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Manual on the Implementation of ICAO Language Proficiency Requirements

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AMENDMENTS

The issue of amendments is announced regularly in the *ICAO Journal* and in the monthly *Supplement to the Catalogue of ICAO Publications and Audio-visual Training Aids*, which holders of this publication should consult. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

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FOREWORD

Safety experts are constantly seeking to identify means of improving safety in order to reduce the already low accident rates. With mechanical failures featuring less prominently in aircraft accidents, more attention has been focussed in recent years on human factors that contribute to accidents. Communication is one human element that is receiving renewed attention.

In 1998, the ICAO Assembly, taking note of several accidents and incidents where the language proficiency of pilot and air traffic controller were causal or contributory factors, formulated Assembly Resolution A32-16 in which the ICAO Council was urged to direct the Air Navigation Commission to consider, with a high level of priority, the matter of English language proficiency and to complete the task of strengthening the relevant provisions of Annex 1 — *Personnel Licensing* and Annex 10 — *Aeronautical Telecommunications*, with a view to obligating Contracting States to take steps to ensure that air traffic control personnel and flight crews involved in flight operations in airspace where the use of the English language is required are proficient in conducting and comprehending radiotelephony communications in the English language.

Subsequently, the Air Navigation Commission established the Proficiency Requirements in Common English Study Group (PRICESG) to assist the Secretariat in carrying out a comprehensive review of the existing provisions concerning all aspects of air-ground and ground-ground voice communications and to develop new provisions as necessary. In March 2003, the Council adopted amendments to Annex 1, Annex 6 — *Operation of Aircraft*, Annex 10, Annex 11 — *Air Traffic Services*, and the Procedures for *Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444) relating to language proficiency in international civil aviation.

In order to support States' efforts to comply with the strengthened provisions for language proficiency, the development and publication of guidance material compiling comprehensive information on a range of aspects related to language proficiency training and testing were seen as necessary. While the ICAO Language Proficiency Requirements were developed for use in assessing language proficiency in all languages used for radiotelephony communications, not just in the English language, much of the focus of this manual is on English language training issues, as this is the area in which most States and aircraft operators require specific guidance. The principles, however, are largely transferable to other language training programmes as well.

The purpose of this manual is not to provide a comprehensive language learning education to language instructors or training programme developers, nor to provide a curriculum — tasks well beyond the scope of this document given the breadth of language training and testing activities required — but rather to serve as a guide. The target audience for this manual includes the training managers of civil aviation administrations, the airline industry, and training organizations. The material contained in this manual is drawn from a number of sources and is expressed in ways designed to be accessible to laypersons outside the field of applied linguistics and language teaching. This guidance material is of special interest to aviation specialists who oversee the implementation of appropriate language training and testing programmes.

EXECUTIVE SUMMARY

Chapter 1. Introduction

1. Inadequate language proficiency has played a role in accidents and incidents and led to a review of ICAO language requirements.

   Assembly Resolution A32-16 urged the Council to direct the Air Navigation Commission (ANC) to consider this matter with a high level of priority, and complete the task of strengthening provisions related to the use of the English language for radiotelephony communications.

2. Both ICAO phraseologies and plain language are required for safe radiotelephony communications.

3. ICAO has adopted strengthened language proficiency requirements for radiotelephony communications.

4. All States and organizations have a role to play in improving communications.

Chapter 2. ICAO Standards and Recommended Practices (SARPs) concerning Language Proficiency Requirements

1. The ICAO language proficiency requirements:

   a) strengthen the provisions related to language use in radiotelephony communications, both for the language of the station on the ground and, in airspace where it is required, for English, from the level of Recommendations to Standards;

   b) establish minimum skill level requirements for language proficiency for flight crews and air traffic controllers;

   c) introduce an ICAO language proficiency rating scale applicable to both native and non-native speakers;

   d) clarify the requirement for the use of both plain language and phraseologies;

   e) standardize on the use of ICAO phraseologies;

   f) recommend a testing schedule to demonstrate language proficiency; and

   g) provide for service provider oversight of personnel compliance.

2. Annex 10 SARPs clarify that ICAO phraseologies shall be used whenever possible.

3. Annex 1 SARPs describe how language should be used for radiotelephony communication.

4. The language proficiency requirements in Annex 1 apply equally to native and non-native speakers.

5. Pilots and controllers are required to demonstrate Operational Level 4 language proficiency in the use of both ICAO phraseology and plain language by 2008.

6. A Standard in Annex 1 stipulates recurrent testing for pilots and controllers who demonstrate language proficiency below Expert Level 6.

7. Annexes 6 and 11 stipulate service provider or airline oversight of personnel language proficiency.

Chapter 3. Linguistic Awareness

1. The ICAO language proficiency requirements apply to native and non-native speakers alike.

2. The burden of improving radiotelephony communications should be shared by native and non-native speakers.

   a) States should ensure that their use of phraseologies aligns as closely as possible with ICAO standardized phraseologies.

   b) Pilots and controllers should be aware of the natural hazards of cross-cultural communication.

   c) Native and other expert users of English should refrain from the use of idioms, colloquialisms, and other jargon in radiotelephony communications and should modulate their rate of delivery.

   d) Native speakers must ensure that their variety of English is comprehensible to the international aeronautical community.

   e) Plain language should be specific, explicit, and direct.

   f) English-speaking organizations, airlines or training centres may wish to explore how they might provide cost-efficient English language learning opportunities to code share partners and other airlines at minimal cost.

Chapter 4. Language Training and Radiotelephony Communications

1. An important first step in the establishment of efficient and cost-effective language learning programmes is the selection of appropriately and adequately qualified teachers.

   a) Learning a language is a great deal more complex than the familiar use of our own native language in our daily lives often leads us to believe.

   b) Language teaching is a professional activity that requires specialized training and is further distinguished from other teaching activities because of the unique nature of language learning: a complex blend of skill, knowledge and cultural awareness, combining physical components with mental and communicative processes.

   c) A chart outlining appropriate qualifications for a language training and testing specialist is provided in this chapter.

2. Aeronautical subject matter experts (SME) should collaborate with language teachers to develop accurate and effective programmes.

a) The SME can ensure accurate and appropriate training content, and the language teacher can ensure that delivery focusses on language learning.

b) The task of *teaching* language classes or developing appropriate language learning materials should be guided by language teaching experts and material developers.

3. Flight crews and air traffic controllers need to acquire phraseologies, but aviation English training should not be limited to phraseologies.

4. Language proficiency is an intricate interplay of knowledge, skills, and competence, requiring much more than memorization of vocabulary items.

5. Many factors influence the language learning process. It is difficult to predict how long any particular individual will require to reach the ICAO Operational Level 4 proficiency; as a general rule of thumb, between 100 and 200 hours of language learning contact hours are required for *measurable* improvement. This number can be reduced by involvement in specific-purpose classes which focus solely on speaking and listening.

6. There are no short cuts in language learning. Time, motivation, and mature effort are always required.

7. Adherence to the standards set by a number of professional language teaching associations best guarantees effective programmes.

Chapter 5. Compliance with ICAO Language Proficiency Requirements

1. Until 5 March 2008, States may continue to use the procedures they currently have in place to assess the English proficiency of flight crews and controllers.

2. The relative facility to assess proficiency at the expert level allows flexibility in the way the assessment is made.

3. Licensing authorities should require a specialized evaluation (or test) of those who do not demonstrate Expert proficiency.

4. Phraseologies-only testing is not appropriate.

5. Demonstration of actual speaking and listening ability is required.

Chapter 6. Aviation Language Testing

1. Language testing in aviation has high stakes because careers and safety are at stake.

a) Language testing is a specialized professional activity.

b) Language testing is, on the whole, an unregulated industry.

c) General lack of awareness of the professional requirements for language testing, combined with the high-stakes nature of language testing, might present a risk if inadequately prepared tests are used.

2. Tests prepared by people who do not have the specialized knowledge and experience possessed by language testing professionals may be adequate for placing someone within a training programme or for judging student progress, but the need for the reliability and validity of language proficiency tests in an aviation context is very high.

   a) With careers and possibly lives at stake, administrations should turn to language testing professionals in order to ensure that the tests used or developed for compliance with the ICAO language proficiency requirements will provide reliable and valid results.

   b) A code of ethics and a sample code of practice to guide test development are provided in Appendix D to this manual.

   c) All participants and stakeholders — testers, test developers, and test users — involved in aviation language testing have the responsibility to ensure that the language proficiency tests they select, provide, or develop for the aviation industry are valid, reliable, effective and appropriate.

   d) Test developers, administrators and providers, in particular, are accountable to the stakeholders: to the pilots and controllers taking their tests; to the airlines and air navigation service providers contracting for the testing, and to the passengers relying on the individual language skills of the airline pilots and air traffic controllers.

