current trends and rapid changes in the aviation industry.

The authors would like to thank prof. dr. Larisa Kasumagić-Kafedžić and prof. dr. Ervin Kovačević, students and subject matter experts for inspiring them in the process of finding and responding to texts that will be interesting and motivating for studying both grammar and vocabulary of English as a foreign language within this domain-specific approach and framework that may also be used across contemporary English language courses at the university level.

Sarajevo, 2022
Nejla Kalajdžisalihović

Skopje, 2022
Aneta Naumoska

INTRODUCTION

In order to introduce the reader/learner to the concept of a content and language integrated approach and in line with the discussions and units that follow, it is important to mention that in numerous case studies published on ESL and EFL teaching, a distinction is often made between *subject matter knowledge* and *pedagogical knowledge*.

In the case of English for aviation, it should be emphasized that teacher subject matter and safety knowledge may help students achieve better results because teachers' understanding of the subject matter affects the quality of their instructions and the ways they transform their knowledge of the subject matter and language of instruction into forms comprehensible to students (Tsui, 2003).

Among a number of studies conducted on how subject matter knowledge affects the process of teaching, this textbook exploits concepts proposed by Shulman (1987) allowing both lecturers and students to assess their subject matter knowledge in an educational context in which content of the subject matter is discussed in a foreign language which is, in this particular case, English—*lingua franca* or *default language* in the world of aviation.

1 — CAREER IN AVIATION; NUMBERS AND THE ALPHABET

1.1. Pre-reading

Skim the text below. What prior knowledge do you have about the requirements to become a pilot?

1.2. Reading and vocabulary: *A career in the aviation industry*

Read the text below before answering the questions:

The best possible training for the pilot of the air are outdoor sports and games. Football, which teaches the person to keep their head in all emergencies, to keep their feelings always well under control, and to learn to implicitly obey the discipline of the referee's whistle will prove invaluable to them when learning to fly, when they will be subject to every kind and manner of unexpected and sudden mishap and accident.

Cricket will teach them patience, judgment—so invaluable when landing an aeroplane (which, incidentally, is by far the most difficult feat to accomplish in flying)—and a steady eye. Swimming and running will develop those muscles of the back and thigh which are used extensively in the pilotage of the aeroplanes.

Again, the sensation of a horse jumping a hedge is exactly similar to that of an aeroplane just getting off from the ground. With skiing, on the other hand, there is the feeling (and in fact the action) of plunging desperately into what, at the first attempt, appears to be an interminable and awful space. This is exactly the feeling experienced by the novice in their first trip up aloft. There is a strong similarity to skiing at the moment when the nose of the machine is suddenly put down, and she commences to sink rapidly towards the earth.

The next matter to be taken into consideration is that of physical peculiarities. The would-be pilot must be neither too tall nor too short: essentially a matter to do with the steering of the aeroplane. If they are too tall, they will

find themselves very cramped in the confined space between the pilot-seat and the rudder-bar. If they are too short, they will discover that their legs will not be long enough to reach that all-important adjunct.

Again, with regard to weight, for preference they should be on the light side. There is not very much room in an aeroplane, and for reasons which we will deal with, the machine is only capable of lifting up to a certain weight.

Furthermore, they must be possessed of good health. They must not suffer from heart trouble. It has been proved by several very eminent doctors that the rise and descent through the various altitudes of the atmosphere affect the heart greatly. Yet again, they must have good eyesight, and this is imperative, for the best part of their work will take place at an altitude of ten thousand feet above the earth. The best age for an air pilot is between nineteen and twenty-four (Middleton, 1917, ad.).

Discussion

1. How did you feel while reading the text? Are there any nouns or phrases in the excerpt above that are no longer used in aviation English?
2. Which parts of the excerpt would be difficult to translate into your L1?
3. Do you think this text could be adapted for the contemporary reader? How?
4. Have you read similar texts about the requirements necessary to become a pilot?
5. What do you know about language requirements necessary if you want to work in the aviation industry?

Assignment

In 250-300 words, elaborate on one of the two topics:

1. It is very difficult to work in the aviation industry. Explain and illustrate.
2. There are more advantages than disadvantages if you want to become a pilot.

1.3. Grammar focus: numbers and the alphabet

Working in the aviation industry requires proficiency when it comes to the usage and correct pronunciation of numbers and the alphabet. In March 1956, the International Civil Aviation Organization (ICAO) adopted a standard phonetic alphabet for aviation:

Alpha, Bravo, Charlie, Delta, Echo, Foxtrot, Golf, Hotel, India, Juliet, Kilo, Lima, Mike, November, Oscar, Papa, Quebec, Romeo, Sierra, Tango, Uniform, Victor, Whiskey, X-ray, Yankee, Zulu

Numbers are pronounced as in general English. However, to avoid confusion, there are several exceptions: number three (3) is pronounced "tree", number five (5) is pronounced "fife", and number nine (9) is pronounced "niner".

Furthermore, numbers are regularly used to refer to speed, fuel quantity, persons on board, weather information, giving information about passengers or cargo. ICAO phonetic numbers have to be memorized so you need to practice the pronunciation slowly and clearly:

NUMBER	PRONUNCIATION
0 Zero	Ze ro
1 One	Wun
2 Two	Too
3 Three	Tree
4 Four	Fow er
5 Five	Fife
6 Six	Six
7 Seven	Sev en
8 Eight	Ate
9 Nine	Nin er
10 Ten	Ten
Hundred	Hundred
Thousand	Tau sand

What is also interesting to mention is that we refer to "persons on board", whereas in aviation English, another expression is also used: "souls on board". Why do you think this might be the case and what is the origin of this phrase? What about "men on board" and "people on board"? Are these phrases also used by Air Traffic Control (ATC)?

1.4. Practice and revision

1. Complete the text by filling in the gaps with an appropriate word or words:

term / terminology / flight / souls on board / controller

ATC: 4194 Say _____. (This is the ATC _____ for asking how many people are in the plane. It is the standard terminology, and when you file any _____ plan, that's the _____ for number of people on the plane; but when you hear it said out loud by a _____ it's usually a bad sign. It fills me with dread.)

2. Read out the following lines and pay special attention to numbers:

ATC 1: Denver Centre, Cirrus 435 Sierra Romeo, 6,000

ATC 2: 35 Sierra Romeo, Denver Centre, Denver altimeter 3009

ATC 3: A wind coming from the west would be a wind direction of 270°

Note down any difficulties you had while reading:

1.5. Translation

Translate the following excerpts into your L1:

Excerpt 1. *Routine and non-routine communication*

In international contexts, pilots and air traffic controllers communicate in aviation English on the radio. This communication is made through a highly specialized language, Aeronautical Phraseology, mandated by ICAO (International Civil Aviation Organization), employing unique terms, pronunciation, grammar, and organization that are different from everyday English used by speakers of various first languages. However, in non-routine situations such as an engine failure or a bird strike, pilots and controllers also use plain English that is similar to spontaneous everyday English for more complex interactions (Ishihara & Prado, 2021) (word count: 84).

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Excerpt 2. *Becoming a professional in the aviation industry*

In order to use the potentials that a correct implementation of international aviation-specific knowledges offers, it is necessary to start with solving all the barriers at once as they could be compared to a system of "connected vessels". What is encouraging is the fact that there are numerous young and highly-motivated people who cherish their passion for air traffic and who could, through education and academic supervision by international experts, soon become professionals competitive on the market. Such professionals could contribute to the existing infrastructure in order to establish a sustainable model of air traffic, regardless of airline carriers or one of our international airports (IGES, 2021) (word count: 105).

2 — COMMERCIAL OR CARGO; COMPARING AND CONTRASTING

2.1. Pre-reading

Skim the text below. What prior knowledge do you have about decision-making in the aviation industry?

2.2. Reading and vocabulary: *Judgement and decision-making*

Read the text below written in 1916 before answering the questions:

There is a need in flying for a sound judgement, one that will enable a man to come to a decision quickly and yet accurately. Things happen rapidly in the air. It is one of the grim aspects of flying that, just at a moment everything appears secure, a sudden disaster may threaten. So, it is of vast importance to a pilot, if he has to fly regularly, that he should have an instinctive and dependable judgement; a capacity for deciding quickly and without panic; a capacity, when several ways present themselves of extricating himself from some quandary, of being able to choose the right one, and of not having to think long before doing so. This implies a combination really of judgement and resource. The man of confidence, the man of resource, is well endowed for flying. But he must not be over-confident. The over-confident man is a menace to himself and to others. It is not a proper spirit at all in which to approach aviation. We do not know enough about navigation of the air to be in the least over-confident. The spirit, rather, should be one of humility — a determination to proceed warily, and to make very certain of what limited knowledge we possess.

Two of the worst traits in an aviator are impatience and irritability. A man who has these temperamental drawbacks in a form which is strongly marked, and who cannot control them, should not think of becoming an aviator. The man who is impatient and irritable finds himself out of harmony with the whole theory of aerial navigation. There is a long list of "don't" in flying; the handling of one's machine, in the weather one flies in, in all the feats that one should attempt and leave alone. A number of details must

be memorized, and must never be forgotten or overlooked, trivial though some of them may seem. The frame of mind of the man who flies must be alert, yet quiet and reposeful; he must be clear-headed, not hot-headed. The man who is in a hurry, who ignores details when he sets out on a flight, is the man who runs risks and is bound sooner or later to pay the penalty. The perils of recklessness in flying are very great (Grahame-White & Harper, 1916).

Discussion

1. How did you feel while reading this text? Is this text instructional? Why?
2. Is there anything that has changed about the usage of pronouns from the period the text was written until the present?
3. Are the qualities mentioned as required for an aviator the same or different for military, commercial and cargo aircraft?
4. List at least five differences between flying a cargo and commercial aircraft.
5. In your opinion, what skills are crucial in the cargo industry?

Assignment

In 250-300 words, elaborate on one of the two topics:

1. Commercial and cargo aircraft are different in many aspects. Explain and illustrate.
2. There are more advantages than disadvantages if you want to become a cargo pilot. Use the following words to help you: *dangerous goods*, *hassle*, *night time*, *flight attendants*, *changes in economy*, *roster*, *social life*.

2.3. Grammar focus: comparing and contrasting— adjectives

In the text above, there are many adjectives used. List five adjectives from the text and provide their comparative and superlative forms:

positive	comparative	superlative
strong	*stronger*	*the strongest*
gifted	*more gifted*	*the most gifted*

Based on the examples above, could you come up with a rule on how comparatives and superlatives are formed in the English language?

In the English language, most adjectives are *gradable*. There are three degrees of comparison: *positive* degree, *comparative* degree and *superlative* degree. The comparison may indicate *equality*, *inequality*, *superiority* and *inferiority* (Šestić, 2002, p.144).

What is important to mention is that, when we wish to indicate that two individuals or phenomena or items possess the same quality to a similar or identical degree, we may also use the construction *as … as* to mark the equality. For example, we may say that *The O'Hare Airport is as busy as Heathrow*.

As for inferiority, if we wish to indicate a lesser degree of a certain quality, we may use the word *less* for the comparative and *the least* for the superlative before the adjective and say that, for instance: *The O'Hare Airport is less interesting than Heathrow* or that *The O'Hare Airport is the least interesting airport*.

Furthermore, several adjectives in the English language have irregular comparative and superlative forms (e.g., *bad — worse — the worst*, *far — farther/further — the farthest/the furthest*; *good — better — the best*; *little — less/lesser — the least*; *much/many — more — the most*).

Some adjectives describe qualities that are "completely present" or "completely absent". These are non-gradable adjectives and usually cannot be used in their comparative and superlative forms (e.g., a *frozen* ATPL cannot be **more frozen* or **the most frozen*). Some other examples of non-gradable adjectives are: *nuclear, dead, perfect, round, unique*.

2.4. Practice and revision

1. Complete the text below by choosing the correct answer:

By choosing a moduled/modular commercial pilot licence (CPL(A)) program, you can divide your studies into modules. In this course, a Private Pilot Licence (PPL(A)) comes first and then you proceed with ATPL theory course. The second option is to choose an integrated/integrational ATPL(A) program to obtain a freezing/frozen ATPL. This program is intensive/intensifying and, as a result, a fast/fastening way to start your Type Rating. However, obtaining a pilot cadet program with an airline is a secure/secured way of completing your training. It is the same ATPL integrated training program for a pilot's licence except that the main benefit of it is a conditional/unconditional employment guarantee from the airline before even starting the training. (BAA Training, 2018, word count: 111)

2. Read out the following acronyms and check your pronunciation:

ICAO (International Civil Aviation Organization)
CPL (Commercial Pilot License)
PPL (Private Pilot License)
ATPL (Airline Transport Pilot License)
TT (Total (Flight)Time)
FO (First Officer)

3. For more abbreviations and acronyms, see Appendix.

2.5. Translation

Translate the following excerpt into your L1:

Excerpt 3. *Flying hours*

While each airline has its own specific requirements, flying for a major cargo carrier legally requires the exact same flight time as flying for a passenger-carrying airline. This number depends on the specific airline. For example, the world's largest courier service company, DHL, prefers candidates for their FO position with a professional flight experience with no less than 1,000 hours. Another global logistics company, UPS, mandates at least 1,500 hours of total fixed-wing pilot time to become a FO. According to the pilot job offers posted on pilotjobs.io, the preference of required total flight time (TT) varies among different airlines. Some of them prefer candidates with 2,500 hours of TT, while others choose candidates having 1,500-2,000 hours of TT. Totally different requirements are applied to a cargo captain's position. There you have to obtain at least 5,000 hours of TT and 500 hours of pilot in command. As you might have realized, there is a lot of flight hours to accumulate, even when you operate the aircraft filled with boxes, not passengers (BAA Training, 2019) (word count: 172).

2.6. Vocabulary

If you compare two things, you tell how they are alike. If you contrast two things, you tell how they are different. If you compare and contrast two things, you tell how they are alike and how they are different. It is important to organize your thoughts and information before you speak or write. Below are some useful conjunctions that can help you organize your ideas more efficiently. They are used to connect the text as a whole, i.e., for coherence. Below are some conjunctions and expressions that can help you organize your ideas more efficiently:

in the same way	likewise
another similarity	similarly
whereas	too
while	both
however	also
on the one hand	on the other hand
additionally	although
because	before
finally	as well as

3—FIGHTING THE PANDEMIC; EXPRESSING PURPOSE, GIVING DIRECTIONS, ORDERS AND REQUESTS

3.1. Pre-reading

Skim the text below. What prior knowledge do you have about quarantine-related measures before boarding a plane?

3.2. Reading and vocabulary: International travel and quarantine measures

Read the text below before answering the questions:

The International Air Transport Association (IATA) called for the development and deployment of rapid, accurate, affordable, easy-to-operate, scalable and systematic COVID-19 testing for all passengers before departure as an alternative to quarantine measures in order to re-establish global air connectivity. IATA will work through the International Civil Aviation Organization (ICAO) and with health authorities to implement this solution quickly. International travel is down 92% on 2019 levels. Over half a year has passed since global connectivity was destroyed as countries closed their borders to fight COVID-19. Some governments have cautiously reopened borders since then, but there has been limited uptake because either quarantine measures make travel impractical or the frequent changes in COVID-19 measures make planning impossible.