3. Testing services, rather than “a test”, are required.

4. Direct, communicative proficiency tests of speaking and listening abilities are appropriate assessment tools for the aviation industry and will allow organizations to determine whether flight crews and air traffic controllers are able to meet the ICAO language proficiency Standards.

   a) The ICAO language proficiency requirements point towards an aviation context for testing.

   b) Phraseologies-only testing is not appropriate.

   c) Indirect tests of grammatical knowledge, reading or writing are not appropriate.

   d) Tests that test proficiency in another specific-purpose context (academics or business) are not appropriate.

Chapter 7. Aviation Language and Aeronautical Radiotelephony Communicative Language Functions

1. There are three distinct roles of language as a factor in aviation accidents and incidents.

   a) Use of phraseologies;

   b) Proficiency in plain language;

   c) Use of more than one language.

2. The following information and material in Appendix B will support curriculum development for aviation language programmes:

   a) Aeronautical communicative language functions;

b) Inventory of events and domains;

c) Priority lexical domains;

d) Aviation language tasks.

Chapter 8. Additional Support for Teaching and Learning

Chapter 8 contains three brief articles directed, in turn, to aviation language teachers, material developers, and to pilots and air traffic controllers.

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Chapter 1

INTRODUCTION

Key concepts

- Inadequate language proficiency has played a role in accidents and incidents.
- Both ICAO phraseologies and plain language are required for safe radiotelephony communications.
- ICAO has adopted strengthened language proficiency requirements for radiotelephony communications.
- All States and organizations have a role to play in improving communications.

1.1 BACKGROUND TO STRENGTHENED ICAO LANGUAGE PROFICIENCY REQUIREMENTS

1.1.1 In three accidents (one collision on the ground, one accident involving fuel exhaustion and one controlled flight into terrain), over 800 people lost their lives. What these seemingly different types of accidents had in common was that, in each one, accident investigators found that insufficient English language proficiency on the part of the flight crew or a controller had played a contributing role in the chain of events leading to the accident. In addition to these high-profile accidents, multiple incidents and near misses as a result of language problems are reported annually, instigating a review of communication procedures and standards worldwide.

1.1.2 Concern over the role of language in these and other aviation accidents and incidents has been expressed from several quarters. Data obtained from the ICAO Accident/Incident Data Reporting System (ADREP) database, the United States' National Transportation and Safety Board reports, and the United Kingdom's Mandatory Occurrence Reporting Systems corroborate that the role of language in accidents and incidents is significant. A number of other fatal and non-fatal accidents appear in the ICAO ADREP which cite "language barrier" as a factor. Additionally, the United Kingdom's Mandatory Occurrence Reporting Systems cite 134 language-related problems in fewer than six years.

1.1.3 Such concern heightened after a 1996 mid-air collision in which 312 passengers and crew members were killed in yet another accident in which insufficient English language proficiency played a role.

Assembly Resolution A32-16

1.1.4 Concern over the role of language in airline accidents led to the 1998 ICAO Assembly Resolution A32-16, in which the ICAO Council was urged to direct the Air Navigation Commission to consider this matter with a high degree of priority, and complete the task of strengthening relevant ICAO

provisions concerning language requirements, with a view to obligating Contracting States to take steps to ensure that air traffic control personnel and flight crews involved in flight operations in airspace where the use of the English language is required are proficient in conducting and comprehending radiotelephony communications in the English language.

Development of the language proficiency provisions

1.1.5 In 2000, the Proficiency Requirements in Common English Study Group (PRICESG) convened for the first time. PRICESG had been established to assist ICAO in advancing the task established by the Air Navigation Commission on language competency, which included, among other elements, the following aspects:

a) carry out a comprehensive review of existing provisions concerning all aspects of air-ground and ground-ground voice communications in international civil aviation, aimed at the identification of deficiencies and/or shortcomings;

b) develop ICAO provisions concerning standardized English language testing requirements and procedures; and

c) develop minimum skill level requirements in the common usage of the English language.

1.1.6 The study group was comprised of operational and linguistic experts with backgrounds in aviation (pilots, air traffic controllers, and civil aviation authority representatives) or aviation English training and applied linguistics, representing Contracting States and international organizations covering most main linguistic areas. The PRICESG met throughout the years 2000 and 2001, presenting the Secretariat with a set of recommendations in the fall of 2001.

1.1.7 Amendments to Annex 10 — *Aeronautical Telecommunications*, Volume II — *Communication Procedures including those with PANS status* and the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444) regarding the harmonization of radiotelephony speech and improvement in the use of standard phraseology, in partial response to the task assigned, became applicable on 1 November 2001. The 33rd Session of the ICAO Assembly (Montréal, September/October 2001) noted that provisions related to language proficiency were being developed and considered that the objective should not be limited to the English language. To complete the assigned task, the Secretariat proposed amendments to the following Annexes and documents:

a) Annex 1 — Personnel Licensing;

b) Annex 6 — Operation of Aircraft;

c) Annex 10 — Aeronautical Telecommunications, Volume II — Communication Procedures including those with PANS status;

d) Annex 11 — *Air Traffic Services*; and

e) Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444).

1.1.8 The proposed amendments to Annexes 1, 6, 10 and 11 and to the PANS-ATM were adopted by the ICAO Council in March 2003.

1.2 REVIEW OF PROVISIONS PRIOR TO ADOPTION OF AMENDMENTS CONTAINING LANGUAGE PROFICIENCY REQUIREMENTS

1.2.1 Previously, two Recommended Practices in Annex 10 and a Standard in Annex 1 comprised the provisions relating to the use of language. In Annex 10, it was recommended that English be made available whenever an aircraft station was unable to communicate in the language used by the station on the ground. There was also an attachment to Annex 10 dealing with specific language issues.

1.2.2 In Annex 1, it was stipulated that air traffic controllers demonstrate knowledge of "the language or languages nationally designated for use in air-ground communications and ability to speak such language or languages without accent or impediment which would adversely affect radio communication".

1.2.3 In addition to the absence of any similar requirements for flight crews, the Standards and Recommended Practices (SARPs) for language proficiency did not provide a clearly defined required proficiency level, making implementation difficult and assessment uneven.

1.2.4 Those early aviation communications specialists who drafted the Annex 10 provisions had hopes that the requirements for pilot and controller communications would be achieved once a "radiotelephony speech" based on simplified English had been developed. Some of the issues addressed have been met through the development of phraseologies; much of the rest has been addressed by the amendments or has been surpassed by advances in linguistic understanding. Linguistic research now makes it clear that there is no "form of speech" more suitable for human communication than natural language. Artificial languages — and there are many — have had little impact in any sphere even decades after their introduction. Computer-aided voice recognition and translation technologies remain unproven, especially in the context of the demand for reliability in aviation. As all other options fall short, natural language continues to be the most reliable and efficient form of human communication.

1.2.5 Although standardized ICAO phraseologies have been developed to cover many circumstances (essentially routine events, but also including some predictable emergencies or non-routine events), no set of phraseologies can fully describe all possible circumstances and responses. Aircraft are flown and controlled by humans, and human behaviour is infinitely variable; the need to communicate an infinite variety of circumstances or nuances will continue. Pilots and air traffic controllers need sufficient language proficiency to manage all of the potential requirements of communications, which can range from routine situations to circumstances not addressed by the limited phraseologies, as well as non-routine situations and outright emergencies. Human language is characterized, in part, by the ability to create new meanings and to use words in novel contexts, a creative and complex function of language which accommodates the complex and unpredictable nature of human interaction, even within the relatively constrained context of aviation communications. There is simply no more suitable form of speech than natural languages for human interactions. Attempts to delimit the scope of a language will always fail at some point, when the need to communicate a new and unexpected situation exceeds the resources of the artificially constrained language.

Summary

1.2.6 The ICAO language proficiency requirements cannot completely eliminate all sources of miscommunication in radiotelephony communications. Rather, the goal is to ensure, as far as possible, that all speakers have sufficient proficiency in the language used to negotiate for meaning, in order to handle non-routine situations. Communication errors will probably never be completely eliminated; however, compliance with the ICAO language proficiency requirements will enable speakers to more readily recognize errors and work towards the successful and safe resolution of misunderstandings.

1.3 CALL FOR CLOSE INTERNATIONAL COOPERATION

1.3.1 Improving communications cannot be seen as an obligation of non-native English-speaking States and personnel alone. All ICAO Contracting States, airlines, service providers, and training organizations have a stake in and an obligation to shoulder a fair share of the burden. There are a number of ways that native English-speaking States, organizations, and personnel can help. The first and easiest measure is for Contracting States to improve their own standards for communications and to align phraseologies closely with ICAO phraseologies (see Chapter 3).

1.3.2 Airlines can assist their code-sharing partners and others in the establishment of high-quality, aviation-specific English programmes, either by providing qualified language training personnel in country or by making English language training available at low cost for international partners at existing training centres. For example, between 1995 and 1997, several North American and European airlines provided intensive, aviation English language training to controllers from the civil aviation authority of one Contracting State. Secondly, a great deal of useful language training material can be developed by modifying existing aviation training products. Organizations can invest in the development of high-quality, aviation-specific English learning products and materials by supporting the efforts of linguists and aviation language specialists to develop high-quality, appropriate, aviation-related English learning materials (see Chapter 4). Products so developed may be made available to learners at cost or for marginal profit. A number of other possible useful measures are outlined in Chapter 3. In short, those native and highly-proficient English-speaking States and organizations, which are naturally at an advantage regarding the provisions for the strengthened use of English, can facilitate the movement towards a safer communication environment by giving assistance to those non-native English-speaking States not so advantaged, and by generally factoring this worldwide need for heightened language proficiency into commercial considerations. An aviation community cooperatively committed to communicating better will fly more safely.