The SpectraLIT test, which eliminates the need for swabbing and lab processing, works on a self-service basis, with passengers simply asked to gargle with ten millilitres of a special mouthwash, and then spit into a tube. In the initial pilot phase, a passenger who tests positive will then be sent for a standard swab test. Meanwhile, Lufthansa plans to begin offering rapid COVID-19 tests to passengers in October. Testing centres would likely be established at Lufthansa's primary hubs, such as Frankfurt and Munich but also at key airports in the US and Canada. (EX YU Aviation, 2020, ad.) (word count: 210).

Discussion

Do the necessary research to answer the following questions:

1. What steps did IATA suggest in order to re-establish global air connectivity?
2. Which organizations will IATA work with in order to implement some quick solutions?
3. What is the reason countries across the world closed their borders at one point?
4. What measures are going to restore confidence of governments to reopen their borders?
5. What is the purpose of establishing testing centres at primary hubs?

Assignment

In 250-300 words, elaborate on one of the two topics:

1. Major changes after the COVID-19 pandemic in the aviation industry.
2. Measures that have been implemented to fight COVID-19 and to restore air travel in the future.

3.3. Grammar focus: Expressing purpose, giving instructions and issuing orders

In the English language, there are different ways of expressing purpose. Another word that can help you understand the word 'purpose' in this context is an 'intention' or 'goal', i.e., something that is to be achieved in the future. The most common expressions used in the text above were activated through the answers to the discussion questions.

For instance, conjunctions that can be used for expressing purpose instead of 'to + infinitive' are: *in order that, so (that), in order to, for the purpose of, with the aim of, with the objective of, with the intention of, for the purpose of*.

When it comes to giving instructions and issuing orders in general English for aviation, we may find a broad range of strong collocations (combinations of two or more words that usually occur together; see Chapter 13) featuring the following verbs: *access, contact, declare, do, follow, keep, lock, request* (Emery & Roberts, 2008, p. 30). In the chapters that follow, there will be more exercises related to collocations. As a general introduction to this topic, it is important to mention that collocations are more challenging to acquire than conjunctions, for instance. Some examples that will be presented in the exercises that follow will help you understand the relationship between collocations and language used for giving instructions and issuing orders.

Imperative in condensed technical English is also common as are the fixed expressions such as: *Pass your message.*, now used instead of *Go ahead.* in order to avoid miscommunication as *Go ahead.* may be understood as 'proceed with moving ahead', which may cause an accident on the runway.

3.4. Practice and revision

1. Complete the sentences below. Use a conjunction for expressing purpose:

in order that, so (that), in order to, for the purpose of, with the aim of, with the objective of, with the intention of, for the purpose of

1. The Aviation Public Health Initiative team at Harvard recommended strategies _____ mitigate transmission risk on aircraft, during boarding and exiting.
2. Airlines have mandated masks, added new cleaning and implemented protocols _____ manage boarding and deplaning.
3. Have your passport open and scan your boarding pass _____ limiting your contact.
4. In the absence of federal mask regulations, many flight attendants felt there was little they could do _____ ensure compliance, or protect themselves against backlash and aggression.
5. Research is being done _____ of discovering ways to fight the pandemic.

2. Complete the instructions/orders below using the most appropriate collocation:

1. require	assistance
2. contact	an emergency
3. do	the exits clear
4. declare	information
5. access	ATC
6. keep	the instructions
7. request	cross-check doors
8. lock	clearance
9. shut	down the engine
10. follow	the inspection

3.5. Translation

Translate the following excerpt into your L1:

Excerpt 4. *Reusing masks?*

Mask usage is an effective measure to prevent severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) infection; however, mask reuse is not recommended. Studies examining the factors associated with mask reuse during the coronavirus disease (COVID-19) pandemic are limited. This nationwide survey aimed to determine the prevalence and factors associated with mask reuse among Taiwanese citizens during the pandemic. From 18 May through 31 May 2020, a computer-assisted telephone interview system was used to randomly select Taiwanese citizens for interview regarding COVID-19-preventive behaviors and knowledge on mask usage. For a total of 1075 participants, the overall mean age was 57.4 years, and 82.2% of participants reported mask reuse during the COVID-19 pandemic. After controlling for other covariates, participants who had a greater knowledge of mask usage or had a high supply of masks were less likely to reuse masks during the pandemic. Moreover, generalized estimating equations (GEE) analysis showed that, compared with the participants' mask-wearing behaviors before the COVID-19 pandemic, they were more likely to reuse masks during the pandemic. Thus, it is imperative to educate people on the correct usage of masks. Furthermore, the government should provide sufficient masks to the general population to reduce mask reuse (Cheng et al., 2021) (word count: 197).

3.6. Vocabulary and grammar —expressing purpose

For more practice when it comes to expressing purpose in the English language, observe the following constructions:

- **for + verb + ing**
  Headphones are used for listening to instructions by the ATC.
  Your own example: _____
- **to + infinitive**

  They had to inspect the engine to complete the check.

  Your own example: _____
- **for + noun**
  I went to the galley for more water.
  Your own example: _____

4—HUMAN PERFORMANCE; EXPRESSING CAUSE AND EFFECT, GIVING SUGGESTIONS, EMERGENCY SITUATIONS

4.1. Pre-reading

Skim the text below. What prior knowledge do you have about causes of flight diversion?

4.2. Reading and vocabulary: *Diverting a flight*

Read the text below before answering the questions:

Every flight plan is carefully checked and rechecked by aircraft dispatchers, pilots, and flight controllers. In fact, flight plans are so thoroughly thought out that there are backup plans just in case a flight needs to be diverted. Aircraft dispatcher training prepares dispatchers to deal with expected and unexpected diversions from the planning phase and on. When and why would aircraft dispatchers divert flights? The most common reason aircraft dispatchers divert flights is in response to weather conditions.

Weather monitoring is a major part of the day-to-day lives of aircraft dispatchers. Aircraft dispatcher training focuses heavily on monitoring and predicting weather systems effectively. The weather is constantly changing, and even a meteorologist's predictions are incorrect from time to time. If a thunderstorm develops or a snow storm changes direction, aircraft dispatchers divert flights to maintain the safety of everyone on board.

Unfortunately, an unruly passenger can cause delays. Although aircraft dispatchers divert flights more so for weather, it is not uncommon for some flights to be grounded or diverted to land sooner because of passengers.

Nearly one third of passenger-related issues are due to alcohol consumption. Aircraft dispatcher training does not have to cover the "how to deal with unruly passengers" part because that is handled by the flight crew. The flight captain then has the final say. Some aircraft dispatchers divert

flights at the request of the captain if there has been a medical emergency. Over the decades, there have been instances of babies being born mid-flight, passengers experiencing heart attacks and strokes, or other emergency health issues. The flight captain will usually consult with a medical professional and make the decision to divert the flight (Morris, 2019, ad.) (word count: 277).

Discussion

1. What are the most common causes for a flight to be diverted?
2. What are some of the effects of the decision to divert a flight?
3. Is there a special training for dealing with flight diversions?
4. Are diversions usually planned before take-off?
5. What medical conditions may cause flight diversions to be initiated?

Assignment

In 250-300 words, elaborate on one of the two topics:

1. Causes of flight delays.
2. Effects of flight diversions on schedule disruptions.

4.3. Grammar focus—Expressing cause and effect, giving suggestions, emergency situations

In order to understand the cause-effect relationship, we need to distinguish between cause and effect. To identify causes, ask "why did something happen" or "why something happens". To identify effects, ask "what happened because of something" or "what happens because of something".

The transition words and conjunctions that can be used when talking about causes are: *because*, *due to*, *since*, *for*, *first*, *second*, etc. For effects, the following words can be used: *consequently*, *as a result*, *thus*, *therefore*, *hence*, *since*. These transition words can be used in both oral presentations and written assignments.

In this chapter, we can refer to medical emergencies to illustrate the cause-and-effect relationship. For instance, we can talk about causes of feeling unwell on a flight. Some causes can be related to the passenger's activities before the flight, e.g., decompression sickness. The effects of decompression sickness on a flight may vary and the flight may also be diverted. Therefore, a single cause may result in several effects, or many causes may create a single effect (see: Smalley, R. L., Ruetten, M. K., Kozyrev, J. R. 2001, p. 238-260).

It is crucial to act accordingly in emergency situations, understand their causes and effects, and use standard phraseology for emergency situations. As emergency situations are usually discussed immediately after they happen, it is important to revise the usage of the *Present Perfect Tense* and phrases used for identifying the problem, offering suggestions and finding the solution. The verbs and expressions commonly used for offering assistance and suggestions are: *try (and…)*, *it can help if …*, *it could help if...*, *you may want to…*, *you should…*, *you shouldn't….*, *I suggest that you…*, etc.

4.4. Practice and revision

1. Complete the sentences about the first-aid kit. Use one of the verbs provided below:

keep (x4) / check / use / go / learn / make / replace

1. _____ the expiry date of all your medicines frequently. NEVER
2. _____an expired product.
3. _____through the kit once every three months and
4. _____ products if needed. Always
5. _____a list of emergency phone numbers in the first-aid kit.
6. _____ compartments in your kit.
7. _____medicines and bandages separately.
8. _____ how to administer CPR and basic first aid.
9. Try to _____ your kit small and simple.
10. ____ wound supplies in one bag and medications in another.

4.5. Translation

Translate the following excerpt into your L1:

Excerpt 5. *Human performance in aviation*

Modelling human performance in aviation actually was initiated in the 1950s — not by human factors professionals (of which there were only a few at the time) or psychologists, but rather by aerodynamicists and control engineers. Duane McRuer was very interested in aircraft handling qualities. He pioneered recasting the dynamics of flight traditionally expressed in partial differential equations into control engineering transfer function terms. But there was one problem. Without a transfer function for the human pilot, there could be no analyses of the complete aircraft control loop. He therefore set about to explore the control engineering representation for what came to be called "manual control" — a model of the dynamical response of the human controller.

While there was much human factors research in the aviation world, manual control was the dominant research thrust to human performance modelling in aviation. Beginning in the late 1980s, discrete event simulation, computer-based information processing models a la Newell and Simon, and, eventually, cognitive architectures gradually took over (Foyle & Hooey, 2008) (word count: 163).

_____
_____
_____
_____
_____
_____
_____

4.6. Vocabulary

Check the meaning of the following words in a dictionary:

bandage, gauze roll, ointment, antiseptic solution, thermometer, scissors, sting relief pad, band-aid, splinter, safety pin, phone card, charger, mosquito repellent, energy bar

sprain, strain, burn, fracture, head injury, trauma, contamination, early labour, premature childbirth, cardiac arrest, epilepsy, heart attack, panic attack, arrythmia, blood pressure,

severe headache, nausea, clot, convulsion, asthma attack, allergic reaction, rash

5 — WEATHER WORDS; NAVIGATION AND METEOROLOGY, DESCRIBING TOPOGRAPHICAL FEATURES

5.1. Pre-reading

Skim the text below. What prior knowledge do you have about the invention of the radar?

5.2. Reading and vocabulary: *The advancement of the radar*

Read the text below before answering the questions:

Since the 1930s, British scientists had been working on ground-based radar techniques. The very long wavelengths they employed combined with very broad beams made them difficult to use and provided very little directional accuracy. By 1940, the invention of the magnetron had provided a technique for creating very short wavelengths. Sir Henry Tizard, a prominent British physicist, showed his colleagues in the US and Canada how the magnetron could enhance the usefulness of radar as the race to create a military tool that would allow Allied forces to "see" incoming ships and aircraft intensified. The scientists at the MIT's Radiation Lab, impressed with the potential of the magnetron, adopted its use in their radar development program and were soon working on building microwave radar. These shorter wavelengths allowed users to locate their own and enemy combat forces with much greater accuracy, but microwave radars had their own set of problems. Whereas old radars had been able to "look through" rain and snow, the new microwave radars returned images of rain and snow that masked the presence of ships and aircraft.

On February 20, 1941, a radar team tracked a rain shower some 2.5 miles off the English coast—the first confirmed use of "weather radar." Hearing this news, wartime meteorologists were quick to exploit the use of microwave radar to track storms, especially those that could be hazardous to ships and

aircraft. Although the principal efforts in radar advancement during the war were aimed at locating enemy assets, work continued on radar specifically designed for weather forecasting purposes. The British Meteorological Office established a radar research site near London before the end of the war, and the Canadian Army Operational Research Group carried out Project Stormy Weather in 1944, making time-lapse photographs of radar returns to study storm movement (Harper, 2007, ad.) (word count: 299).

Discussion

1. Summarize the main idea of the text.
2. According to the text, what is the first confirmed case of "weather radar"?
3. What was the MIT's Weather Radar Project concerned with?
4. Which inventions helped in developing more sophisticated radars?
5. Which types of radars are mentioned in the text? How do they work?

Assignment

In 250-300 words, elaborate on one of the two topics:

1. The relationship between aviation, meteorology and climatology.
2. Key inventions in navigation, meteorology and climatology.

5.3. Grammar focus— Describing topographical features, weather conditions and issuing warnings

Descriptive language uses sensory details to describe a place, a person, an object, etc. In descriptive written or oral messages, you need to pay attention to detail. As for cohesion and coherence, you may use *adverbs of place* to describe topographical features in VFR conditions, e.g., *on your left, opposite the river, along the river, on the righthand side, on the left-hand side*, etc. In addition, activating *Present Continuous Tense* may also be important, as can be seen from the following sentences provided as an illustration: *The road is crossing the river, I'm leaving the valley.* The construction *there is/there are* is also useful and can be activated when describing both topographical features and weather conditions, as in: *There is a microburst 5 miles north-east*.

As for weather reports, they are extremely important for pilots and air traffic controllers. Furthermore, in cases of changing weather conditions, the following expressions may be used for warnings: *watch out for, look out for, be careful of, be prepared to, prepare for, listen carefully, beware of, be on alert for* (see Emery & Roberts, 2008, p. 86).

5.4. Practice and revision

1. Complete the table below with dictionary definitions and translation equivalents for the following weather words:

WORD	DEFINITION	TRANSLATION
microburst		
macroburst		
wind shear		
de-icing		
hailstorm		
thunderstorm		
lightning		
thunder		
drizzle		
heavy rain		
cyclone		
cumuliform clouds		
stratiform clouds		
ice crystals		
funnel cloud		
single cell		
vortex		
turbulence		
tail-end Charlie		
dew point		
intra-cloud lightning		
halo		
dust devils		
mist		

5.5. Translation

Translate the following excerpt into your L1:

Excerpt 6. *Inventions in the aviation industry*

Sir George Cayley invented many things throughout his life, most of which are still used today. Not only did he invent the first glider to carry a human, but he also created the first ever artificial limb. It was made for the son of one of his tenants who tragically lost his hand in an accident at the mill. This revolutionized the concept of prosthetics as it could move and manipulate objects. Vivian Bairstow, life member of Brompton Local History Group, said:

"Locally he was a philanthropist; he liked to look after his tenants. He did an awful lot of good, not just in the village but nationally. He was just light-years ahead of other people's thinking and I think he stands head and shoulders above so many others with his inventions, which were very often driven by accidents that had happened and his way of correcting them and helping people who may have suffered".