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Chapter 2

ICAO STANDARDS AND RECOMMENDED PRACTICES (SARPS) CONCERNING LANGUAGE PROFICIENCY REQUIREMENTS

Key concepts

- ICAO SARPs related to language proficiency were developed with the assistance of the PRICE Study Group, comprised of an international group of aeronautical and aviation English experts, representing all geographical regions.
- Annex 10 SARPs clarify that ICAO phraseologies shall be used whenever possible.
- Annex 1 SARPs define proficiency requirements.
- The language proficiency requirements in Annex 1 apply equally to native and non-native speakers.
- Pilots and air traffic controllers are required to demonstrate Operational Level 4 language proficiency in the use of both ICAO phraseology and plain language by 2008.
- A Standard in Annex 1 stipulates recurrent testing for pilots and air traffic controllers who demonstrate language proficiency below Expert Level 6.
- Annexes 6 and 11 stipulate service provider or airline oversight of personnel language proficiency.

2.1 INTRODUCTION

2.1.1 The purpose of this chapter is to explain and elaborate on the Standards and Recommended Practices (SARPs) related to language use in aeronautical radiotelephony communications and to provide an explanation of the principles underlying the ICAO language proficiency requirements. The information contained in this chapter is intended to be useful to administrators of civil aviation authorities, airlines, and air traffic service providers. Information specifically relating to the Language Proficiency Requirements — the Holistic Descriptors and Rating Scale — will be of use to training managers, language trainers and assessors.

2.1.2 The SARPs relating to language use for aeronautical radiotelephony communications that were adopted by the ICAO Council in March 2003 are found in Annex 1 — *Personnel Licensing*; Annex 6 — *Operation of Aircraft,* Part I and Part III; Annex 10 — *Aeronautical Telecommunications,* Volume II — *Communication Procedures including those with PANS status*; and Annex 11 — *Air Traffic Services* (see Appendix A).

Annex 1	1.2.9.1 – 1.2.9.7 Appendix (Language Proficiency Requirements) Attachment (Rating Scale)
Annex 6, Part I	3.1.6
Annex 10, Volume II	5.2.1.6.2.1.1 5.2.1.2.1 and 5.2.1.2.2 5.2.1.5.2 – 5.2.1.5.5
Annex 11	2.27.1 and 2.27.2

2.1.3 Other language-related information and guidance material are contained in the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444), Chapter 12, and in the *Manual of Radiotelephony* (Doc 9432) in the Foreword and in Chapter 1, 1.2. In summary, the ICAO language proficiency requirements:

- **strengthen** the requirement for English to be provided by air navigation service providers for international flights by upgrading it from the level of a Recommendation to that of a Standard (Annex 10);
- **establish** minimum skill level requirements for language proficiency for flight crews and air traffic controllers (Annex 1);
- **introduce** an ICAO language proficiency rating scale applicable to both native and non-native speakers (Annex 1);
- **clarify** the requirement for the use of both plain language and phraseologies (Annexes 1 and 10);
- **standardize** on the use of ICAO phraseologies (Annex 10);
- **recommend** a testing schedule to demonstrate language proficiency (Annex 1); and
- **provide** for service provider and operator oversight of personnel compliance (Annexes 6 and 11).

2.1.4 The language-related SARPs can be broadly categorized into three types: Annex 10 SARPs clarify which languages can be used for radiotelephony communications; Annex 1 SARPs establish proficiency skill level requirements as a licensing prerequisite; and Annexes 6 and 11 provide for service provider and operator responsibility.

2.1.5 The language requirements and scale were developed for use in assessing speaking and listening proficiency in the particular context of aviation communications. Specifically developed for aeronautical radiotelephony communications, they may find applicability in a wider context within aviation. The requirements were also developed for use in assessing language proficiency in a variety of languages, not just in the English language.

2.2 ANNEX 10 SARPs RELATED TO PROFICIENCY REQUIREMENTS

The SARPs contained in Annex 10, Volume II (reproduced in Appendix A), lay the foundation for the language proficiency requirements, stipulating that English be made available for international radiotelephony communications. The key changes brought about by the Annex 10 amendments were:

a) stipulating the use of ICAO phraseology specifically;

b) clarifying that both phraseology and plain language proficiency are required; and

c) strengthening the provisions that English be made available.

2.3 ICAO PHRASEOLOGY

The first important feature of Annex 10 language-related SARPs is that greater emphasis is placed on the importance of the use of ICAO phraseologies. By clarifying in an ICAO Standard that the use of ICAO phraseologies is required, the need for States and individuals to ensure that their use of phraseology conforms to ICAO phraseology is emphasized. The use of different phraseologies in different geographical areas increases the chances that communications will be misunderstood. This particular danger is aptly illustrated when different but similar phraseologies are used in some regions. Any deviation from ICAO standardized phraseologies presents an obstacle to the best possible communication.

2.4 USE OF PLAIN LANGUAGE

The second sentence in Annex 10, Volume II, 5.1.1.1, establishes as an ICAO Standard what has previously been implicit in a number of ICAO SARPs and explicit in ICAO guidance, i.e. the need for plain language proficiency as a fundamental component of radiotelephony communications. While the Standard in 5.1.1.1 specifies the need for plain language proficiency in addition to phraseologies, it in no way should be interpreted as suggesting that plain language can suffice *instead of* ICAO phraseologies. ICAO phraseologies should always be used in the first instance. The Standard in 5.1.1.1 is unambiguous on the requirement to use ICAO phraseologies in all instances in which they are specified. It is not possible, however, to develop phraseologies to cover every conceivable situation. When plain language is required, it should be delivered in the same clear, concise, and unambiguous manner as phraseologies, for example, in emergencies or unusual situations; to clarify or elaborate on instructions; or when the need to negotiate information or instructions arises. While the Standard in 5.1.1.1 identifies and formalizes the need for the use of plain language, it should in no way be interpreted as a licence to “chat” or otherwise ignore the formal and informal protocols that govern the use of phraseologies. A full examination of the relationship between phraseologies and plain language and an explanation of the intended role of ICAO phraseologies are presented in Chapter 7.

2.5 LANGUAGE TO BE USED

2.5.1 In Annex 10, it is stipulated that radiotelephony communications *shall* be conducted *either* in the language of the station on the ground or in English, and that English *shall* be made available when pilots are unable to use the language of the station on the ground. The upgrading of provisions governing the use of language for radiotelephony communications from a Recommendation to a Standard emphasizes the important link between communications and safety. In Annex 10, in Note 1 to 5.2.1.2.1, it is clarified that the language of the ground station may be different from the national language of the State, and that States in a particular region may also agree that a regional, common language be required. The Standards in 5.2.1.2 mean, in effect, that local, national, and regional languages can be used for radiotelephony communications, but that English shall also always be available at those stations serving routes and airports used by international air services. As an example, Spanish is spoken as the national language in States from Mexico,

through Central America and throughout much of South America. For international flights in such States, Spanish or English can be used, but English must be made available. International pilots flying in this airspace may use either English or Spanish. (The proficiency requirements governing the use of either language are defined in Annex 1.) English has long played the role of a de facto common language for international aviation. The new provisions formalize that role.

> ICAO provisions do not in any way limit the use of a national, regional, or local language but recognize the practical requirement for English to be available for the many pilots who do not speak the national language of a particular State (see also Chapter 7).

Annex 1: SARPs related to proficiency requirements

2.5.2 Provisions governing the use of the language(s) used for radiotelephony communications previously consisted of an Annex 1 Standard requiring that controllers (but not the flight crew) demonstrate knowledge of "the language or languages nationally designated for use in air-ground communications and ability to speak such language or languages without accent or impediment which would adversely affect radio communication". Although the intent of the provisions was clear, explicit guidance, both in the SARPs and in guidance material, is now offered on what the "ability" to speak a language means.

2.5.3 The strengthened language proficiency requirements adopted in 2003 impact on the use of any language used for international radiotelephony communications and clarify what level of proficiency is appropriate. When more than one language can be used for radiotelephony communications, then all languages must be governed by the same proficiency requirements. The requirements also introduce testing requirements that apply equally to flight crew and air traffic controllers, as well as, in varying degrees, to station operators, navigators, and flight engineers. Annex 1 requirements found in 1.2.9 deserve careful examination. Table 2-1 outlines the applicability dates of the provisions.