In 1809 Cayley published a 3-part paper which shared the principles of aerodynamics, everyone around the world in aviation recognizes this as the document on how to fly. The defining moment when something happened was in 1853, when the world's first man carrying a glider successfully flew across Brompton Dale. At the age of 79, Sir George Cayley had changed history.

Cayley has a lasting legacy across North Yorkshire with his glider considered to be the first real aeroplane in history and since the break-through further engineers and scientists have continued to develop his work. He is acknowledged by The Wright Brothers, who invented the first engine-powered flight in 1903, as the man who had taken aviation forward better than anyone else (Gibbs-Smith, 1962) (word count: 277).

5.6. Vocabulary

List the words from the text above you were not familiar with and provide their translation equivalents

6 — CRITICAL PHASES OF FLIGHT; TAKE-OFF AND LANDING, VERBS OF MOVEMENT

6.1. Pre-reading

Skim the text below. What prior knowledge do you have about critical phases of flight?

6.2. Reading and vocabulary: *Accident investigation*

Read the text below and answer the questions:

Korean investigators believe the crew of an Airbus A321 were distracted by a perceived landing gear problem before the aircraft landed on the wrong runway at Busan's Gimhae airport. Operated by Air Busan, flight BX8108 had been cleared to perform a circling approach to runway 18R, following its service from Jeju on 8 May 2012. This approach required aligning with the localiser for the opposite-direction runway 36L, then breaking off to the west and making a 180º right turn to land. Gimhae's parallel runways are separated by just 210 m (690 ft). The crew of the aircraft (HL 7761) received a landing-gear control interface unit fault indication just above 11,000 ft (3,350 m), about 20 min from landing.

Although the pilots carried out the necessary checklist procedures, the Korean accident investigation board ARAIB says they had "continuing doubt" about the situation. Gimhae tower instructed the aircraft to make the circling approach to runway 18R, and the aircraft entered the circling turn at about 1,300 ft. The tower controller could not see the A321 and told the crew to "check wheels down", before clearing it to land on 18R. The aircraft descended continually, but upon exiting the turn, lined up with runway 18L. In its analysis of the event the ARAIB mentions the phenomenon of "tunnel vision". The pilots did not distinguish the correct runway and landed on 18L. The ARAIB says the monitoring pilot did not maintain an adequate check on the aircraft's flight path. Surface detection radar surveillance showed two vehicles at the far end of the runway at the time (*Flight International*, 2013) (word count: 262).

Discussion

1. Summarize the main idea of the text.
2. According to the text, what was the instruction given to flight BX8108?
3. How would you translate *continuing doubt* in your L1?
4. How would you define *tunnel vision*?
5. What examples of landing-gear problems do you know of?

Assignment
In 250-300 words, elaborate on one of the two topics:

1. Take-off and landing as critical phases of flight.
2. "Sarajevo approach" or another interesting approach.

6.3. Grammar focus: verbs of movement

Verbs describing actions and positions are frequent in aviation English. Some verbs that are used describe slow movement, e.g., *push back*. In the case of this verb, a tow truck pushes the aircraft. Other verbs describe fast movement, e.g., *roll for take-off*. It is also interesting to mention that Emery & Roberts (2008, p. 15) list *approach* as a slow-movement verb, and *touch down* as a fast-movement verb.

When it comes to verbs describing no movement, the most frequently used verbs are *face*, *wait* and *queue*. For each of the verbs describing movement, use grammar books and online dictionaries to check if the verbs are transitive or intransitive.

In the cases of all the above-mentioned verbs, i.e., verbs describing no movement, verbs describing slow movement or verbs describing fast movement, it is useful to revise the usage of *Present Continuous Tense* (e.g., *The aircraft is facing the apron.*). Some verbs of movement are usually followed by a preposition, e.g., *head* and *taxi* (towards, along, into).

6.4. Practice and revision — Verbs of movement and explaining how something works

1. Complete the text below by putting the verb in brackets in the most appropriate tense:

An escape slide ____ (SIT) inside a carbon fibre pressure cap covered by a casing of material similar to the aircraft interior walls — that big square box at the bottom of an airliner's interior door.

Pushing a lever on the interior door — a large silver bar on early airliner models, smaller handles on later ones— _____ (ARM) the slide mechanism by linking the slide to the door sill. When the lever is in the "armed" position, opening the door ____ (PULL) the slide out of its pack. The slide then ____ (DROP) to the correct orientation for inflation to begin (when flight attendants ____ (ISSUE) the call to "cross-check" after landing, that is a signal for one attendant to check another's action to disarm the doors to prevent slides from inadvertently deploying). Slides ____ (INFLATE) with an initial boost from a canister of compressed carbon dioxide and nitrogen. The canister provides only about one-third of the volume needed to inflate the slides. The remaining volume is supplied by ambient air, channelled into the slides through aspirators. When the inflation mechanism is triggered — by a lanyard pulled by the slide as it ____ (TUMBLE) from its storage case — gas from the canister ____ (ACCELERATE) through the aspirators at high speed, creating a vacuum that ____ (SUCK) ambient air into the aspirators through louvers. When the slide is fully inflated, the louvers ____ (CLOSE) (word count: 222).

2. Check the meaning of the following words in a dictionary:

visual approach	localiser
glide slope	holding pattern
belly landing	priority landing
emergency landing	landing gear
touchdown zone	displaced threshold
evacuation slides	laser attack

6.5. Translation

Translate the following excerpt into your L1:

Excerpt 7. *Flying taxi service*

Once exclusively the realm of science fiction, a variety of vertical take-off and landing (VTOL) aircraft transporting people and cargo may be plying urban skies in the relatively near future. Several companies are working to develop this new class of aircraft, which holds tremendous potential for numerous business aviation uses. Development of these VTOL urban mobility aircraft has been underway for several years, but recent industry initiatives have driven renewed interest in the concept. For example, one of those efforts that garnered widespread attention last year was the announcement of Uber AIR, a program to establish commercial "flying taxi" service in cities, including Dallas, TX; Los Angeles, CA; and Dubai, United Arab Emirates. The value proposition put forth by Uber AIR, as well as other urban mobility solutions providers, is that on-demand aviation using VTOL aircraft has the ability to provide greater productivity, fuel savings and time savings for companies, while also improving the speed and quality of daily commutes for passengers (NBAA, 2018) (word count: 160).

6.6. Vocabulary

1. Complete the table by providing a list of verbs of movement frequently used in the take-off and landing phase of the flight

Phase of flight	Take-off	Landing
Verbs describing movement		

2. Complete the table below:

	GEAR	EMERGENCY	
LANDING			***LANDING***

After having completed the table, activate the compounds in a sentence, e.g.

1.*The landing gear did not retract*.

2. *There was an emergency landing due to an early labour onboard*.

7 — ITEMS ONBOARD; EXPRESSING OBLIGATION AND PROHIBITION

7.1. Pre-reading

Skim the text below. What prior knowledge do you have about items prohibited and/or allowed onboard?

7.2. Reading and vocabulary: Plants and floral arrangements onboard

Read the text below before answering the questions:

With Valentine's Day approaching, U.S. Customs and Border Protection officers want to remind travellers of prohibited flowers from Mexico, so there are no surprises at the border.

Chrysanthemums, and orange jasmine from Mexico, are prohibited through the passenger ports of entry. Travelers cannot bring floral arrangements with these flowers into the country. Roses, carnations, and most other cut flowers are allowed into the U.S. after they pass inspection. However, plants potted in soil cannot be brought from Mexico. Travelers must declare all flowers and plants to CBP officers.

"We work to protect U.S. agricultural resources from harmful pests, so we thoroughly inspect agricultural products brought across the border," said Area Port Director David Salazar. "We want travellers to know ahead of time what they can and cannot bring into the country so there are no surprises at the port of entry."

Throughout the year, and especially around Valentine's Day, CBP agriculture specialists are busy making sure that flower imports are free from insects and diseases that could harm the agricultural and floral industries of the United States. They are specially trained to inspect plant and animal products for signs of insect infestation and disease. Their careful attention to detail ensures that even microscopic pests are detected and prevented from being introduced into the United States where they could cause

significant economic or environmental harm. With the current restrictions, CBP is trying to prevent the entry of plant fungal pathogens, such as "Chrysanthemum, and White Rust," from entering the U.S. Additionally, some cut greenery, which are the plants used to fill a bouquet, may have pests or diseases. For example, Murraya (common name "orange jasmine") is a host for Asian citrus psyllid, a dangerous pest of citrus. If any portion of a bouquet has pests, the entire bouquet will be confiscated (U.S. Customs and Border Protection, 2021, public domain) (word count: 300).

Discussion

1. Summarize the main idea of the text.
2. According to the text, are all floral arrangements prohibited onboard?
3. Which names of plants are you familiar with in both English and Latin?
4. How would you translate *plants potted in soil*?
5. What other prohibited items onboard are you familiar with (except food)?

Assignment

In 250-300 words, elaborate on one of the two topics:

1. Most people do not know what they cannot bring onboard.
2. Can you bring houseplants onboard? Provide at least three arguments against.

7.3. Grammar focus—Expressing obligation and prohibition

When expressing obligation and prohibition in general English for aviation, you can activate modal verbs, e.g., *must* and *have to*. According to most grammar definitions, *must* is used when we are giving our own opinion of what is necessary (e.g., *I must wash my hair*). However, *must* is also used in written rules, calls for applications and exam instructions, as in: *All applications must be handed in by June 2021.* or *Students must write in ink.* If we add a negation to *must* (*mustn't*), we are expressing the meaning that something is not to be done, e.g., *You mustn't ride a bicycle on the runway*.

As for *have to*, it used to say what someone is required or obliged to do, i.e., when we are not expressing our opinion about what must be done. The usual examples provided are: *I have to work from 9 to 5.* because someone requires these working hours (Murphy, 2004, p. 62).

When it comes to expressing prohibition *can* and *cannot* may also be activated in aviation English as in: *Passengers know what they can or cannot take on the plane*. Prohibition can also be expressed by means of the passive voice as in: *it is prohibited, it is not allowed, it is required (that), it is permitted, it is not permitted*. Other phrases found in the corpus related to flight regulations and restrictions are: *it shall be unlawful...*, *it is breaking the law...*, *....is punishable*, *shall be punishable...* (for more information about *legal shall*, see Okičić, 2020).

In each case, we need to make sure that we understand whether something is breaking the law and be familiar with the above listed expressions usually activated when expressing prohibition and obligation when it comes to both travelling as a passenger, working at the check-in counter, or working as a flight-attendant or pilot. The prohibitions in commercial aviation, at least when it comes to passengers, are usually related to which items can be brought onboard, how one should spend time while travelling on an aircraft and which documents are needed for travelling.

7.4. Practice and revision

1. Tick which items can be brought onboard:

wine	
beer	
jam	
vinegar	
cake	
honey	
cheese	
meat	
honey	
energy bars	
soup	
yogurt	
salad	
sandwiches	
razors	
matches	
deodorants	
perfume	
laptop	
mobile phone	

2. Mark these sentences as True or False:

1. Crampons are permitted in carry-on bags. _____
2. Aerosol insecticides are not allowed in carry-on. _____
3. Ammunition is allowed in checked bags. _____
4. Baby food is allowed in carry-on bags. _____
5. Even if an item is generally permitted, it may be subject to additional screening. _____

7.5. Translation

Translate the following excerpt into your L1:

Excerpt 8. *Phytosanitary statement*

This is to certify that the plants, plant products or other regulated articles described herein have been inspected and/or tested according to appropriate official procedures and are considered to be free from the quarantine pests specified by the importing contracting party and to conform with the current phytosanitary requirements of the importing contracting party, including those for regulated non-quarantine pests (IncoDocs, 2019) (word count: 60).

7.6. Vocabulary

List the words from the text above you were not familiar with and provide their translation equivalents:

8 — FLYING AND RESTRICTIONS; IF-SENTENCES

8.1. Pre-reading

Skim the text below. What prior knowledge do you have about dangerous health conditions and flying?

8.2. Reading and vocabulary: *COVID-19 vaccine and flying*

Read the text below before answering the questions:

If you are clinically extremely vulnerable, you could be at higher risk of severe illness from coronavirus. If you are clinically extremely vulnerable, you are no longer advised to shield. However, you should continue to follow the guidance for people who are clinically extremely vulnerable, hence you are advised to continue taking extra precautions to protect yourself. It is important that you continue to keep the number of social interactions that you have low and try to limit the amount of time you spend in settings where it is difficult to maintain social distancing.

To help protect yourself and your friends, family, and community you should continue to follow all of the guidance on this page even if you've been vaccinated against COVID-19. The vaccines have been shown to reduce the likelihood of severe illness in most people. Like all medicines, no vaccine is completely effective, so those who have received the vaccine should continue to take recommended precautions to avoid infection. We do not know by how much the vaccine stops COVID-19 from spreading. Even if you have been vaccinated, you could still spread COVID-19 to others (GOV.UK, 2020) (word count: 188).

Discussion

1. Where do you think this excerpt is taken from?
2. What should people who are clinically extremely vulnerable do if they want to travel?
3. Why should people continue taking recommended precautions even if they have been vaccinated against COVID-19?
4. How would you define *social interaction* in the given context?
5. What other coronavirus restrictions are you familiar with?

Assignment

In 250-300 words, elaborate on one of the two topics:

1. Travelling internationally during the COVID-19 pandemic.
2. Aviation-related jobs that qualify for exemptions when travelling during the COVID-19 pandemic.

8.3. Grammar focus: If-sentences

If-sentences (especially Type 0, which will be discussed in the lines that follow) are common in aviation English. The following table should help you revise how if-sentences are formed and for translation practice, examples are provided from *Dictionary of Aviation* (2007):

Type 1	**Type 2**	**Type 3**
If + present, followed by will Type 1 is used to imagine the consequences of events that are likely to happen: e.g., If our flight LANDS on time, we WILL ARRIVE in time for dinner.	If + past, followed by would Type 2 is used to imagine the consequences of events that are very unlikely to happen or events that cannot possibly happen: e.g., If I HAD enough money, I WOULD TRAVEL by Austrian.	If + past perfect, followed by would have + past participle Type 3 is used to imagine the consequences of events that happened or began to happen in the past: e.g., If you HAD ASKED me to confirm the booking, I WOULD HAVE SENT you the ticket.

Compare the table above to the examples provided below and discuss each example:

1. If in-flight conditions require the captain to activate the fasten seat belt sign, all cabin service ceases and cabin crew take up their assigned seats and strap in.
2. If you remove fuel, oxygen or heat from the fire triangle, combustion will cease.
3. There is a warning flag on the instrument if there is a problem.
4. If you need something, press the call button and a cabin attendant will respond within a few minutes.
5. If the Earth were/was a uniform globe, the average temperature would vary only with latitude.
6. If there is smoke in the cabin, clear commands from the crew will help to guide passengers to the emergency exits.

7. If the operating pressure falls or fails, a mechanical lock holds the reverser in the forward thrust position.
8. If the air over a large region were homogeneous, there would be no horizontal differences in surface temperature.

In some of the examples above (sentences 1, 3, and 7), both the if-sentence and the main clause are made with a verb in the *Present Simple Tense*. This type of a conditional is called *zero conditional* and is used to talk about situations and facts that are always true. For more practice on if-sentences, you may consult any grammar book but for technical English, it is recommended that you compare examples provided in English grammars and contrastive grammars (cf. Jones, 1990 & Šestić, 2002).

8.4. Practice and revision

1. Match the verbs (1-5) on the left to the nouns (a-e) and translate the verb phrases:

1. to quarantine	a. symptoms
2. to axe	b. arrivals
3. to flatten	c. in-flight magazines
4. to self-monitor	d. the curve
5. to take	e. all precautions

8.5. Translation

Translate the following excerpts into your L1:

Excerpt 9. *Keeping the blinds open*

While flying, you might have been asked by a flight attendant to open the window blinds. In fact, those blinds have to be open during a take-off and landing. But why does this need to be done? The first reason is safety. If anything happens during a take-off or landing, your eyes will already be used to the day or night light outside, thus you will be able to react more quickly. Another reason for keeping the blinds open is visibility of aircraft outside.

If any problems occur with the engine or wings, the crew can see it out of those tiny round windows in a cabin. If the aircraft needs to be evacuated, passengers and the whole crew is able to see which side of the aircraft is safer for evacuation. If the blinds are closed, emergency services couldn't see what might be happening inside the aircraft? Neither smoke, nor a fire inside the cabin would be visible to emergency services from the outside (BAA, 2019) (word count: 165).

Excerpt 10. *Self-quarantine*

If doctors find that someone has the disease, we say that they test positive for it. If there is an unusually high number, we say that there is a spike in cases, whereas if numbers seem to have reached their highest level and are now falling, with no expectation that they will rise again, we say that they have peaked. Governments have to decide how to contain the spread of the virus. Towns and cities may be put in lockdown so that nobody can enter or leave them, countries may close their borders and airlines sometimes suspend flights to certain places. People who may have the disease are often placed in quarantine. Passengers returning from an area with coronavirus may be asked to self-quarantine. Despite the fact that most experts don't think they are effective, some countries have seen huge queues for face masks. Meanwhile, scientists are racing to develop a vaccine. (Walter, 2020) (word count: 151).

8.6. Vocabulary

List the words from the text above you were not familiar with and provide their translation equivalents and transcription:

WORD	PRONUNCIATION	TRANSLATION

9 — ACCIDENTS AND INVESTIGATION; REPORTING VERBS

9.1. Pre-reading

Skim the text below. What prior knowledge do you have about investigation of accidents and legislation?

9.2. Reading and vocabulary: *Handling an emergency landing*

Read the text below before answering the questions:

On August 3, 1935 at about 12:55 a.m. approximately 30 miles east of Albuquerque, New Mexico, an airplane of United States registry, piloted by a licensed airman, while being operated in scheduled flight carrying passengers and United States mail, was forced to land with resultant destruction of the aircraft, but no serious injuries to the passengers or crew.

The plane, a Douglas, model DC-2, bore Department of Commerce license number NC-13722 and was being operated by Transcontinental and Western Air, Incorporated, between Los Angeles, California, and Newark, New Jersey, with scheduled stops at Albuquerque, Amarillo, Kansas City, Columbus and Pittsburgh. The pilot held a Department of Commerce transport pilot's license and a scheduled air transport rating. The co-pilot also held a Department of Commerce transport pilot's license and a scheduled air transport rating.

After refuelling, this trip, known as Flight 6, took off from Albuquerque at 12:31 a.m. The pilot climbed to an altitude of 9,300 feet where he changed the propeller settings from low to high pitch and switched from the emergency tank of 87 octane fuel used while taking off to the left main tank of 80 octane fuel used for cruising. Shortly after this, while at an altitude of 9,500 feet, the left engine stopped and immediately after, the right engine stopped. The pilot immediately changed back to the emergency tank and with the assistance of the co-pilot attempted to get the engines started

again by pumping the throttles and using the wibble pump. This was continued until the plane had lost so much altitude that an emergency landing could not be avoided. The pilot then dropped two flares, seeking a landing field, and by the aid of a third flare, dropped by a plane which had come to his assistance, succeeded in effecting emergency landing (Department of Commerce, 1935) (word count: 299).

Discussion

1. How would you define 'emergency landing'?
2. What happened to Flight 6? Explain briefly.
3. Do you think this event could be compared to a similar event in the 21st century?
4. What decisions did the pilots of Flight 6 have to make in order to successfully make an emergency landing?
5. Check the following website for cases of emergency landing: https://www.nationalgeographic.co.uk/video/tv/air-crash-investigation

Assignment

In 100-150 words, elaborate on the following two topics:

1. Crew fatigue and changing time zones are major problems when it comes to accidents.

2. Cognition in aviation: wrong judgements and possible visual illusions.

9.3. Grammar focus: past tenses and reporting verbs

When talking about past tenses in the English language, *Past Simple* is the tense most commonly used to refer to events that happened and were completed in the past. What is difficult to understand by some learners of English as a foreign language is the explanation that the *Past Perfect Tense* is used to emphasise that *one event happened before another event in the past* (Jones 1990, p. 34). If we observe the last two sentences in the text above, we can conclude that the plane first lost its altitude and that the emergency landing followed. That is why the *Past Perfect Tense* is used to emphasize that one event happened in the past before another event in the past, just like in the last sentence, from which it is clear that a plane (some plane) first came to assist Flight 6 and that Flight's 6 landing followed this event in the past. Other tenses commonly used to talk about events that happened in the past for a longer duration are *Past Continuous Tense (Past Progressive)* and *Past Perfect Continuous Tense (Past Perfect Progressive)*.

For instance, we may use *Past Continuous Tense* to talk about an event in the past that was interrupted by another event in the past that lasted for a shorter time, as in: *They were operating the flight when they received a call from Medlink*. However, it could be concluded that continuous tenses are less frequently used in general English for aviation than the *Past Simple* or the *Past Perfect Tense*, which may be also observed from various corpora. One possible explanation for this is that, at least when it comes to accident reports, the focus is on immediacy of action and reporting how events unfolded one after another.

As was mentioned earlier, the *Present Perfect Tense* is used to refer to the past as well but in a specific sense in the way that, unlike the *Past Simple* "the residence has continued up to the present time (and may even continue into the future)" (Quirk et al., 1985, p. 191). We are used to being given an explanation that this tense is used for an event that happened in the past but has a "consequence" now as in: *I have lost my keys*. The event did happen in the past and the "consequence" is found in the fact that now I cannot enter my house. However, a better term is the one used by Quirk (ibid.) and that is "relevance" or "current relevance" as in, for instance, emergency

situations when someone asks: *Has she eaten anything?* When reporting about events in the past, the passive voice is also frequently used, as are the reporting verbs. For that reason, the passive voice and reporting verbs will be discussed in the chapters that follow.

9.4. Practice and revision

1. Put the verbs in brackets in the most appropriate tense to complete the text below:

Over the years, several Boeing 747 aircraft that formerly _____ (FLY) passengers _____ (FIND) a second life at NASA. Two of those 747s _____ (FIND) themselves piggybacking NASA's space shuttles around North America. While it was not unknown for the space shuttles to be transported short distances by road, these two 747s _____ (DO) much of the long-distance heavy lifting.

Between 1981 and 2011, NASA _____ (FLY) 135 space shuttle missions. The final flight _____ (BE) in July 2011 when Atlantis successfully _____ (LAND) at Kennedy Space Centre in Florida. High ongoing maintenance costs and economic rationalization _____ (BE) behind the shuttle's demise. However, the space shuttle _____ (BECOME) dated, and the Columbia disaster in 2003 _____ (CAUSE) significant reputational damage. (word count: 110)

2. Consult the following website for more information about irregular verbs:

http://www.englishpage.com/irregularverbs/irregularverbs.html

According to this website, an extensive analysis of over 2,000 novels and resources was conducted and 680 irregular verbs found, including archaic forms and prefixed verbs. However, in general English for aviation, you would be working with a fewer number of verbs and their irregular forms. You may select the most frequent verbs and add them to your vocabulary or grammar log (for instance, in one of the previous exercises, *keep* is used four times).

9.5. Translation

Translate the following excerpt into your L1:

Excerpt 11. *Pet boarding procedures during the pandemic*

If you're staying in a managed quarantine hotel, your pet will not be able to stay with you at the hotel unless it's an assistance dog. You'll need to arrange for someone to collect your pet and look after it while you're in quarantine. For example, a friend or relative or a licensed pet boarding service. They could collect your pet from:

- an animal reception centre (if there is one)
- outside the managed quarantine hotel when you arrive

If your pet is a ferret and staying in England, you should tell anyone looking after it to keep it away from other ferrets and people from other households for 21 days (GOV.UK, 2021).

_____
_____
_____
_____
_____
_____
_____
_____
_____

9.6. Vocabulary

— Explore the internet and find out when/if the word "pet" was replaced by another word.

— How would you translate "assistance dog" into your L1?

— Explore the internet and find out which phrases in aviation English have been replaced in contemporary English by a less offensive or a more inclusive equivalent.

10 — REPORTING ABOUT EVENTS; THE PASSIVE VOICE

10.1. Pre-reading

Skim the text below. What prior knowledge do you have about "metal fatigue"?

10.2. Reading and vocabulary: *Damage of the aircraft*

Read the text below before answering the questions:

Reports were received of cracks in thirteen of the sixteen support angles in the lower jamb of the main deck cargo door due to fatigue. Cracks were also found in the lower frames and reinforcing angles of the main deck cargo door. Continued operation with such cracking could result in loss or opening of the cargo door, and loss of control of the aircraft.

Amendment 1 was issued in response to two new main deck cargo door FAA airworthiness directives; which were prompted by the development of a modification that will provide better protection against the effects of structural fatigue, and an inspection and replacement of any lower frame or reinforcing angle of the main deck cargo door when it has reached its maximum life limit.

Amendment 2 is issued in response to a new FAA AD which supersedes AD 2001-8- 07. The new AD continues to require the existing actions, but corrects reference to an incorrect fuselage station. The one-time modification requirement of AD 2001-09-15 remains unchanged (Airworthiness Directive, Commonwealth of Australia, 2004) (word count: 168).

Discussion

1. Who do you think wrote this text? What is the profile of the author in your opinion?
2. What is meant by "airworthiness"?
3. How would you define "structural fatigue"? Why does it occur?
4. Discuss which sentences were used in the passive voice and why.

5. Do you think the text would have the same effect on the reader if all the sentences in the passive voice were to be replaced by their equivalents in the active voice? If not, why not?

Assignment

Write about changes in logistics and the time needed for pick-up and delivery. Discuss the issue in terms of competition, visibility and e-business. Do not use more than 200 words.

10.3. Grammar focus: *reporting about events, the passive voice*

The passive voice is used to emphasize the object or to de-emphasize the subject/agent of the action. The passive voice is also used if you do not know who is responsible for an action or if you are trying to avoid mentioning who/what is responsible for an action, e.g., *Several windshields were damaged*. In other words, the active voice focuses on the subject of the verb (i.e., doer of the action) while in the passive voice, the focus is placed on what happened. A sentence in the passive voice may also be more polite than in the active voice for instance, if you say that "a mistake was made" (see Naumoska-Sarakinska & Naumoska, 2018). This claim, of course, depends on the context as when it comes to aviation English, for instance, such choices may also point to the author's choice of avoiding mention with regard to who is responsible for something or whether something was caused by the human factor or something else (e.g., birds in the case of the

windshields being damaged). For that reason, in general, active sentences should be preferred. However, in formal writing, reports and e-mails, it is difficult to avoid the passive voice as it is more appropriate for the genre.

As for the formation of the passive voice, the object of the active sentence becomes the subject of the passive sentence, and the subject of the active sentence becomes the object of the passive sentence (or it is omitted). What is also important to review when it comes to the passive voice is that: 1. the passive voice includes a form of the verb *to be* + *past participle*; 2. only transitive verbs can be made passive; 3. intransitive verbs cannot be made passive; 4. the tense of the active verb is used the corresponding passive verb; 5. the *by (prepositional)-phrase* is usually omitted (Smalley et al., 2001, p. 274).

With regard to the tense of the active sentence used in the corresponding passive sentence, consult grammar sections of online dictionaries or BBC Learning English (e.g., 6-Minute Grammar).

10.4. Practice and revision

1. Read the sentences below and rewrite them using the passive voice:

1. Lion Air considers N219.

_____

2. Aviation regulators are investigating the incident.

_____

3. Cabin crew forced passengers to sit in the aisle.

_____

4. Cabin crew forced the passenger to sit in the aisle.

_____

5. Another aircraft has replaced the Wizz Air flight from Sarajevo to Skopje.

_____

6. The airline had not denied the incident.

_____

7. They will sell the used tires to local and foreign companies.

_____

8. We will be inviting the bidders to the used spare parts auction process.

_____

9. The company shall provide the Deputy Director (Engineering) with accommodation.

_____

10. The remuneration package will reflect the expertise required.

_____

Note that in Example (1), the main verb is in the Present Simple Tense. However, the main verb could also have been put in the Present Continuous Tense (e.g., *Lion Air is considering N219*.) to talk about current events/trends going on as the company is considering the purchase for a certain period of time.

10.5. Translation

Translate the following excerpt into your L1:

Excerpt 12. *The Bermuda Triangle*

Bermuda Triangle: a section of the North Atlantic Ocean off North America in which more than 50 ships and 20 airplanes are said to have mysteriously disappeared. Reports of unexplained occurrences in the region of the Bermuda Triangle date to the mid-19th century. Some ships were discovered completely abandoned for no apparent reason; others transmitted no distress signals and were never seen or heard from again.

Aircraft have been reported and then vanished, and rescue missions are said to have vanished when flying in the area. However, wreckage has not been found, and some of the theories advanced to explain the repeated mysteries have been fanciful. Although theories of supernatural causes for

these disappearances abound, geophysical and environmental factors are most likely responsible (Encyclopædia Britannica, 2021, public domain) (word count: 123).

10.6. Vocabulary

Events from the past are sometimes related to superstitions common in stories about sailors and aviators. This is one of the reasons the English language has numerous proverbs and expressions related to weather conditions and sailors, mythical creatures, mysterious events, items that cannot be brought onboard, items or actions thought to bring bad luck, etc.

Find some of the proverbs and use a good dictionary to help you with the origin of phrases or proverbs (e.g., *Clear moon, frost soon*). Pay attention to both the active and the passive voice.