Paragraphs 1.2.9.1, 1.2.9.2 and 1.2.9.3

2.5.4 The SARPs in 1.2.9.1, 1.2.9.2 and 1.2.9.3, while requiring flight crew and air traffic controllers to demonstrate language proficiency, do not specify a *level* of required proficiency as embodied in the Rating Scale. In essence, the two Standards at 1.2.9.1 and 1.2.9.2 echo the previous provisions in Annex 1 regarding language proficiency, while extending the provisions to most flight crew and some navigators, requiring that they demonstrate the ability to speak and understand whatever language is used for radiotelephony communications. A similar Recommended Practice at 1.2.9.3 refers to the advisability that flight engineers, and glider and free balloon pilots should *have* language proficiency. In these three provisions, a *specific* level of required language is *not* indicated. Guidance on appropriate assessment methods and methodologies can be found in Chapters 5 and 6 of this manual.

Paragraphs 1.2.9.4 and 1.2.9.5: Level 4

2.5.5 Paragraphs 1.2.9.4 and 1.2.9.5 introduce specified proficiency level requirements. These requirements are found in a set of holistic descriptors in the Appendix to Annex 1 and Operational Level 4 in the ICAO Rating Scale contained in the Attachment to Annex 1. Commentary and additional information about the level requirements found in the holistic descriptors and Rating Scale are provided in later sections of this chapter.

2.5.6 Paragraphs 1.2.9.4 and 1.2.9.5 refer to a level of proficiency as described in Level 4 of the Rating Scale. How States ensure that personnel demonstrate proficiency in this case may vary to some extent but, again, must be related to language *proficiency* rather than knowledge *about* language **and**, additionally, must be directly linked to the ICAO Rating Scale. Explicit testing requirements are described in Chapter 6.

2.5.7 Although the heaviest training and testing burden will fall in the area of English-as-a-second-language use, the language proficiency requirements apply to any language used in international aeronautical radiotelephony communications, but not, naturally, to any language used in domestic operations.

Paragraphs 1.2.9.6 and 1.2.9.7: Recurrent testing requirements

2.5.8 The Standard at 1.2.9.6 and the Recommended Practice at 1.2.9.7 support the SARPs in 1.2.9.4 and 1.2.9.5. The Standard at 1.2.9.6 stipulates that personnel who demonstrate language proficiency below Expert Level 6 on the ICAO Rating Scale shall be *formally evaluated* (or tested) at intervals. The Recommended Practice at 1.2.9.7 indicates a schedule for re-testing, and Note 1 clarifies that testing is not required of anyone, native or non-native speaker, who is able to demonstrate language proficiency at Expert Level 6.

2.5.9 As with the study of many other human characteristics, it has proven difficult to isolate and study all of the factors that influence language use: its acquisition, development, or loss. While there is much that is known about human language, there still remain many unanswered questions. One such question concerns language loss. It is known from experience and practical observation that language loss occurs. Deterioration to some degree or another in the language proficiency of individuals who do not use their second or foreign language for a long time is a common experience. What is not known is at what rate such loss occurs, or at what point language loss does not occur. While loss of a second or foreign language is a commonly observed occurrence, people do not normally lose fully acquired first languages (barring disability or injury).

2.5.10 The ICAO minimum proficiency requirements described in Operational Level 4 do not require “native” or “native-like” proficiency. As Operational Level 4 is significantly below Expert Level 6, it can be assumed that language loss can occur in individuals with Level 4 proficiency. Therefore, a Standard *requiring* recurrent language testing and a Recommended Practice *recommending* a schedule for re-testing were introduced into Annex 1.

The ICAO minimum proficiency requirements described in Operational Level 4 do not require “native” or “native-like” proficiency.

2.6 THE ICAO LANGUAGE PROFICIENCY REQUIREMENTS IN ANNEX 1, APPENDIX A

2.6.1 The language proficiency requirements apply to speaking and listening proficiency only and do not address the ability to read or write. The case that pilots and air traffic controllers need reading or writing proficiency to some degree has been made and noted, but at this point in time, speaking and listening proficiency were seen as the areas needing more critical address.

2.6.2 The ICAO Language Proficiency Requirements consist of a set of holistic descriptors (Appendix to Annex 1) and Operational Level 4 of the ICAO Rating Scale (Attachment to Annex 1). Both are reproduced in Appendix A to this manual. Five holistic descriptors provide all-embracing characteristics of proficient speakers and establish some context for communications. The Rating Scale describes the discrete features of language use. ("Holistic" refers to the communicating person as a "whole", in contrast to the descriptors in the Rating Scale which instead examine individual, discrete features of language use.) In some sense, a language proficiency rating scale may be thought of as a guide to good judgement, a first important step towards applying greater consistency worldwide in the language standards to which pilots and air traffic controllers are held.

The holistic descriptors and descriptors in the Rating Scale are designed to convey a notion of a standard to be used as a frame of reference for teachers and assessors to be able to make consistent judgements about pilot and controller language proficiency.

2.7 RADIOTELEPHONE COMMUNICATIONS

Holistic descriptors

2.7.1 *Proficient speakers shall communicate effectively in voice-only (telephone/radiotelephone) and in face-to-face situations*. Radiotelephone communications lack the facial cues, body language, and listening cues found in usual face-to-face situations. Communications without such cues are considered to be more difficult and challenging, requiring a higher degree of language proficiency, than face-to-face interactions. In addition, other features of radiotelephone communications make it a unique kind of communicative event, for example:

— The sound quality may be poor, with distracting sounds.

— The communicative workload of the air traffic controller or a pilot may be heavy, with a corresponding need for efficiency and brevity.

— In addition to their communicative tasks, pilots must also attend to all of the tasks involved in operating their aircraft.

2.7.2 *Proficient speakers shall communicate on common, concrete, and work-related topics with accuracy and clarity.* Context is an important consideration in communications, and an individual's language proficiency may vary in different contexts. This holistic descriptor attempts to limit the domain of the communicative requirements to work-elated topics; that is, air traffic controllers and flight crew personnel are expected to be able to communicate about issues common to their field of workplace knowledge. At the same time, proficiency should not be limited to memorized phraseologies but should range across a relatively broad area of work-related communicative domains. Chapter 7 introduces *many* topics and domains appropriate to the work-related requirements of pilot and air traffic controller communications. It is not a complete and exhaustive list, however, but merely a guide to curriculum development, and the assessment of radiotelephony communications should *not* be limited solely to those topics.

2.7.3 *Proficient speakers shall use appropriate communicative strategies to exchange messages and to recognize and resolve misunderstandings (e.g. to check, confirm, or clarify information) in a general or work-related context.* Strategic competence has been identified by a number of linguists as an important part

of what defines language proficiency or competency. One aspect of strategic competence important to air traffic controllers and flight crews is the ability to recognize and resolve potential misunderstandings, e.g. having strategies to check for comprehension in a meaningful way, such as asking for a read back. Equally important is the ability to rephrase or paraphrase a message when it is apparent that a message was not understood. Sometimes the phraseology "Say again" should be understood as a request for clarification rather than repetition. Air traffic controllers and flight crews should understand that silence does not always indicate comprehension. On the part of native-speaking air traffic controllers and flight crews, strategic awareness can include an appreciation of the threats presented by cross-cultural communications and a sensitivity to strategies to confirm comprehension.

2.7.4 *Proficient speakers shall handle successfully and with relative ease the linguistic challenges presented by a complication or unexpected turn of events that occurs within the context of a routine work situation or communicative task with which they are otherwise familiar.* One of the more challenging events not only in second language use situations but also in all communications is when the unexpected happens. Human Factors experts have emphasized the threat of letting our "expectations" hinder our interpretation of reality. Sometimes, a complication or an unexpected event can lead to a communication breakdown. It is important for air traffic controllers and flight crews to have sufficient language proficiency and the strategic skills to manage a dialogue through any unexpected event. It is the nature of controllers and pilots to adhere to strictly defined procedures and regulations and yet to be able, when confronted with a new situation, to demonstrate substantial flexibility in their response.

2.7.5 *Proficient speakers shall use a dialect or accent which is intelligible to the aeronautical community.* The issue of dialect and accent is very complex and without simple answers, but it is nonetheless manageable at a practical level when common sense and good judgement are applied. A first and natural response to this holistic descriptor is to inquire *which* dialects or accents would be considered intelligible. The best answer is to take a look at how this issue has traditionally been handled among native speaker controller populations. In the United Kingdom, for instance, a great variety of regional dialects and differences exist. Air traffic control applicants and trainees are informally screened for use of a dialect appropriate to the international aviation context. A determination of what constitutes a strong regional dialect or marked accent is based entirely on the extensive experience and good judgement of the trainer or assessor. When an individual demonstrates a strong regional dialect or marked accent, one determined to be easily understood only by those most familiar with the dialect, that individual is counselled to use a dialect more widely acceptable or is provided with additional elocution or speech training. Humans are known to modify speech patterns for any number of reasons, often unconsciously, in order to ensure acceptance into a particular group, in which group identity is marked by use of language in a particular way; or because of the influence of new, regional speech patterns on previously learned patterns, or, particularly in a second language use context, in response to not being understood. Another example of an informal but workable accent or dialect "policy" can be seen in large international English language television or radio news agencies. Broadcasters on international news channels exhibit a range of not only first-language accents and dialects but also second-language English accents, but they are always understood by their audiences. Agencies such as the British Broadcasting Corporation (BBC) or the Cable News Network (CNN) do not have formal policies about acceptable dialects or accents among their broadcasters, at least not publicly available policies, but it is clear that some sort of informal screening for dialects or accents is applied.