11 — PROBLEM-SOLVING IN AVIATION; EXPLAINING A PROCESS

11.1. Pre-reading

Skim the text below. What prior knowledge do you have about de-icing?

11.2. Reading and vocabulary: *Solving the problem in de-icing conditions*

Read the text below before answering the questions:

Engines cannot be de-iced with glycol-based fluids, as is the norm for airframe de-icing, primarily due to the damage that the fluid could cause to the engine and to the potential contamination of the bleed air system. The normal method of de-icing an engine is by using a brush or broom to remove any loose contamination and then warming the affected areas of the engine to melt any ice. This warming may be accomplished by putting the aircraft inside a hanger for a period of time, but more commonly, a directed flow of hot air from an external heat source such as a Herman Nelson unit is used. Applied heat from an external source is much more efficient if purpose-made engine inlet and exhaust covers are put in place to retain the warm air within the engine and to keep cold ambient air out.

One of the main problems when using external heat sources is the difficulty of controlling the temperature of the airstream and the potential for damaging some engine components. Emerging technologies, such as tempered steam, are being developed for engine core and fan de-icing applications to address this issue. Most engine manufacturers also have a recommended "ice shedding" procedure to be carried out if ice build-up on the fan is suspected during ground operations.

This procedure will be undertaken with the aircraft stopped with brakes applied and is accomplished by accelerating the engine to a specified N_1 (fan rotation speed) for a specified period of time. The procedure is repeated based on a specified time interval until the aircraft is airborne or the

icing conditions no longer exist. Some engine manufacturers also specify a similar procedure in the case of abnormal in-flight vibration after periods in descent in icing conditions at low thrust (SKYbrary, 2021) (word count: 296).

Discussion

1. What are the most common methods of de-icing mentioned in this excerpt?

2. Explain at least one de-icing procedure.

3. Are there any new emerging de-icing technologies? How do they work?

4. What does "Herman Nelson unit" refer to? Explain briefly.

5. Have you heard about any incidents related to de-icing or similar problems? How were they solved?

Assignment

In 250-300 words, elaborate on one of the two topics:

1. Types of de-icing equipment.

2. The differences between de-icing and anti-icing equipment.

11.3. Grammar focus: explaining a procedure or a problem

The excerpt given above may be used as an illustration of a well-known procedure in the aviation industry. In your career, you will often need to explain a procedure or a process in both oral and written forms, e-mail and text messages included. When it comes to explaining a procedure, you may look up the vocabulary used in the so-called "process essays" in which direct guidance in a step-by-step fashion is provided. In describing a process, the style used may be instructional, i.e., containing imperatives as you are giving instructions to somebody how to do something and how to complete the process without failure. The style may also be descriptive, as the one provided above, in which the focus is on describing a procedure or a problem and also providing solutions for it. In the texts and messages (text messages and e-mail), transition words will feature very frequently as they are used to improve coherence and cohesion.

If you use transition words, such as *first/firstly*, *second/secondly*, *initially*, *later*, *next*, *soon*, *eventually*, *in the end*, *in the future,* it will be easier for the reader or listener to understand the problem, the solution(s) or the procedure.

The purpose of process or problem-solution texts and messages delivered in real time or asynchronously is to inform and explain, but also, by making the reader or listener understand the process, to allow them to recreate the process, if necessary, especially when it comes to technical English or aviation English in this case.

11.4. Practice and revision

1. The excerpt below provides several *solutions* to a problem. Which problem do you think is explained in this excerpt? Which word could fill in the gaps in the excerpt below?

A solution to this problem has been to show on the scope the actual weather in the area. This clutter can be switched on and off. Another solution is to feed the weather information into the automatic data processing equipment for incorporation into the controller's computer processed ____

scope. This information appears in digital form on the _____ scope. In most _____ equipment, the controller is provided with the capability of using MTI alone, MTI plus Circular Polarization, or Circular Polarization alone, thus allowing him a considerable amount of flexibility. Besides the problems caused by clutter, the slashes on the SSR scope, if too large, could overlap with other slashes making it difficult to distinguish individual aircraft. To keep large slashes apart would require the controller to provide extensive separation between aircraft with resulting delays. This too is improved somewhat with the help of _____ automation. Although most of the deficiencies in _____ are characteristic of _____ technology, improvements are constantly being made which will assist the air traffic controllers in the future (word count: 167).

Pay attention to the first two sentences. Which word can be used to replace 'a' in 'a solution...'? Which word can be used instead of 'another' in 'another solution...'?

2. Check the meaning of the following words or phrases in a dictionary:

a long-term solution

to unveil a plan

to make a tentative suggestion

to reach a decision

the deciding factor

to put ideas into practice

to reject out of hand

11.5. Translation

Translate the following names of the procedures in your L1:

Fuel requirements: _____

IFR Flight Plan and Pre-flight preparation: _____

VOR Equipment Check: _____

IFR Flight Plan Filed with ATC: _____

IFR Take-off and landing (Visibility Limitations): _____

Minimum Altitudes and Distances for IFR operations: _____

IFR Flight Levels, Altitudes, and Cruising Speeds: _____

Flight Path Clearances: _____

IFR Communications and Communication Failures: _____

IFR Malfunction Reporting in Controlled Airspace: _____

Special Air Space General Operating Procedures: _____

Closing Flight Plan after completed flight: _____

(Epic Flight Academy, 2020).

11.6. Vocabulary

When you are informing your listener or reader about a particular problem or a process, it is important that you organize information in a structured pattern. Additional useful words, phrases and sentence patterns that can be activated in describing a process are as follows: *the first step, the next step, the third step, as, while, when, soon afterward, from then on, the last step, before, after*.

Try and paraphrase the first excerpt and explain de-icing by using one of the words and phrases provided:

You can also use *there is* and *there are*—sentence patterns when referring to processes and solutions to problems, as in: *There are several major steps involved in performing a de-icing procedure*.

As an additional activity, search for examples of emails or text messages in English exchanged among co-workers in the aviation industry in which they explain:

a) a procedure *or*

b) a problem (and how it has been solved) *or*

c) a problem and how it cannot be solved *or*

d) a problem and potential solutions *or*

e) a problem and solutions and procedures applied in the past that cannot be applied in the present due to several factors.

12 — THE FUTURE OF AVIATION; EXPRESSING THE FUTURE

12.1. Pre-reading

Skim the text below. What prior knowledge do you have about the level of office work cooperation necessary in the aviation industry?

12.2. Reading and vocabulary: *Safety culture*

Read the text before answering the questions:

Trust can be defined as a belief or expectation that someone will do what they say they will. Because safety is dependent on cooperation between people and the open sharing of sensitive information, a positive Safety Culture cannot survive without trust.

Trust is necessary in each of the following relationships:

- Employees' trust of their managers, created for example by managers encouraging people to speak up and report safety problems without fear of being blamed.
- Employees' trust of their colleagues. This will be evident from a work environment that allows everyone to do their job with a reasonable level of confidence that things will go well (that not everything needs to be double checked); where stress levels are manageable; and where people display appropriate wariness about threats or hazards.
- Managers' trust of employees. This is evident, for example, when they empower employees to make or inform local safety decisions. (SKYbrary, 2021) (word count: 148).

Discussion

1. What do you think the future will bring in terms of not only "seamless travel" but also building trust and safety culture?
2. What do you expect in the future when it comes to unmanned aerial vehicles (UAVs)?

3. What do you expect in the future when it comes to robotics?

4. What do you expect in the future when it comes to big data?

5. How important in your opinion is innovating for future travel?

Assignment

In 100-150 words, elaborate on the following two topics:

1. Evolution and the future of GPS (Global Positioning Satellite)

2. Improved efficiencies of the ATC system in the future

3. Improved levels of safety in the future

12.3. Grammar focus: expressing the future

It would not be a mistake to say that a great number of texts available online from the aviation industry and a great number of texts published on a regular basis on different aviation portals and forums are about the future, the future of aviation and new inventions. If texts are about the past, they mostly revolve around statistics (i.e., the number of passengers boarding flights in a certain period, the world's busiest airports, the number of airport incursions, accidents, etc.). The future is always looked upon by the authors as something bright in terms of new inventions and new IT solutions but also with a degree of caution or worry when it comes to security, cyber-attacks and similar issues. As for grammars, we know that the future can be expressed by means of *Present Simple Tense*, *modal verbs* (will/shall), *going to* and *Present Continuous Tense*, *Future Perfect Tense*, as well as *Future Perfect Continuous Tense*.

In the lines that follow, it will be briefly explained how the usage of these tenses works in real-life situations:

- *Present Simple Tense* — is used in timetables and schedules (e.g., *The flight to Skopje leaves at 7.30 a.m.*).
- WILL future (WILL + main verb) — is used to indicate an action or circumstance which has not happened yet. The speaker can use *will + main verb* to express instant decisions (e.g., *I will send the report*.) and promises for the future (e.g., *I will tell her not to worry*.).
- *Present Continuous Tense* — is used to indicate what will be going on/happening for a longer period of time in the future and to talk about planned events (e.g., *I will be flying to Sarajevo when you wake up*.). As for planned events, we can also use *going to*, e.g., *She is going to leave her baggage at the airport and visit a few museums before her next flight*.
- *Future Perfect Tense* — is used to talk about an action that will be complete in the future before another action or event takes place (e.g., *I will have landed by the time you arrive.*).
- *Future Perfect Continuous Tense* — is used to indicate an action that will have happened for some time and will not be complete yet at a certain time in the future; it also shows a higher degree of certainty (see Naumoska-Sarakinska & Naumoska, 2018, p. 17).

12.4. Practice and revision

Write 5 career goals that you expect to achieve in the near future. Use the tenses given above.

12.5. Translation

Translate the sentences below into your L1:

1. We are analysing the results of the survey to understand what kind of travel experience our customers will want in the future.

_____

_____

_____

_____

2. The company will be replacing the filters twice as frequently as recommended.

_____

_____

_____

_____

3. Air travel is no longer going to be full of opportunities for coronavirus transmission because various inventions are going to be introduced as part of the flying experience, such as planes with empty middle seats.

_____

_____

_____

_____

12.6. Vocabulary

Underline the head word in each of the phrases below. Indicate which part of speech the head word belongs to:

1. deployment of rapid, accurate, affordable, easy-to-operate, scalable and systematic COVID-19 testing
2. global air connectivity
3. freedom of mobility
4. gargle test for coronavirus
5. a freshly inked agreement
6. lab processing
7. testing centres
8. complicated risk models
9. quarantine measures
10. constant changes in the rules imposed on travel

13 — AVIATION MAGAZINES; COLLOCATIONS IN ENGLISH FOR AVIATION

13.1. Pre-reading

Skim the text below. What prior knowledge do you have about *collocations* in English for aviation?

13.2. Reading and vocabulary: *On collocations*

A collocation is a combination of two or more words which frequently occur together (…). It can be difficult for learners of English to know which words collocate, as natural collocations are not always logical or guessable. There is, for example, no obvious reason why we say *making friends* rather than ~~*getting*~~ *friends* or *heavy rain*, not ~~*strong*~~ *rain* (O'Dell & McCarthy, 2008, p. 6).

As can be concluded from the paragraph above and the excerpts so far presented to the reader in this textbook, learners of English and professionals who use English in their everyday communication need to know that bilingual dictionaries are not always sufficient for finding certain domain-specific collocations (e.g., *climb rate*, *descend rate*). Learning why collocations matter helps one in knowing how to use the words one already knows accurately.

In addition, by learning collocations, we can also be better writers and speakers, and more interestingly for aviation English, we can, as O'Dell & McCarthy (2008) explain, "better understand when a skilful writer departs from normal patterns of collocation" (p. 6). This is especially applicable when it comes to understanding word play and humour in aviation magazines and blogs, for instance.

For that reason, it is important to use: bilingual dictionaries, monolingual dictionaries, as well as dictionaries of collocations to become a more proficient user of English.

Discussion

1. How often do you use monolingual or bilingual dictionaries to find certain phrases from your specific field?
2. Are there some phrases/expressions which are fixed and never change in English for aviation? Could you provide some examples?
3. How often do you communicate with speakers whose L1 is English?
4. Do you keep a log of phrases/expressions you learn in the process?
5. What is, in your opinion, the best way to learn new vocabulary when it comes to English for aviation?

Assignment

Write one paragraph about:

1. How you acquire new words and memorize expressions/phrases in aviation English.
2. How you learned new vocabulary from a mistake in communication/or from miscommunication.

13.3. Grammar focus: collocations and syntactic patterns in use

In order to understand why it is important to read carefully when it comes to phrases and collocations in use, a corpus-based study conducted for the purposes of this book, on the examples found in *Pilot* (2009), is presented to illustrate creative lexical and syntactic patterns noted in aviation English as follows:

- adjective (-less) + NOUN/NP (paperless cockpit$_{N}^{0}$, seamless transition$_{N}^{0}$),
- adjective (-er) + NOUN/NP (shallower menu $_{N}^{0}$),
- adjective (-ed) + NOUN/NP (streamlined integration$_{N}^{0}$),
- adjective + verb(-ing) + adjective + noun + NOUN/NP (slow-turning low-pressure turbine$_{N}^{0}$),
- noun$_{x}$ + preposition "to" + noun$_{x/Y}$ + NOUN/NP (air-to-air combat$_{N}^{0}$, air-to-ground mission$_{N}^{0}$, air-to-air missile$_{N}^{0}$, zero-to-hero programme$_{N}^{0}$),
- verb + conjunction + verb + adjective + NOUN/NP (tap-and-go flight touchscreen interface$_{N}^{0}$),
- noun + noun + noun + NOUN/NP (icon-style mode controls$_{N}^{0}$, comfort gel ear seals),
- adjective + noun + noun + NOUN/NP (dual-spool turbofan engine $_{N}^{0}$),
- verb + preposition "by" + noun + noun + NOUN/NP (fly-by-wire flight controls$_{N}^{0}$),
- adjective + adjective + adjective + noun + noun + NOUN/NP (super-soft double-foam head pad$_{N}^{0}$),
- adjective + noun + verb (past participle) + preposition + definite article + noun + adjective + noun/NP (low-cost paid-by-the-hour *aerial* surveillance$_{N}^{0}$: Aerial surveillance which is low-cost and which is paid by the hour.; single pilot instrument *flight* rules$_{N}^{0}$: The instrument flight rules which are intended for solo flying.),
- definite article + possessive noun + noun/NP (the aircraft's flight$_{N}^{0}$),
- definite article + possessive noun +noun + noun/NP (the 787's certification programme$_{N}^{0}$),

- (-ed) + adjective + noun + NOUN/NP (the type's first extended twin engines operation$_{N}^{0}$),
- adapted expressions from proverbs and literary works (Love at first sight and first flight. —*Love at first sight*. (addition); It takes a village to raise a pilot. —*It takes a village to raise a child*. (substitution); He loved his airplane not wisely but too well. —*He loved not wisely but too well*. (insertion)).

By noticing examples and paying attention to their structure, it is easier to learn new vocabulary and practice writing rather than using dictionaries only or learning collocations and syntactic patterns by heart, which is why reading domain-specific magazines and journals is of crucial importance for achieving the necessary proficiency levels. Furthermore, it is important to pay attention to specific priority lexical items in contemporary English for aviation and specific difficulties when it comes to speakers of different languages (see Kalajdžisalihović, 2017).

13.4. Practice and revision

Use the dictionaries available to complete the phrases below by providing a head noun in singular or plural:

Example:

air-to-air ___*combat*___, air-to-surface _____, fly-by-wire _____, tap-and-go _____, low-pressure _____, under-wing_____, low-pump _____, twin-engine _____, solar-powered_____.

13.5. Translation

Translate the excerpt below into your L1: Excerpt 13. "We're flying through an air pocket"

Turbulence-averse flyers, beware: "air pocket" is just another word for the winds that jostle a plane from different directions. Aimer says the term "air pocket" causes less panic than "turbulence" among passengers.

"As soon as we say 'turbulence,' people get scared," he says. "We use 'air pockets' to calm [passengers] down" (*Time*, 2019).

13.6. Vocabulary

Look at *13.2 Grammar focus: collocations and syntactic patterns in use*. Find translation equivalents in your L1 or consult online sources to understand the meaning of each noun phrase. For instance, "shallower menu" refers to the kind of touchscreen setting that does not allow the user to browse endlessly or for a long time before finding the necessary link or content.

14 — MULTILINGUALISM IN ENGLISH FOR AVIATION; AVOIDING MISCOMMUNICATION

14.1. Pre-reading

Skim the text below. What prior knowledge do you have about what is meant by "situational awareness" in aviation?

14.2. Reading and vocabulary: *Miscommunication and situational awareness*

Read the text below and answer the questions:

The default language of international aviation worldwide is English, although local languages are used concurrently for RTF communications, even in busy and complex operational environments. Sometimes this practice is justified on a local level by the reasoning that it avoids possible misunderstandings when addressing local specifics and facilitates the speed of the communication process with the native flight crews. However, controllers using both English for communication with international flights and the country's native language for communication with the local crews potentially prevent both crews from achieving the desired level of situational awareness with respect of the other traffic.

In the context of the operational environment, the use of the English standard phraseology reduces the risk that a message will be misunderstood. Use of Standard Aviation English phraseology is a major contribution to the reduction of ambiguity in aircraft/ATC communications and supports a common understanding among speakers of both:

- Different native languages and
- The same native language, but who use, pronounce or understand words differently.

English standard phraseology should be used in all communications (transmissions and receptions). When used properly, the information and instructions transmitted are of vital importance in assisting in the safe and expeditious operation of aircraft. However native language is still used locally, exceptionally for particular information or to describe unusual situations, or in case of an emergency. Incidents and accidents have occurred in which a contributing factor has been the poor situational awareness caused by the use of different languages on a single ATC frequency (SKYbrary, 2021) (word count: 248).

Discussion

1. According to the text, what is the relationship between situational awareness and language usage?
2. Could you provide some examples of situations when pilots usually switch to their L1?
3. What factors could contribute to poor situational awareness?
4. Would you say that bilingualism is an advantage or a disadvantage in a working environment where the 'default language' is English?
5. According to Grosjean (1985), bilinguals are fully competent speakers-hearers who have a unique linguistic profile. Do you agree?

Assignment

Conduct a thorough research and elaborate on one of the two topics in 350-500 words:

1. Benefits of multilingualism and bilingualism in aviation.
2. Incidents involving usage of different languages on frequency.

14.3. Grammar focus: language mixing and language borrowing

Acquiring a foreign language vocabulary is a life-long process. At the same time, in English for aviation, the frequency of usage of the already acquired phraseology is high, which reduces the risks of vocabulary attrition. In the life-long vocabulary learning process and life-long learning in general and in relation to multilingualism, there are instances of intentional and incidental learning (Hatch & Brown, 2000).

Another term that needs to be mentioned in this context is code-switching or "shifting between two languages in conversation with other bilinguals" (Barry, 2008, p. 150). Aviation English has gone through different phases in its long history when it comes to not only borrowing from other languages especially during WWI and WWII and when it comes to slang but also when it comes to language change or references that would be difficult to understand by the contemporary reader without research. At a 21st-century global check-in desk or cabin, *code-switching* is a broader term that needs more attention as instances of code-switching may also be manifested by means of language mixing, borrowing, blending, and digital semiotics as well.

14.4. Revision and research

Finally, in order to observe English in aviation as a global event, it is necessary to mention lexical items in use at a certain period of history in aviation English or as a part of army slang, such as: *arsey-tarsy, circus, comic business, baby elephant, blimp, blind spot, flaming onions, hun, hun-hunting, hunland, joy-wagon, office, quirk, scout, tripe*, etc. (Doyle & Walker, 2012, p. 176). For the meaning, users of English in aviation need to do a thorough research in etymology and usage of these and other lexical items used in aviation English when it comes to casual conversation among colleagues.

14.5. Translation

Translate the following excerpt into your L1:

Excerpt 14. *Different linguistic backgrounds and English for aviation*

According to the International Air Transport Association's (IATA) Airline Industry Forecast 2013-2017, airlines are expecting to see a 31% increase in passenger numbers, rising to 3.91 billion by 2017. With escalating growth in international air travel and passengers from different linguistic backgrounds, fluent English and proficiency in at least one other language is often required to reach even the interview stage of the recruitment process for ground crew and aviation staff. Furthermore, global connectivity and mobility have created a multicultural business environment, making managing workplace diversity a top priority at every level of an organization. In the aviation industry, multilingualism and multi-culturalism means business. Being able to converse in a passenger's or customer's native language connects them on a deeply psychological level with higher reassurance that their problems will be solved and their needs will be met (SKYbrary, 2021) (word count: 137).

_____

_____

_____

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14.6. Vocabulary

Think of *false friends* or words that are often confused with a word in another language but with a different meaning for the reason that the two words sound or look similar. Are there any such words in your L1 that may create miscommunication in an English-for-aviation environment?

CONCLUDING REMARKS

LIFE-LONG LEARNING: SOFT SKILLS AND LINGUISTIC COMPETENCES

Other areas of linguistic performance that also need to be mentioned at the end of this textbook and in the context of life-long learning are: listening skills, pronunciation, structure, fluency, and interactions. In English for aviation, the language proficiency requirements apply mostly to speaking and listening proficiency (see Manual on the Implementation of ICAO Language Proficiency Requirements, 2004). In this textbook, focus has been given to reading and guided writing.

In the future, we also need to re-examine to what degree is the content we teach by means of a foreign language, i.e., the English language, comprehensible to students when delivered within the established explanatory frameworks and syntactic structures. We also truly hope that our individual contexts will contribute to this topic and help linguists and language instructors better integrate content and language into the distinctive type of knowledge and cognitive processes frameworks that include not only subject matter knowledge but numerous linguistic competences as well. With that in mind, the aim of this textbook has been to present to the student and the reader a web of different topics branching under the umbrella of English for and in aviation to allow one to scoop up knowledges and critical issues relevant for the moment we are living in and to allow both students and readers to select from the materials presented either content, grammar points, critical thinking-based tasks or writing tasks that would best suit their needs or that can further be tailored for their needs.

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APPENDIX

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APPENDIX

Acronyms and abbreviations (sample)

A

AAM — Advanced Air Mobility
A/C — Aircraft
A/G — Air to Ground
A/H — Altitude/Height
AAF — Army Air Field
AAI — Arrival Aircraft Interval
AAP — Advanced Automation Program
AAR — Airport Acceptance Rate
AC — Advisory Circular
ACAIS — Air Carrier Activity Information System
ACAS — Aircraft Collision Avoidance System
ACC — Airports Consultants Council
ACC — Area Control Center
ACCT — Accounting Records
ACD — Automatic Call Distributor
ACDO — Air Carrier District Office
ACF — Area Control Facility
ACFO — Aircraft Certification Field Office
ACFT — Aircraft
ACI-NA — Airports Council International - North America
ACID — Aircraft Identification
ACIP — Airport Capital Improvement Plan
ACLS — Automatic Carrier Landing System
ACLT — Actual Landing Time Calculated
ACO — Office of Airports Compliance and Field Operations
ACO — Aircraft Certification Office
ACRP — Airport Cooperative Research Program
ADA — Air Defense Area
ADAP — Airport Development Aid Program

ADAS — AWOS Data Acquisition System
ADCCP — Advanced Data Communications Control Procedure
ADDA — Administrative Data
ADF — Automatic Direction Finding
ADG — Airplane Design Group
ADI — Automatic De-Ice and Inhibitor
ADIN — AUTODIN Service
ADIP — Airport Data and Information Portal
ADIZ — Air Defense Identification Zone
ADL — Aeronautical Data-Link
ADLY — Arrival Delay
ADO — Airline Dispatch Office
ADP — Automated Data Processing
ADS — Automatic Dependent Surveillance
ADS-B — Automatic Dependent Surveillance-Broadcast
ADSIM — Airfield Delay Simulation Model
ADSY — Administrative Equipment Systems
ADTN — Administrative Data Transmission Network
ADTN2000 — Administrative Data Transmission Network 2000
ADVO — Administrative Voice
AED — Aircraft Evaluation Division
AERA — Automated En-Route Air Traffic Control
AEX — Automated Execution
AF — Airway Facilities
AFB — Air Force Base
AFIS — Automated Flight Inspection System
AFP — Area Flight Plan
AFRES — Air Force Reserve Station
AFS — Airways Facilities Sector
AFSFO — AFS Field Office
AFSFU — AFS Field Unit
AFSOU — AFS Field Office Unit (Standard is AFSFOU)
AFSS — Automated Flight Service Station
AFTN — Automated Fixed Telecommunications Network

AGIS — Airports Geographic Information System (Replaced by ADIP)
AGL — Above Ground Level
AID — Airport Information Desk
AIG — Airbus Industries Group
AIM — Airman's Information Manual
AIP — Airport Improvement Plan
AIRMET — Airmen's Meteorological Information
AIRNET — Airport Network Simulation Model
AIS — Aeronautical Information Service
AIT — Automated Information Transfer
ALP — Airport Layout Plan
ALS — Approach Lighting System
ALSF1 — ALS with Sequenced Flashers I
ALSF2 — ALS with Sequenced Flashers II
ALSIP — Approach Lighting System Improvement Plan
ALTRV — Altitude Reservation
AMASS — Airport Movement Area Safety System
AMCC — ACF/ARTCC Maintenance Control Center
AMOS — Automated Meteorological Observation Station
AMP — ARINC Message Processor (OR) Airport Master Plan
AMVER — Automated Mutual Assistance Vessel Rescue System
ANC — Alternate Network Connectivity
ANCA — Airport Noise and Capacity Act
ANG — Air National Guard
ANGB — Air National Guard Base
ANMS — Automated Network Monitoring System
ANSI — American National Standards Group
AOA — Air Operations Area
AP — Acquisition Plan
APP — Approach
APS — Airport Planning Standard
AQAFO — Aeronautical Quality Assurance Field Office
ARAC — Army Radar Approach Control (AAF)
ARAC — Aviation Rulemaking Advisory Committee

ARC — Airport Reference Code
ARCTR — FAA Aeronautical Center or Academy
ARF — Airport Reservation Function
ARFF — Aircraft Rescue and Fire Fighting
ARINC — Aeronautical Radio, Inc.
ARLNO — Airline Office
ARO — Airport Reservation Office
ARP — Airport Reference Point
ARP — Aerospace Recommended Practice
ARRA — American Recovery and Reinvestment Act of 2009
ARSA — Airport Service Radar Area
ARSR — Air Route Surveillance Radar
ARTCC — Air Route Traffic Control Center
ARTS — Automated Radar Terminal System
ASAS — Aviation Safety Analysis System
ASC — AUTODIN Switching Center
ASCP — Aviation System Capacity Plan
ASD — Aircraft Situation Display
ASDA — Accelerate — Stop Distance Available
ASLAR — Aircraft Surge Launch and Recovery
ASM — Available Seat Mile
ASP — Arrival Sequencing Program
ASOS — Automatic Surface Observation System
ASQP — Airline Service Quality Performance
ASR — Airport Surveillance Radar
ASTA — Airport Surface Traffic Automation
ASV — Annual Service Volume
ASV — Airline Schedule Vendor
AT — Air Traffic
ATA — Air Transport Association of America
ATAS — Airspace and Traffic Advisory Service
ATCAA — Air Traffic Control Assigned Airspace
ATC — Air Traffic Control
ATCBI — Air Traffic Control Beacon Indicator

ATCCC — Air Traffic Control Command Center
ATCO — Air Taxi Commercial Operator
ATCRB — Air Traffic Control Radar Beacon
ATCRBS — Air Traffic Control Radar Beacon System
ATCSCC — Air Traffic Control Systems Command Center
ATCT — Airport Traffic Control Tower
ATIS — Automated Terminal Information Service
ATISR — ATIS Recorder
ATM — Air Traffic Management
ATM — Asynchronous Transfer Mode
ATMS — Advanced Traffic Management System
ATN — Aeronautical Telecommunications Network
ATODN — AUTODIN Terminal (FUS)
ATOVN — AUOTVON (Facility)
ATOMS — Air Traffic Operations Management System
ATS — Air Traffic Service
ATSCCP — ATS Contingency Command Post
AUTODIN — DoD Automatic Digital Network
AUTOVON — DoD Automatic Voice Network
AVON — AUTOVON Service
AVN — Aviation Standards National Field Office, Oklahoma City
AWIS — Airport Weather Information
AWOS — Automated Weather Observation System
AWP — Aviation Weather Processor
AWPG — Aviation Weather Products Generator
AWS — Air Weather Station

B

BANS — BRITE Alphanumeric System
BART — Billing Analysis Reporting Tool (GSA software tool)
BASIC — Basic Contract Observing Station
BASOP — Military Base Operations
BCA — Benefit/Cost Analysis
BCR — Benefit/Cost Ratio

BDAT — Digitized Beacon Data
BMP — Best Management Practices
BOC — Bell Operating Company
bps — bits per second
BRI — Basic Rate Interface
BRITE — Bright Radar Indicator Terminal Equipment
BRL — Building Restriction Line
BUEC — Back-- up Emergency Communications
BUECE — Back-- up Emergency Communications Equipment

C

CAA — Civil Aviation Authority
CAA — Clean Air Act
CAB — Civil Aeronautics Board
CAC — Citizen's Advisory Committee
CAD — Computer Aided Design
CARES — Coronavirus Aid, Relief, and Economic Security (CARES) Act
CARF — Central Altitude Reservation Facility
CASFO — Civil Aviation Security Office
CAT — Category
CAT — Clear — Air Turbulence
CATS — Certification Activity Tracking System
CAU — Crypto Ancillary Unit
CBI — Computer Based Instruction
CCC — Communications Command Center
CCCC — Staff Communications
CCCH — Central Computer Complex Host
CC&O — Customer Cost and Obligation
CCSD — Command Communications Service Designator
CCS7 -- NI — Communication Channel Signal-7 — Network Interconnect
CCU — Central Control Unit
CD — Common Digitizer
CDR — Cost Detail Report
CDT — Controlled Departure Time