Causes of communication breakdown between English-as-a-second-language speakers

2.7.6 In her book *The Phonology of English as an International Language*, the British linguist Jennifer Jenkins has begun the complex task of analysing the causes of communication breakdowns between English-as-a-second-language speakers. While the findings are too extensive to include here, highlighting just a few of the most pertinent research findings is very useful in the context of the communicative needs of

pilots and air traffic controllers. It is important to understand that the traditional models of "native" pronunciation used in many traditional English teaching contexts can no longer be considered valid because the English language cannot be seen as "belonging" to any of the major, traditional, first-language, English-speaking countries. English is a first language or widely used national language in approximately sixty countries and is an important second language in many more countries. There are, in fact, more speakers of English as a second or foreign language than as a first language, and most of the contexts in which English is used occur among two or more speakers of English as a second or foreign language. In this context, in which English has a clear role as an international language, traditional English teaching in which first-language speakers were used as the model for pronunciation no longer makes sense. Most users of English will not be communicating with a native speaker of English but with another English-as-a-second-language speaker, and very few adult language learners achieve so-called "native-like" pronunciation. Part of the importance of the research is to point out that "native-like" pronunciation is not only unlikely but also unnecessary.

2.7.7 Much of the general public attitude to dialect or accent is a matter of bias, with some accents favoured and others perceived negatively. Such bias, however, is attitudinal and not supported by linguistic knowledge; that is, there is no single language or dialect or accent that is inherently better or worse than any other, but popular attitudes to accent variety are difficult to dislodge.

2.7.8 Secondly, it was determined that, in an English-as-a-second-language context, speakers often have a general lack of shared background knowledge. This means that pronunciation becomes even more important when two non-native English speakers are communicating. While "native-like" pronunciation is neither likely nor desirable, mutually comprehensible pronunciation is desirable and, in the context of aviation communications, necessary.

2.7.9 If the "native" speaker as model and judge of appropriate dialect and accent is discarded, then who is eligible, one might ask, to determine intelligibility? If the aeronautical community is considered as one to which an applicant gains admission through the demonstration of any number of competencies determined to be important to the community, then language use is simply another competency. Based on their extensive experience, coupled with some standardized guides to qualifications, pilot and air traffic controller trainers and assessors use good judgement to make decisions regarding the readiness of applicants to enter the field. A similar methodology can be applied to the use of language. The issue of "dialect or accent which is intelligible to the aeronautical community" is indeed a complex issue. It can, however, be managed within the aeronautical community in a similar manner to how native-speaker proficiency has been managed thus far, and how trainers assess other competencies and skills: with common sense and good judgement, coupled with the ICAO Rating Scale as a guide. An additional healthy dose of tolerance for a wide variety of accents and dialects is recommended! (See Chapter 6 for a more complete treatment of language proficiency rating and the role of "guided good judgement".)

2.8 ICAO RATING SCALE

2.8.1 The ICAO Rating Scale contained in the Attachment to Annex 1 delineates six levels of language proficiency ranging from Pre-elementary (Level 1) to Expert (Level 6) across six areas of linguistic description: pronunciation, structure, vocabulary, fluency, comprehension, and interactions. The number of levels was determined as sufficient to show adequate progression in developing language proficiency without exceeding the number of levels between which people are capable of making meaningful distinctions. It is not an "equal interval" scale; the amount of time required to progress between levels will vary, i.e. moving from Elementary Level 2 to Pre-operational Level 3 may take longer or more training than moving from Operational Level 4 to Extended Level 5.

2.8.2 There are essentially two types of language proficiency rating scales: those which use a “can do” approach and those which describe specific features of language use. The ICAO Rating Scale uses the latter approach and is in a form familiar to any professional language teaching or testing specialist (see Chapter 4, Language Training and Radiotelephony Communications, for a description of appropriate qualifications). Nonetheless, a list of language functions and communicative tasks common to controller and pilot communications is also provided as training support in other sections of this manual.

2.8.3 It is important to note that the Rating Scale does not refer to “native” or “native-like” proficiency, a philosophical decision that “native” speech should not be privileged in a global context. All participants in aeronautical radiotelephone communications must conform to the ICAO proficiency requirements, and there is no presupposition that first-language speakers necessarily conform. An additional reason for avoiding the use of the term “native” language or referring to a “native” speaker is because of the proven difficulty in defining just precisely what a native speaker is, a topic well covered in Jenkin’s work. The term “native speaker” is essentially only useful when we are referring to monolingual speakers, that is, to those individuals who speak only one language. However, monolingualism is no longer the norm in the world at large. Bilingualism and multilingualism are conventional in many, if not most, nations and cultures. In a multilingual context, it can become difficult to clarify with precision what is or is not any one individual’s native language because there may legitimately be more than one.

2.8.4 Raters can assume that the descriptors at one level presuppose any skill or feature described in the preceding level. That is, it is assumed that anyone awarded a particular rating level demonstrates proficiency better than the descriptors contained in each level below. Failure to comply with descriptors in one category in one level indicates that the next lower proficiency level should be awarded; i.e. a person’s proficiency rating level is determined by the lowest rating level assigned in any particular category. This is essential because the Operational Level 4 descriptors are developed as the safest *minimum* proficiency skill level determined necessary for aeronautical radiotelephony communications. A lower score on any one feature indicates inadequate proficiency; for example, pilots with Operational Level 4 ratings in all areas except, say, pronunciation may not be understood by the air traffic controllers with whom they must communicate.

An individual must demonstrate proficiency at Level 4 in all categories in order to receive a Level 4 rating.

2.9 ANNEXES 6 AND 11

Standards in Annex 6, Parts I and II, and Annex 11 stipulate that aircraft operators and air traffic service providers must ensure that their personnel comply with the language proficiency requirements as specified in Annex 1.

Table 2-1. Language proficiency requirements — Annex 1 — Applicability dates

These provisions came into effect on 27 November 2003 and are becoming applicable progressively. This progressive application is the result of the Council decision to make the part of the Standard related to testing requirements applicable five years after adoption and of the application of Article 42 of the Convention on International Civil Aviation that provides some "grandfather" rights for existing licence holders.

Air traffic controllers and aeronautical station operators

As of 27 Nov. 2003	Applicants for and holders of an air traffic controller or aeronautical station operator licence shall demonstrate the ability to speak and understand the language used for radiotelephony communications. The Licensing Authority of each ICAO Contracting State determines the way in which the ability is demonstrated.
As of 5 March 2008	The demonstration of the ability to speak and understand the language used for radiotelephony communications shall be done in accordance with the holistic descriptors (Appendix to Annex 1) and the rating scale (Attachment to Annex 1). Those demonstrating language proficiency below the Expert Level (Level 6) will be formally re-evaluated at intervals in accordance with their individual proficiency level. ICAO recommends that the interval be 6 years for those at the Extended Level (Level 5) and 3 years for those at the Operational Level (Level 4).

Aeroplane and helicopter pilots

As of 5 March 2004	Applicants for an aeroplane or helicopter pilot licence shall demonstrate the ability to speak and understand the language used for radiotelephony communications. The Licensing Authority of each ICAO Contracting State determines the way in which the ability is demonstrated.
As of 5 March 2008	Holders of aeroplane or helicopter pilot licences issued before 5 March 2004 shall demonstrate the ability to speak and understand the language used for radiotelephony communications.
As of 5 March 2008	The demonstration of the ability to speak and understand the language used for radiotelephony communications shall be done in accordance with the holistic descriptors (Appendix to Annex 1) and the rating scale (Attachment to Annex 1). Those demonstrating language proficiency below the Expert Level (Level 6) will be formally re-evaluated at intervals in accordance with their individual proficiency level. ICAO recommends that the interval be 6 years for those at the Extended Level (Level 5) and 3 years for those at the Operational Level (Level 4).

Flight navigators: Flight navigators who are required to use the radiotelephone aboard an aircraft shall demonstrate the ability to speak and understand the language used for radiotelephony communications.

Glider and free balloon pilots and flight engineers: There is no language proficiency Standard applicable to these categories of personnel. However, Annex 1, Chapter 1, 1.2.9.3, contains a Recommendation that reads: "*Flight engineers, and glider and free balloon pilots should have the ability to speak and understand the language used for radiotelephony communications.*"

Chapter 3

LINGUISTIC AWARENESS

Key concepts

- The first principle of good radiotelephony technique is adherence to ICAO standardized phraseologies.
- The burden of improving radiotelephony communications should be shared by native and non-native speakers.
- An alert awareness of cross-cultural and cross-linguistic communicative threats is essential to safe radiotelephony communications.
- Pilots and controllers should:
  - avoid jargon, slang, and idiomatic expressions,
  - be clear, concise, and direct, and
  - speak slowly and clearly.
- Native and expert English language speakers can familiarize themselves with the challenges faced by non-native speakers and adopt strategies that facilitate cross-cultural and cross-linguistic comprehension.