CDTI — Cockpit Display of Traffic Information
CENTX — Central Telephone Exchange
CEP — Capacity Enhancement Program
CEQ — Council on Environmental Quality
CERAP — Center Radar Approach Control
CERAP — Central Radar Approach
CERAP — Combined Center/Radar Approach Control
CFC — Central Flow Control
CFCF — Central Flow Control Facility
CFCS — Central Flow Control Service
CFR — Code of Federal Regulations
CFWP — Central Flow Weather Processor
CFWU — Central Flow Weather Unit
CGAS — Coast Guard Air Station
CIP — Capital Improvement Plan
CLC — Course Line Computer
CLIN — Contract Line Item
CLT — Calculated Landing Time
CM — Commercial Service Airport
CNMPS — Canadian Minimum Navigation Performance Specification Airspace
CNS — Consolidated NOTAM System
CNSP — Consolidated NOTAM System Processor
CO — Central Office
COE — U.S. Army Corps of Engineers
COMCO — Command Communications Outlet
CONUS — Continental United States
CORP — Private Corporation other than ARINC or MITRE
CPE — Customer Premise Equipment
CPMIS — Consolidated Personnel Management Information System
CRA — Conflict Resolution Advisory
CRDA — Converging Runway Display Aid
CRT — Cathode Ray Tube
CS/PP — Construction Safety and Phasing Plan
CSA — Communications Service Authorization

CSIS — Centralized Storm Information System
CSO — Customer Service Office
CSR — Communications Service Request
CSS — Central Site System
C/S/S/N — Capacity/Safety/Security/Noise
CTA — Controlled Time of Arrival
CTA — Control Area
CTA/FIR — Control Area/Flight Information Region
CTAF — Common Traffic Advisory Frequency
CTAS — Center — Tracon Automation System
CTMA — Center Traffic Management Advisor
CUPS — Consolidated Uniform Payroll System
CVFR — Controlled Visual Flight Rules
CVTS — Compressed Video Transmission Service
CWA — Clean Water Act
CW — Continuous Wave
CWSU — Central Weather Service Unit
CWY — Clearway

D

DA — Direct Access
DA — Decision Altitude/Decision Height
DA — Descent Advisor
DABBS — DITCO Automated Bulletin Board System
DAIR — Direct Altitude and Identity Readout
DAR — Designated Agency Representative
DARC — Direct Access Radar Channel
dBA — Decibels A-weighted
DBCRC — Defense Base Closure and Realignment Commission
DBE — Disadvantaged Business Enterprise
DBMS — Data Base Management System
DBRITE — Digital Bright Radar Indicator Tower Equipment
DCA — Defense Communications Agency
DCAA — Dual Call, Automatic Answer Device

DCCU — Data Communications Control Unit
DCE — Data Communications Equipment
DDA — Dedicated Digital Access
DDD — Direct Distance Dialing
DDM — Difference in Depth of Modulation
DDS — Digital Data Service
DEA — Drug Enforcement Agency
DEDS — Data Entry and Display System
DEIS — Draft Environmental Impact Statement
DEP — Departure
DEWIZ — Distance Early Warning Identification Zone
DF — Direction Finder
DFAX — Digital Facsimile
DFI — Direction Finding Indicator
DGPS — Differential Global Positioning Satellite (System)
DH — Decision Height
DID — Direct Inward Dial
DIP — Drop and Insert Point
DIRF — Direction Finding
DITCO — Defense Information Technology Contracting Office Agency
DME — Distance Measuring Equipment
DME/P — Precision Distance Measuring Equipment
DMN — Data Multiplexing Network
DNL — Day-- Night Equivalent Sound Level (Also called Ldn)
DOD — Direct Outward Dial
DoD — Department of Defense
DOI — Department of Interior
DOS — Department of State
DOT — Department of Transportation
DOTS — Dynamic Ocean Tracking System
DOTCC — Department of Transportation Computer Center
DSCS — Digital Satellite Compression Service
DSUA — Dynamic Special Use Airspace
DTS — Dedicated Transmission Service

DUAT — Direct User Access Terminal
DVFR — Defense Visual Flight Rules
DVFR — Day Visual Flight Rules
DVOR — Doppler Very High Frequency Omni-- Directional Range
DYSIM — Dynamic Simulator

E

E-MSAW — En-Route Automated Minimum Safe Altitude Warning
EA — Environmental Assessment
EARTS — En Route Automated Radar Tracking System
ECOM — En Route Communications
ECVFP — Expanded Charted Visual Flight Procedures
EDCT — Expedite Departure Path
EFAS — En Route Flight Advisory Service
EFC — Expect Further Clearance
EFIS — Electronic Flight Information Systems
EIAF — Expanded Inward Access Features
EIS — Environmental Impact Statement
ELT — Emergency Locator Transmitter
ELWRT — Electrowriter
EMAS — Engineered Materials Arresting System
EMPS — En Route Maintenance Processor System
EMS — Environmental Management System
ENAV — En Route Navigational Aids
EPA — Environmental Protection Agency
EPS — Engineered Performance Standards
EOF — Emergency Operating Facility
EPSS — Enhanced Packet Switched Service
ERAD — En Route Broadband Radar
ESEC — En Route Broadband Secondary Radar
ESP — En Route Spacing Program
ESYS — En Route Equipment Systems
ESF — Extended Superframe Format
ETA — Estimated Time of Arrival

ETE — Estimated Time En Route
ETG — Enhanced Target Generator
ETMS — Enhanced Traffic Management System
ETN — Electronic Telecommunications Network
EVAS — Enhanced Vortex Advisory System
EVCS — Emergency Voice Communications System

F

FAA — Federal Aviation Administration
F&E — Facilities and Equipment
FAAAC — FAA Aeronautical Center
FAACIS — FAA Communications Information System
FAATC — FAA Technical Center
FAATSAT — FAA Telecommunications Satellite
FAC — Facility
FAF — Final Approach Fix
FAP — Final Approach Point
FAPM — FTS2000 Associate Program Manager
FAR — Federal Aviation Regulation
FAST — Final Approach Spacing Tool
FATO — Final Approach and Take Off
FAX — Facsimile Equipment
FBO — Fixed Base Operator
FBS — Fall Back Switch
FCC — Federal Communications Commission
FCLT — Freeze Calculated Landing Time
FCOM — FSS Radio Voice Communications
FCPU — Facility Central Processing Unit
FDAT — Flight Data Entry and Printout (FDEP) and Flight Data Service
FDE — Flight Data Entry
FDEP — Flight Data Entry and Printout
FDIO — Flight Data Input/Output
FDIOC — Flight Data Input/Output Center
FDIOR — Flight Data Input/Output Remote

FDM — Frequency Division Multiplexing
FDP — Flight Data Processing
FED — Federal
FEIS — Final Environmental Impact Statement
FEP — Front End Processor
FFAC — From Facility
FIFO — Flight Inspection Field Office
FIG — Flight Inspection Group
FINO — Flight Inspection National Field Office
FIPS — Federal Information Publication Standard
FIR — Flight Information Region
FIRE — Fire Station
FIRMR — Federal Information Resource Management Regulation
FL — Flight Level
FLOWSIM — Traffic Flow Planning Simulation
FMA — Final Monitor Aid
FMF — Facility Master File
FMIS — FTS2000 Management Information System
FMS — Flight management System
FNMS — FTS2000 Network Management System
FOD — Foreign Object Debris
FOIA — Freedom Of Information Act
FONSI — Finding of No Significant Impact
FP — Flight Plan
FRC — Request Full Route Clearance
FSAS — Flight Service Automation System
FSDO — Flight Standards District Office
FSDPS — Flight Service Data Processing System
FSEP — Facility/Service/Equipment Profile
FSP — Flight Strip Printer
FSPD — Freeze Speed Parameter
FSS — Flight Service Station
FSSA — Flight Service Station Automated Service
FSTS — Federal Secure Telephone Service

FSYS — Flight Service Station Equipment Systems
FTS — Federal Telecommunications System
FTS2000 — Federal Telecommunications System 2000
FUS — Functional Units or Systems
FWCS — Flight Watch Control Station

G

GA — General Aviation
GAA — General Aviation Activity
GAAA — General Aviation Activity and Avionics
GADO — General Aviation District Office
GCA — Ground Control Approach
GIS — Geographic Information System
GNAS — General National Airspace System
GNSS — Global Navigation Satellite System
GOES — Geostationary Operational Environmental Satellite
GOESF — GOES Feed Point
GOEST — GOES Terminal Equipment
GPRA — Government Performance Results Act
GPS — Global Positioning System
GPWS — Ground Proximity Warning System
GRADE — Graphical Airspace Design Environment
GS — Glide Slope Indicator
GSA — General Services Administration
GSE — Ground Support Equipment

H

HAA — Height Above Airport
HAL — Height Above Landing
HARS — High Altitude Route System
HAT — Height Above Touchdown
HAZMAT — Hazardous Material
HCAP — High Capacity Carriers

HLDC — High Level Data Link Control
HDME — NDB with Distance Measuring Equipment
HDQ — FAA Headquarters
HELI — Heliport
HF — High Frequency
HH — NDB, 2kw or More
HI-- EFAS — High Altitude EFAS
HOV — High Occupancy Vehicle
HPZ — Heliport Protection Zone
HSI — Horizontal Situation Indicators
HUD — Housing and Urban Development
HWAS — Hazardous In-- Flight Weather Advisory
Hz — HERTZ

I

IA — Indirect Access
IAF — Initial Approach Fix
I/AFSS — International AFSS
IAP — Instrument Approach Procedures
IAPA — Instrument Approach Procedures Automation
IBM — International Business Machines
IBP — International Boundary Point
IBR — Intermediate Bit Rate
ICAO — International Civil Aviation Organization
ICSS — International Communications Switching Systems
IDAT — Interfacility Data
IF — Intermediate Fix
IFCP — Interfacility Communications Processor
IFDS — Interfacility Data System
IFEA — In-- Flight Emergency Assistance
IFO — International Field Office
IFR — Instrument Flight Rules
IFSS — International Flight Service Station
ILS — Instrument Landing System

IM — Inner Marker
IMC — Instrument Meteorological Conditions
INM — Integrated Noise Model
INS — Inertial Navigation System
IRMP — Information Resources Management Plan
ISDN — Integrated Services Digital Network
ISMLS — Interim Standard Microwave Landing System
ITI — Interactive Terminal Interface
IVRS — Interim Voice Response System
IW — Inside Wiring

K

Kbps — Kilobits Per Second
Khz — Kilohertz
KVDT — Keyboard Video Display Terminal

L

LAA — Local Airport Advisory
LAAS — Low Altitude Alert System
LABS — Leased A B Service
LABSC — LABS GS-- 200 Computer
LABSR — LABS Remote Equipment
LABSW — LABS Switch System
LAHSO — Land and Hold Short Operation
LAN — Local Area Network
LATA — Local Access and Transport Area
LAWRS — Limited Aviation Weather Reporting System
LBA — Load-Bearing Area
LCF — Local Control Facility
LCN — Local Communications Network
LDA — Localizer Directional Aid
LDA — Landing Directional Aid
LDIN — Lead-- in Lights

LEC — Local Exchange Carrier
LF — Low Frequency
LINCS — Leased Interfacility NAS Communications System
LIS — Logistics and Inventory System
LLWAS — Low Level Wind Shear Alert System
LM/MS — Low/Medium Frequency
LMM — Locator Middle Marker
LMS — LORAN Monitor Site
LOC — Localizer
LOCID — Location Identifier
LOI — Letter of Intent
LOM — Compass Locator at Outer Marker
LORAN — Long Range Aid to Navigation
LPV — Lateral Precision Performance with Vertical Guidance
LRCO — Limited Remote Communications Outlet
LRNAV — Long Range Navigation
LRR — Long Range Radar

M

MAA — Maximum Authorized Altitude
MALS — Medium Intensity Approach Lighting System
MALSF — MALS with Sequenced Flashers
MALSR — MALS with Runway Alignment Indicator Lights
MAP — Maintenance Automation Program
MAP — Military Airport Program
MAP — Missed Approach Point
MAP — Modified Access Pricing
Mbps — Megabits Per Second
MCA — Minimum Crossing Altitude
MCAS — Marine Corps Air Station
MCC — Maintenance Control Center
MCL — Middle Compass Locater
MCS — Maintenance and Control System
MDA — Minimum Descent Altitude

MDT — Maintenance Data Terminal
MEA — Minimum En Route Altitude
METI — Meteorological Information
MF — Middle Frequency
MFJ — Modified Final Judgment
MFT — Meter Fix Crossing Time/Slot Time
MHA — Minimum Holding Altitude
Mhg — MegHERTZ
MIA — Minimum IFR Altitudes
MIDO — Manufacturing Inspection District Office
MIS — Meteorological Impact Statement
MISC — Miscellaneous
MISO — Manufacturing Inspection Satellite Office
MIT — Miles In Trail
MITRE — Mitre Corporation
MLS — Microwave Landing System
MM — Middle Marker
MMC — Maintenance Monitoring Console
MMS — Maintenance Monitoring System
MNPS — Minimum Navigation Performance Specification
MNPSA — Minimum Navigation Performance Specifications Airspace
MOA — Memorandum of Agreement
MOA — Military Operations Area
MOCA — Minimum Obstruction Clearance Altitude
MODE C — Altitude-- Encoded Beacon Reply
MODE C — Altitude Reporting Mode of Secondary Radar
MODE S — Mode Select Beacon System
MOU — Memorandum of Understanding
MPO — Metropolitan Planning Organization
MPS — Maintenance Processor Subsystem (OR) Master Plan Supplement
MRA — Minimum Reception Altitude
MRC — Monthly Recurring Charge
MSA — Minimum Safe Altitude
MSAW — Minimum Safe Altitude Warning

MSL — Mean Sea Level
MSN — Message Switching Network
MTCS — Modular Terminal Communications System
MTI — Moving Target Indicator
MUX — Multiplexor
MVA — Minimum Vectoring Altitude
MVFR — Marginal Visual Flight Rules

N

NAAQS — National Ambient Air Quality Standards
NADA — NADIN Concentrator
NADIN — National Airspace Data Interchange Network
NADSW — NADIN Switches
NAILS — National Airspace Integrated Logistics Support
NAMS — NADIN IA
NAPRS — National Airspace Performance Reporting System
NAS — National Airspace System or Naval Air Station
NASDC — National Aviation Safety Data
NASP — National Airspace System Plan
NASPAC — National Airspace System Performance Analysis Capability
NATCO — National Communications Switching Center
NAVAID — Navigational Aid
NAVMN — Navigation Monitor and Control
NAWAU — National Aviation Weather Advisory Unit
NAWPF — National Aviation Weather Processing Facility
NCAR — National Center for Atmospheric Research; Boulder, CO
NCF — National Control Facility
NCIU — NEXRAD Communications Interface Unit
NCP — Noise Compatibility Program
NCS — National Communications System
NDB — Non-- Directional Radio Homing Beacon
NDNB — NADIN II
NEM — Noise Exposure Map
NEPA — National Environmental Policy Act