3.1 GENERAL

3.1.1 This chapter outlines some key features of language use and communication, highlighting some trigger points for miscommunication, and provides both techniques for improved cross-cultural communication in English between speakers of different native languages and a review of good radio techniques. An awareness of the dangers inherent in voice communications, particularly in cross-cultural communications, will assist native English-speaking air traffic controllers and pilots to more fully appreciate the challenges faced by speakers of English as a second language.

3.1.2 Most humans use language readily and usually successfully without much cognitive knowledge about the nature of language. Because language is mostly unselfconsciously used to accomplish daily tasks, not much thought is given to the actual complexity of language. David McMillan, in his graduate thesis “Miscommunications in Air Traffic Control”, points out that the ease with which we use language(s) to communicate in our daily lives and the usual lack of serious consequences for miscommunication mask the fragility of human language as a vehicle for clear communications. The apparently simple use of language

actually requires a sophisticated interaction of complex processes, and our usually successful daily experience with language belies its complexity. Breakdowns occur for any number of reasons, for example:

— two words may sound the same;

— there may be dramatic pronunciation differences, even among native speakers, which cause miscommunication;

— a speaker's message may be too indirect so that the intent is missed; or

— a speaker may have inadequate familiarity with the language and so is unable to communicate effectively.

In daily life, miscommunication occurs but rarely results in anything other than minor inconvenience, minor embarrassment, or lost time. In air traffic control communications, however, the stakes are dramatically higher and communication errors have the potential for far more serious consequences. Subsequent to an accident in 1977 where miscommunication was identified as a contributing factor, ICAO published changes to phraseologies and procedures based on lessons learned from an analysis of the communications prior to the accident. Nonetheless, miscommunication continues to occur decades later, as numerous incidents and a number of other high-profile accidents in the intervening years attest.

3.1.3 As fraught as natural human language is with error-potential, there is no other communication medium that better serves the purposes of human communication. While data link applications are improving, and some experts hope that they will mitigate the need for a common language, there are reasons why data links will not eliminate the requirement for pilots and controllers to have good language proficiency. Firstly, they are not yet sufficiently developed for universal use in all applications. Secondly, they require language reading proficiency, and translation technology also remains unproven in the face of the rigorous demand for reliability. Finally, flight crews and controllers will always need natural language proficiency in case of data link equipment failure. Alternative measures to circumvent the need for common language proficiency similarly fall short of safety requirements: interpreters on the flight deck or in the control room add an additional layer between the two key agents — controller and pilot — further complicating communication. In routine situations, the use of an interpreter might suffice, but in unusual circumstances or during an emergency, any procedure that slows down communication becomes unacceptably cumbersome and perhaps even dangerous. Therefore, left with human language as our best vehicle for pilot and controller communications, the ICAO language proficiency requirements seek to improve communications to the extent possible.

3.2 NATIVE AND NON-NATIVE SPEAKERS

3.2.1 The ICAO language proficiency requirements apply to native and non-native speakers alike. As English is the most commonly used language for international aviation communications, many non-native speakers of English will require language training to improve their language proficiency. Nonetheless, the burden for improved communications should not be seen as falling solely on non-native speakers. Native speakers of English, too, have a fundamentally important role to play in the international efforts to increase communication safety, and much of the information contained in this chapter is aimed at native speakers interacting with non-native speakers. Improving radiotelephony safety is no small matter, requiring concerted effort and widespread cooperation, and all pilots and controllers will benefit from an improved understanding of how language functions, with a focus on strategies that aid comprehension and clarity. Additionally, an ethical obligation arises on the part of native speakers of English, in particular, to increase their linguistic awareness and to take special care in the delivery of messages.

3.2.2 When the original principles of radiotelephony communication were established, emphasis was placed on the requirement for international cooperation in developing a solution to the problems of voice communication. Although the objectives laid out in the original document have been supplanted by advances in linguistic understanding, the call for close international cooperation remains. The burden can be shared in a number of ways:

a) Contracting States can ensure that their use of phraseologies aligns as closely as possible with ICAO standardized phraseologies.

b) Native and other expert users of English can acquire an awareness of the dangers of, and learn strategies to improve, cross-cultural communications.

c) Native and other expert users of English can refrain from the use of idioms, colloquialisms, and other jargon in radiotelephony communications and can modulate their rate of delivery.

d) Native speakers are under the same obligation as non-native speakers to ensure that their variety of English is comprehensible to the international aviation community.

e) English-speaking organizations can invest in the development of high-quality, aviation-related English language learning materials.

f) Some English-speaking organizations, airlines or training centres may wish to explore how they might provide cost-efficient English language learning opportunities to code share partners or other airlines at minimal cost.

3.2.3 One of the startling aspects of communication errors is that it is one of the few areas which can be readily corrected without high-tech input. Miscommunication can, and does, occur not only between non-native speakers but also between native speakers of the same language. Miscommunication between native speakers can occur as a result of a linguistic error or feature (ambiguity, homophony, etc.) or as a result of human carelessness (poor enunciation, sloppy microphone work, too much data in a single transmission, or impatience), issues we will examine in this chapter. Miscommunication can also occur between non-native speakers or between a native speaker and non-native speaker as a result of these issues, in addition to other sources of error specific to non-native English use.

3.3 ICAO PHRASEOLOGY

3.3.1 For the purposes of the discussion here, it is enough to point out that the introduction of ICAO language proficiency requirements, in which the use of English as the common language of international radiotelephony communications is embodied as an ICAO Standard, offers an opportunity to reinforce strict adherence to standard ICAO phraseology. There is much anecdotal evidence of the difficulties caused by the use of non-standard phraseology, particularly for users of English as a second, or additional, language.

3.3.2 It is vital that both native and non-native speakers conform to ICAO standardized phraseology which has been so carefully and painstakingly developed over the last fifty years. The use of ICAO standardized phraseology is now embodied as an ICAO Standard (Annex 10, Volume II, 5.1.1.1) which reads: “ICAO standardized phraseology shall be used in all situations for which it has been specified. Only when standardized phraseology cannot serve an intended transmission, plain language shall be used”.

3.3.3 Efforts must be made within individual Contracting States to ensure that their use of phraseology conforms specifically to ICAO Standards. At the present time, there are notable differences in a number of States. Let us consider for a moment how the use of non-ICAO phraseologies presents an unnecessary hindrance to safe international operations. The following example was provided by a senior airline authority to a review committee.

> *Consider an aeroplane on an instrument approach in low visibility at a large international airport anywhere in the world. For whatever reason, the captain elects to initiate a go-around while still in the clouds. It is a regulatory requirement that air traffic control be notified as soon as practical that the aeroplane is executing a go-around, but this critical radio transmission to the tower may be phrased in any number of ways depending on the airline or the State of registry of the aeroplane, or for a myriad of other reasons: the pilot could report a "go-around", a "missed approach", a "balked approach", or "abandon approach". If non-standard phrases or jargon are used, an event which unfortunately occurs more often than it should, then the controller and other pilots in the vicinity might hear "we're on the go", or some other regional jargon. In this case, while the actions of the flight crew within the cockpit may be clear and the crew may perform the manoeuvre as a team, their intentions may not be clearly understood by those on the radio frequency, including other aeroplanes in the immediate vicinity as well as the controller responsible for providing separation.*

3.3.4 While perfect communication may never be achieved, communication can be greatly improved by agreeing to use, wherever possible, the same phraseologies. For voice communications to provide the level required for safe operations, the use of a single standardized ICAO phraseology must be emphasized. This may mean a re-orientation for controllers or pilots who may have become accustomed to either non-ICAO phraseologies or, perhaps, a laxity regarding the use of ICAO phraseologies. Those controllers and pilots so affected need simply consider the efforts required by non-native English-speaking counterparts to acquire English language proficiency at the ICAO Operational Level 4 in order to understand the value of conforming to ICAO phraseologies exclusively and of maintaining careful, expert radiotelephony techniques.

3.4 CONCURRENT NEED FOR CAREFUL USE OF PLAIN LANGUAGE

3.4.1 Although the careful use of ICAO phraseologies is one means to increased communication safety, no set of phraseologies, however extensive, can account for the breadth of human communicative need, even within the relatively constrained environment of air traffic control communications. In all those situations for which phraseologies cannot suffice, of urgency, emergency, or other non-routine but normal circumstances, controllers and pilots will use plain language. An example of a normal, non-urgent communication which would require plain language is given in this excerpt from an actual transcript, as two aircraft are descending towards the airfield: "Who's ahead? Us or the Air Europe?" In this case, there appear to be no ICAO phraseologies to cover this request for information. While ICAO phraseologies should always be used in the first instance, there will always be situations, some routine, for which phraseologies do not exist.

3.4.2 The ICAO language proficiency requirements in the Appendix to Annex 1 detail the requisite language characteristics for the use of both phraseologies and plain language. They are intended as guidance on the use of plain language.

3.5 SLANG, JARGON AND IDIOMS

3.5.1 Language communicates more than message content; use of language also communicates, generally on a sub-conscious level, information about group identity, status and rank, emotions, and attitudes. Language also serves to establish relations or to alleviate boredom or stress. Slang, jargon, and idioms are similar in that they consist of words or phrases which have a specialized use, with a significance other than the logical or obvious significance. Slang and jargon have more pejorative connotations, with jargon, associated with professional use of languages, being considered less pejorative; idioms may be relatively free of social connotations.

Jargon

3.5.2 Standardized ICAO phraseology is sometimes referred to as a kind of jargon, a specialized code specific to air traffic controllers and flight crews; yet, as a formalized code, ICAO phraseology does not serve the same function as informal jargon. Rather, phraseology has the specific technical function of ensuring efficient and safe communications. Informal jargon or anything else which may make comprehension more difficult is wisely avoided, given the potential consequences of misunderstandings within the RTF environment.

Idioms

3.5.3 Similar to jargon, but usually without any pejorative connotation, idioms are only understood as a whole phrase, the significance of which is one step removed from any logically derived meaning. An example is “to take off”. It is difficult to see the logical relationship between a plane “taking off” and a person, for example, “taking off” a hat or coat. Similarly, there is nothing inherently logical about using the phrase “can you make the runway?” Although there may not be anything inherently wrong with using such a phrase in the appropriate context, speakers should be aware of the difficulties which second language users may experience in understanding idioms, especially as idioms constitute a large part of our normal communications. Avoiding idioms results in clear and easier-to-understand speech.

3.5.4 Clarity, conciseness, and correctness are goals of air traffic control communications. The purpose of phraseologies is to reduce the possibility for ambiguity and to facilitate efficiency. For all the many circumstances where phraseologies do not apply, the use of plain language should achieve the same goals as phraseology. Avoiding idioms whenever possible and being aware of the difficulty they may present help make plain language clearer. Overall, an awareness of the differences between jargon and idioms and of their sometimes useful but possibly complicating role in communications will help pilots and controllers communicate more safely across linguistic and cultural barriers.

3.6 FUNCTION AND REGISTER

3.6.1 *Be specific, explicit, and direct.* An understanding of the role of language function and register will clarify the importance of using language which is specific, explicit, and direct when communicating

across a linguistic barrier. *A communicative function* relates to the intention of the speaker, expressed by a verb of communication. A speaker can convey an intended function through a variety of language forms. For example, the language function of "requesting an action" could be expressed in any of the following forms:

a) Bring me the file.

b) Could you bring me the file?

c) Would you hand me that?

d) Pass that here.

e) Where is the file?

f) How about that file?

3.6.2 *Register* refers to the differing use of language in differing contexts. For example, a speaker will use one particular register when making formal presentations and another when speaking to close friends or family. Registers are characterized by the use of vocabulary and structural or grammatical differences. The differing forms used in the examples above are governed in part by the register, in decreasingly informal order. Function, form, and register are important concepts for air traffic controllers and pilots to have at least a passing familiarity with because a number of accidents and incidents have been attributed to either a controller or pilot using less direct forms to communicate some concern, which, in part, because of the indirect form, was either misunderstood or ignored. These situations are well covered in textbooks on crew resource management. An example is a co-pilot asking the pilot, "How about those flaps?" to express his concern that the flaps are not far enough extended for take-off. Far better to state concerns explicitly: "We should extend the flaps further" or "Are the flaps extended correctly?"

3.6.3 Utterances should explicitly state the function of the communication, especially when attempting to clarify or alleviate a concern in the mind of the speaker. An example in everyday life is to ask, "Please turn on the lights" rather than a more indirect request, "How about some light?" In air traffic control communications, controllers and pilots can ensure greater clarity with explicit statements. State the topic of concern explicitly. Be direct rather than indirect.

3.7 PRONUNCIATION, DIALECT AND ACCENT

3.7.1 *Clear pronunciation* — In native-speaker to native-speaker communications, speakers can use the context to assist understanding, and it has been common practice for language teachers to encourage students to use context to aid comprehension. Research has found, however, that second language speakers of English rely much more heavily on pronunciation, rather than context, to understand. The implications of this for improving radiotelephony communications are two-fold: the role of pronunciation in the ICAO Language Proficiency Rating Scale must be given high priority, and all speakers must move towards pronunciation patterns acceptable to the larger international aeronautical community. While accent can sometimes be difficult to control, speakers can control intelligibility by moderating the rate of speech, limiting the number of pieces of information per utterance, and providing clear breaks between words and phrases. Speakers should also be careful to avoid the simplification of sound clusters.

3.7.2 *Dialect and accent* are complex issues. A great deal of language teaching has focussed on the "native" speaker as the role model for pronunciation. However, the linguistic community has more recently recognized that the notion of a monolithic native speaker is misleading, as there is a wide variety among

native speaker accents and dialects. This is especially true with English as it continues to be used on a global level. As English becomes an increasingly common international language, any sense of ownership which English-speaking countries may have felt has disappeared. English, perhaps more than any other language, belongs to the world. Those interested in reading more about English as an International Language may refer to the list of references for books and articles which explore this role more fully (see Appendix E).

3.7.3 An example of the important and practical contributions that linguists can make to the field of aviation English training and testing can be found in the consideration of the myth of so-called “standard” dialects. Just as the development of aviation English language training and testing programmes is made more effective and efficient with qualified language teaching professionals at the helm, so too does the issue of dialect highlight the importance of bringing qualified language teaching professionals into assessment activities. The ICAO language proficiency requirements call for proficient speakers to “use a dialect or accent which is intelligible to the aeronautical community”. This can be understood to signal that all speakers, both native and non-native, must take care to acquire an internationally understood accent or dialect. It has been pointed out that the use of a native speaker as a role model for pronunciation not only is misleading (which native speaker variety should you use?) but also sets up learners to fail, as adult language learners do not generally acquire any sort of native — like pronunciation. A better aim for language learners is mutual intelligibility. The question of which accents are intelligible to the international aeronautical community, while difficult on the one hand to answer with precision, points to the legitimate role of “judging” in language assessment. The aeronautical community will use best judgement about appropriate accent and dialect against the background of knowledge and experience in aviation operations. Such informal but informed judgements about accent and dialect are already used in a number of professional applications today, including aviation training.

3.7.4 One example of an effective but unofficial policy on accent and dialect can be seen in the English broadcast news industry. A number of years ago, large television news networks hired individuals speaking only a limited number of so-called “prestige” English dialects. In recent years, however, it is common to hear a much wider range of English dialects and non-native accents among newscasters. Although the news agencies do not appear to have formalized language testing requirements or a formal policy on acceptable accent, some informal policy obviously operates to ensure that newscasters speak a dialect and accent easily understood by the great majority of listeners. English-speaking controller training organizations have traditionally operated in a similar fashion; trainers may note informally through training contact with trainees when someone demonstrates a strong regional dialect, requiring extra training or “elocution” lessons in some cases. In such cases, good judgement was used in determining the appropriate accent. There is no “global English language authority” to establish a single “acceptable” accent. It would not be possible to establish one in any case, for any language, as variety in language use is unavoidable, and language is too complex a phenomenon for linguists to precisely map out which features of language use make it most widely intelligible. Some linguists are researching the issue of intelligibility, but the complexity of the issue makes such research of little practical value at this time. Instead, participants in cross-cultural communications are better served by acquiring an awareness of the challenges of cross-cultural communication, an openness to accommodating different accents and dialects, and techniques for recognizing and negotiating communication breakdowns.

3.8 CROSS-CULTURAL COMMUNICATION

3.8.1 There are a number of features of radiotelephony communication that make it particularly challenging to speakers of English as a foreign language. Firstly, many people consider communicating in another language quite stressful. Speaking a foreign language with a highly proficient or native speaker of the language can be an intimidating experience. Secondly, radiotelephony communication is absent of any

visual clues, making communication even more difficult, since, in face-to-face communications, much is communicated through non-verbal channels, including body language and facial expression. Finally, some studies indicate that stress negatively affects language performance. Flying and controlling aeroplanes are, to some degree, inherently stressful activities. Consequently, flying or controlling an aeroplane while communicating across linguistic barriers on a radiotelephone, devoid of visual clues, brings a number of stress-inducing factors to the communication process.

3.8.2 In this context, if native speakers are simply aware of the challenges faced by speakers of English as a foreign language (EFL), they can take greater care in their speech. Native and highly proficient speakers can, for example, focus on keeping their intonation neutral and calm, admittedly difficult at busy control areas but a good strategy to calm the language anxiety of an EFL speaker. They can take particular care to be explicit, rather than indirect, in their communications and train themselves away from the use of jargon, slang, and idiomatic expressions. They can ask for readbacks and confirmation that their messages have been understood, and they can attend more carefully to readbacks in cross-cultural communication situations, taking greater care to avoid the pitfalls of “expectancy,” a topic well covered in Human Factors literature. Additionally, a slower rate of delivery seems to make speech more comprehensible; therefore, taking care to moderate speech rate is a common sense approach to improving communications.