NEXRAD — Next Generation Weather Radar
NFAX — National Facsimile Service
NFDC — National Flight Data Center
NFIS — NAS Facilities Information System
NI — Network Interface
NICS — National Interfacility Communications System
NM — Nautical Mile
NMAC — Near Mid Air Collision
NMC — National Meteorological Center
NMCE — Network Monitoring and Control Equipment
NMCS — Network Monitoring and Control System
NOAA — National Oceanic and Atmospheric Administration
NOC — Notice Of Completion
NOTAM — Notice to Airmen
NPDES — National Pollutant Discharge Elimination System
NPE — Non-primary Airport Entitlement
NPIAS — National Plan of Integrated Airport Systems
NPRM — Notice of Proposed Rulemaking
NR — Non-Rulemaking; refers to a type of airport airspace analysis case
NRA — Non-Rulemaking Airport; refers to a type of airport airspace analysis case
NRC — Non-- Recurring Charge
NRCS — National Radio Communications Systems
NSAP — National Service Assurance Plan
NSRCATN — National Strategy to Reduce Congestion on America's Transportation Network
NSSFC — National Severe Storms Forecast Center
NSSL — National Severe Storms Laboratory; Norman, OK
NTAP — Notices To Airmen Publication
NTP — National Transportation Policy
NTSB — National Transportation Safety Board
NTZ — No Transgression Zone
NWS — National Weather Service
NWSR — NWS Weather Excluding NXRD

NSWRH — NWS Regional Headquarters
NXRD — Advanced Weather Radar System

O

OAG — Official Airline Guide
OALT — Operational Acceptable Level of Traffic
OAW — Off-- airway Weather Station
ODAL — Omnidirectional Approach Lighting System
ODAPS — Oceanic Display and Processing Station
OEI — One Engine Inoperative
OEP — Operational Evolution Plan / Partnership
OFA — Object Free Area
OFDPS — Offshore Flight Data Processing System
OFT — Outer Fix Time
OFZ — Obstacle Free Zone
OM — Outer Marker
OMB — Office of Management and Budget
ONER — Oceanic Navigational Error Report
OPLT — Operational Acceptable Level of Traffic
OPSW — Operational Switch
OPX — Off Premises Exchange
ORD — Operational Readiness Demonstration
OTR — Oceanic Transition Route
OTS — Organized Track System

P

PABX — Private Automated Branch Exchange
PAD — Packet Assembler/Disassembler
PAL — Planning Activity Level
PAM — Peripheral Adapter Module
PAPI — Precision Approach Path Indicator
PAR — Precision Approach Radar
PAR — Preferential Arrival Route

PATWAS — Pilots Automatic Telephone Weather Answering Service
PBB — Passenger Boarding Bridge
PBCT — Proposed Boundary Crossing Time
PBRF — Pilot Briefing
PBX — Private Branch Exchange
PCA — Positive Control Airspace
PCC — Portland Cement Concrete
PCM — Pulse Code Modulation
PDAR — Preferential Arrival And Departure Route
PDC — Pre-Departure Clearance
PDC — Program Designator Code
PDR — Preferential Departure Route
PDN — Public Data Network
PFC — Passenger Facility Charge
PGP — Planning Grant Program
PIC — Principal Interexchange Carrier
PIDP — Programmable Indicator Data Processor
PIM — Preformed Thermoplastic Markings
PIREP — Pilot Weather Report
PMS — Program Management System
POLIC — Police Station
POP — Point Of Presence
POT — Point Of Termination
PPIMS — Personal Property Information Management System
PR — Primary Commercial Service Airport
PRI — Primary Rate Interface
PRM — Precision Runway Monitor
PSDN — Public Switched Data Network
PSN — Packet Switched Network
PSS — Packet Switched Service
PSTN — Public Switched Telephone Network
PTC — Presumed-to-Conform
PUB — Publication
PUP — Principal User Processor

PVC — Permanent Virtual Circuit
PVD — Plan View Display

Q

QA — Quality Assurance

R

RAIL — Runway Alignment Indicator Lights
RAPCO — Radar Approach Control (USAF)
RAPCON — Radar Approach Control (FAA)
RATCC — Radar Air Traffic Control Center
RATCF — Radar Air Traffic Control Facility (USN)
RBC — Rotating Beam Ceilometer
RBDPE — Radar Beacon Data Processing Equipment
RBSS — Radar Bomb Scoring Squadron
RCAG — Remote Communications Air/Ground
RCC — Rescue Coordination Center
RCF — Remote Communication Facility
RCCC — Regional Communications Control Centers
RCIU — Remote Control Interface Unit
RCL — Radio Communications Link
RCLR — RCL Repeater
RCLT — RCL Terminal
RCO — Remote Communications Outlet
RCU — Remote Control Unit
RDAT — Digitized Radar Data
RDP — Radar Data Processing
RDSIM — Runway Delay Simulation Model
REIL — Runway End Identification Lights
RF — Radio Frequency
RIWS — Runway Incursion Warning Systems
RL — General Aviation Reliever Airport
RMCC — Remote Monitor Control Center

RMCF — Remote Monitor Control Facility
RML — Radio Microwave Link
RMLR — RML Repeater
RMLT — RML Terminal
RMM — Remote Maintenance Monitoring
RMMS — Remote Maintenance Monitoring System
RMS — Remote Monitoring Subsystem
RMSC — Remote Monitoring Subsystem Concentrator
RNAV — Area Navigation
RNP — Required Navigation Performance
ROD — Record of Decision
ROSA — Report of Service Activity
ROT — Runway Occupancy Time
RP — Restoration Priority
RPC — Restoration Priority Code
RPG — Radar Processing Group
RPZ — Runway Protection Zone
RRH — Remote Reading Hygrothermometer
RRHS — Remote Reading Hydrometer
RRWDS — Remote Radar Weather Display
RRWSS — RWDS Sensor Site
RSA — Runway Safety Area
RSAT — Runway Safety Action Team
RSS — Remote Speaking System
RT — Remote Transmitter
RT & BTL — Radar Tracking And Beacon Tracking Level
RTAD — Remote Tower Alphanumerics Display
RTCA — Radio Technical Commission for Aeronautics
RTP — Regional Transportation Plan
RTR — Remote Transmitter/Receiver
RTRD — Remote Tower Radar Display
RTTF — Residential Through-the-Fence
RVR — Runway Visual Range
RW — Runway

RWDS — Same as RRWDS
RWP — Real-time Weather Processor

S

S/S — Sector Suite
SAC — Strategic Air Command
SAFI — Semi Automatic Flight Inspection
SALS — Short Approach Lighting System
SAS — Safety Assessment Screening
SATCOM — Satellite Communications
SAWRS — Supplementary Aviation Weather Reporting System
SBGP — State Block Grant Program
SCC — System Command Center
SCVTS — Switched Compressed Video Telecommunications Service
SDF — Simplified Direction Finding
SDF — Software Defined Network
SDIS — Switched Digital Integrated Service
SDP — Service Delivery Point
SDS — Switched Data Service
SEL — Single Event Level
SELF — Simplified Short Approach Lighting System With Sequenced Flashing Lights
SFAR-- 38 — Special Federal Aviation Regulation 38
SHPO — State Historic Preservation Officer
SIC — Service Initiation Charge
SID — Station Identifier
SID — Standard Instrument Departure
SIGMET — Significant Meteorological Information
SIMMOD — Airport and Airspace Simulation Model
SIP — State Implementation Plan
SM — Statute Miles
SMGC — Surface Movement Guidance and Control
SMPS — Sector Maintenance Processor Subsystem
SMS — Safety Management System

SMS — Simulation Modeling System
SNR — Signal-- to-- Noise Ratio, also: S/N
SOC — Service Oversight Center
SOAR — System of Airports Reporting
SOIR — Simultaneous Operations On Intersecting Runways
SOIWR — Simultaneous Operations on Intersecting Wet Runways
SRAP — Sensor Receiver and Processor
SRM — Safety Risk Management
SRMD — Safety Risk Management Document
SSALF — SSALS with Sequenced Flashers
SSALR — Simplified Short Approach Lighting System
SSB — Single Side Band
STAR — Standard Terminal Arrival Route
STD — Standard
STMUX — Statistical Data Multiplexer
STOL — Short Takeoff and Landing
SURPIC — Surface Picture
SVCA — Service A
SVCB — Service B
SVCC — Service C
SVCO — Service O
SVFO — Interphone Service F (A)
SVFB — Interphone Service F (B)
SVFC — Interphone Service F (C)
SVFD — Interphone Service F (D)
SVFR — Special Visual Flight Rules

T

T1MUX — T1 Multiplexer
TAAS — Terminal Advance Automation System
TAC — Technical Advisory Committee
TACAN — Tactical Aircraft Control and Navigation
TACR — TACAN at VOR, TACAN only
TAF — Terminal Area Forecast, Terminal Aerodrome Forecast

TARS — Terminal Automated Radar Service
TAS — True Air Speed
TATCA — Terminal Air Traffic Control Automation
TAVT — Terminal Airspace Visualization Tool
TCA — Traffic Control Airport or Tower Control Airport
TCA — Terminal Control Area
TCACCIS — Transportation Coordinator Automated Command and Control Information System
TCAS — Traffic Alert And Collision Avoidance System
TCC — DOT Transportation Computer Center
TCCC — Tower Control Computer Complex
TCE — Tone Control Equipment
TCLT — Tentative Calculated Landing Time
TCO — Telecommunications Certification Officer
TCOM — Terminal Communications
TCS — Tower Communications System
TDPC — Touchdown/Positioning Circle
TDLS — Tower Data-Link Services
TDMUX — Time Division Data Multiplexer
TDWR — Terminal Doppler Weather Radar
TELCO — Telephone Company
TELMS — Telecommunications Management System
TERPS — Terminal Instrument Procedures
TFAC — To Facility
TH — Threshold
TIMS — Telecommunications Information Management System
TIPS — Terminal Information Processing System
TL — Taxilane
TLOF — Touchdown and Liftoff Area
TMA — Traffic Management Advisor
TMC — Traffic Management Coordinator
TMC/MC — Traffic Management Coordinator/Military Coordinator
TMCC — Terminal Information Processing System
TMCC — Traffic Management Computer Complex

TMF — Traffic Management Facility
TML — Television Microwave Link
TMLI — Television Microwave Link Indicator
TMLR — Television Microwave Link Repeater
TMLT — Television Microwave Link Terminal
TM&O — Telecommunications Management and Operations
TMP — Traffic Management Processor
TMS — Traffic Management System
TMSPS — Traffic Management Specialists
TMU — Traffic Management Unit
TODA — Takeoff Distance Available
TOF — Time Of Flight
TOFMS — Time of Flight Mass Spectrometer
TOPS — Telecommunications Ordering and Pricing System
TORA — Take-off Run Available
TNAV — Terminal Navigational Aids
TR — Telecommunications Request
TRACAB — Terminal Radar Approach Control in Tower Cab
TRACON — Terminal Radar Approach Control Facility
TRAD — Terminal Radar Service
TRB — Transportation Research Board
TRNG — Training
TSA — Taxiway Safety Area
TSEC — Terminal Secondary Radar Service
TSP — Telecommunications Service Priority
TSR — Telecommunications Service Request
TSYS — Terminal Equipment Systems
TTMA — TRACON Traffic Management Advisor
TTY — Teletype
TVOR — Terminal VHF Omnidirectional Range
TW — Taxiway
TWEB — Transcribed Weather Broadcast
TWR — Tower (non-controlled)
TY — Type (FAACIS)

U

UAM — Urban Air Mobility
UAS — Uniform Accounting System
UHF — Ultra High Frequency
URA — Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
USAF — United States Air Force
USC — United States Code
USOC — Uniform Service Order Code

V

VALE — Voluntary Airport Low Emission
VASI — Visual Approach Slope Indicator
VDME — VOR with Distance Measuring Equipment
VF — Voice Frequency
VFR — Visual Flight Rules
VGSI — Visual Glideslope Indicator
VHF — Very High Frequency
VLF — Very Low Frequency
VMC — Visual Meteorological Conditions
VNAV — Visual Navigational Aids
VON — Virtual On-net
VOR — VHF Omnidirectional Range
VOR/DME — VHF Omnidirectional Range/Distance Measuring Equipment
VORTAC — VOR collocated with TACAN
VOT — VOR Test Facility
VP/D — Vehicle/Pedestrian Deviation
VRS — Voice Recording System
VSCS — Voice Switching and Control System
VTA — Vertex Time of Arrival
VTAC — VOR collocated with TACAN
VTOL — Vertical Takeoff and Landing
VTS — Voice Telecommunications System

W

WAAS — Wide Area Augmentation System
WAN — Wide Area Network
WC — Work Center
WCP — Weather Communications Processor
WECO — Western Electric Company
WESCOM — Western Electric Satellite Communications
WHA — Wildlife Hazard Assessment
WHMP — Wildlife Hazard Management Plan
WMSC — Weather Message Switching Center
WMSCR — Weather Message Switching Center Replacement
WSCMO — Weather Service Contract Meteorological Observatory
WSFO — Weather Service Forecast Office
WSMO — Weather Service Meteorological Observatory
WSO — Weather Service Office
WTHR — "Weather"
WX — Weather

Z

ZEV — Zero Emissions Vehicle

INDEX

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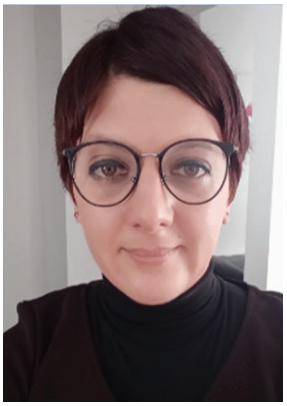

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FROM REVIEWS

The textbook follows content and language integrated approach and communicative syllabus based on functions and integrated language skills (reading, vocabulary, grammar, translation) with different opportunities for practicing speaking and writing through specific tasks, assignments and discussion points. As activities and language skills in each of the thematic units indicate, the priority in this textbook is given to fluency and practice of using language in different contexts that are essential for the highly sensitive role that aviation English plays in people's everyday life and domain-specific contexts, including the context during the COVID-19 pandemic. The strength of this textbook is in the integrative approach through the use of specific tasks and assignments that ties together all language skills, including grammar and vocabulary, so that language skills are not dealt with in isolation from each other.

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Kalajdžisalihović and Naumoska have shared with us much of their aviation English knowledge and teaching experience. Their effort to generate this textbook and make personal contributions to the aviation industry and its culture is noble and brave. Noble, because it is an interesting, contemporary, and useful source of information and activities which can be utilized for various purposes in teaching and learning aviation English. Brave, because compiling this textbook is a massive task which may have required a large team of experts. The authors have embraced the challenges and produced a valuable resource which deserves to be published and utilized in instruction.

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