3.9 SUMMARY

Implementation of the ICAO language proficiency requirements cannot realistically completely eliminate all sources of miscommunication in radiotelephony communications. Rather, the goal is to ensure, as far as possible, that all speakers have sufficient proficiency in the language used to negotiate for meaning. While communication errors will probably never completely go away, disciplined use of ICAO phraseology, compliance with the ICAO language proficiency requirements, alert awareness of the potential pitfalls of language, and an understanding of the difficulties faced by non-native English speakers will enable pilots and controllers to more readily recognize communication errors and work around such errors.

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Chapter 4

LANGUAGE TRAINING AND RADIOTELEPHONY COMMUNICATIONS

Key concepts

- Learning a language is a great deal more complex than the familiar use of our own native language in our daily lives often leads us to believe.
- An important first step in the establishment of efficient and cost-effective language learning programmes is the selection of appropriately and adequately qualified teachers.
- Aeronautical subject matter experts should collaborate with language teachers to develop accurate and effective programmes.
- Aeronautical communication involves more than phraseologies alone.
- Many factors influence the language learning process. It is difficult to predict how long any particular individual will require to reach the ICAO Operational Level 4 proficiency.
- There are no short cuts to language learning. Time, motivation, and mature effort are always required. Well-developed programmes can ensure the best progress through the use of relevant materials and effective methods.
- Adherence to the standards set by a number of professional language teaching associations best guarantees effective programmes.

4.1 INTRODUCTION

The introduction of strengthened ICAO provisions for language proficiency for flight crews and air traffic controllers reinforces the need within the civil aviation industry to ensure the establishment and continued development of effective and efficient language training programmes. Organizations may opt to develop or enhance internal language training programmes, or they may decide to contract with commercial language training organizations to provide the service. The purpose of this chapter is to guide those having responsibility for the development and implementation of language programmes for flight crews and air traffic controllers. This chapter will address teacher qualifications and learner progress. In addition, other topics that will assist States, training establishments, training managers and instructors in the selection or development of suitable training curricula, syllabi and materials will be explored.

4.2 LANGUAGE LEARNING

4.2.1 People tend to have strong opinions about language learning, perhaps because every human being, barring severe disability, speaks at least one language. Yet, language is a great deal more complex than our familiar use of language in our daily lives often leads us to believe. Academic research reveals that a good deal of "common wisdom" about language learning is inaccurate. An example is the commonly held belief that children learn new languages more easily than do adult learners. Findings by language acquisition researchers do not entirely substantiate this; studies indicate that while adolescents show some advantage over both adults and children, given the same set of circumstances (e.g. programme duration, and amount of time spent in language learning activities), adults have learning strategies that afford them better progress than do young children, except in *pronunciation* — early acquisition appears to have beneficial effects. While this is not to say that age does not affect language learning at all, factors other than age — personality, access to the language, or motivation — may have at least as strong an influence.

4.2.2 This is just one example of common wisdom applied to language learning that results in somewhat inaccurate perceptions. Another illustration can be seen in the perception that "anyone who speaks a language can teach a language". Similarly, a bit of wishful thinking applied to language learning sometimes results in learners searching for a "magic bullet", leaving themselves open as possible prey of promoters of so-called "new methods for quick and easy language learning".

Language teaching is a professional activity that requires specialized training.

4.2.3 Contrary to such notions lies reality: language teaching is a professional activity that requires specialized training. Language teaching is further distinguished from other teaching activities because of the unique nature of language learning: a complex blend of skill, knowledge, and cultural awareness, combining physical components with mental and communicative processes. No substitute for effort and time has been found in the endeavour to learn new languages. In fact, the tendency to apply conventional wisdom to language learning issues sometimes results in the assignment of inadequately prepared individuals to the task of developing, implementing or selecting language training programmes. Thus, the resulting inappropriate classroom activities will be inefficient, leaving language learners frustrated and unprepared. Language teachers are facilitators who are trained to effectively communicate how language works, to organize and deliver interesting and engaging lessons, and to accurately assess proficiency. Based on their professional awareness of how humans learn foreign languages, they design classroom activities that encourage and allow the learners to interact with the language.

4.2.4 In contrast to a great deal of traditional language teaching, which focussed on fill-in-the-blank, grammar-type exercises, more recent linguistic and language acquisition research has led to an interest in more student-centred, interactive classroom approaches designed to increase learners' communicative competence in the language. While not ignoring the role of grammatical knowledge, classroom activities focus on providing learners with opportunities to interact with the language in order to engage all of the elements that constitute language use. Activities can include open-ended role plays, missing-gap games, or any meaningful, context-centered activity drawing learners into an active engagement with the language. Grammar teaching in communicative classrooms is done in a meaningful context. One result of incorporating linguistic research into language teaching programmes, besides an arguable improvement to language learning, is that the language learning classroom has become a more interesting, lively, and engaging place to be.

4.3 LANGUAGE TRAINING PROGRAMME DEVELOPER AND INSTRUCTOR QUALIFICATIONS

4.3.1 The notion that “anyone who speaks English can teach English” is incorrect. The research into how humans acquire languages addresses a full range of issues important to the establishment of efficient language training programmes. An appropriately prepared individual familiar with adult language acquisition theories and research, pedagogical innovations, testing doctrine, and linguistic principles can best guide the development of language training programmes in line with current research. Therefore, the first important consideration in the development of efficient and effective language training programmes is the designation of an appropriately prepared individual who can direct the task of cross-cultural issues and who has a commitment to continued professional development, respect for the student, and an ability to engage and motivate students.

The best qualified language programme managers and instructors have an academic background in language teaching; expertise with aviation communications, and communicative language teaching experience, in addition to personal attributes important to teaching: sensitivity to and awareness of cross-cultural issues, a commitment to continued professional development, respect for the student, and an ability to engage and motivate students.

Instructor qualifications

4.3.1.1 *Language acquisition.* Language instructors or language training programme developers need a familiarity with the findings of recent language acquisition research and with current language learning theory. An understanding of how adults acquire a second language, what factors influence language acquisition, and the role of formal instruction in language acquisition are examples of important background knowledge for language instructors.

4.3.1.2 *Linguistics.* Language instructors need to understand basic principles about language and need a cognitive awareness of how language functions. A linguistic awareness, including knowledge of historical influences on a language, allows instructors to respond to student inquiries about the grammatical, lexical and phonological systems. An appreciation of sociolinguistic theory provides insight into the role of dialect and issues of language identity.

4.3.1.3 *Pedagogy.* Language instructors should be familiar with a variety of language teaching methods and techniques, with principles of curriculum development, and with the notions of learner style and motivation. Instructors and curriculum developers should be able to link the approach used to an underlying theory of language and language learning and should be able to design a programme (course objectives, syllabus, activities). Because of the dearth of aviation-specific language learning materials, aviation English teachers should also be adept at developing their own materials.

4.3.1.4 In addition to formal training in the areas listed above, it is important to remember that teaching is a skill in its own right. Effective teachers know how to engage their students; they create learner-centred lessons, monitor their own effectiveness, continue to develop their skills and knowledge professionally, and know about and use a variety of reference and teaching resources.

4.3.1.5 *Language proficiency.* While language instructors naturally will want to have achieved a competent level of proficiency themselves in order to teach effectively, and this level can be established in relation to the level of students they are teaching, there is no reason to suppose that “native” speakers make

better language teachers. Non-native instructors can, for example, bring their first-hand experience of learning a second language to bear on their teaching. Although the ICAO Rating Scale may have applicability in other instances, it was developed specifically with the communicative needs of pilots and air traffic controllers in mind; it does **not** address reading or writing proficiency, or grammatical knowledge, all important skills and knowledge sets for teachers. Other specifically developed rating scales or associated tests may be more beneficial in determining an appropriate level of language proficiency for language instructors.

Teacher preparation programmes

4.3.2 An organization can ensure that language training personnel have expertise in the areas described above by selecting language specialists who typically have graduate-level qualifications in language teaching, several years' experience with adult learners, and familiarity with aviation subject matter. Many English teaching preparatory programmes are available, commonly referred to as Teaching English as a Second Language (TESL), Teaching English as a Foreign Language (TEFL), or Teaching English to Speakers of Other Languages (TESOL). Similar programmes may be known as Foreign Language Education programmes, Second Language Acquisition (SLA) Studies, Second Language Studies, Applied Linguistics programmes, or other language-teaching programmes ("Japanese as a Second Language", for example). In some parts of the world, qualified language teachers earn university degrees in Foreign Language Teaching or Training, with a requirement to master two foreign languages. Such English language teaching preparatory programmes can be found at the certificate, diploma, master's or doctorate levels. Short courses may be offered by a variety of public and private institutions leading to a certificate or diploma. Longer courses are offered by universities leading to a post-graduate certificate in education or a master's degree in, for example, Applied Linguistics or another *closely* related field. Programmes that are *not* closely related but may appear to be so to the lay public include English literature or other language *literature* programmes.

4.3.3 Effective English language training programmes tend to seek instructors who have a combination of an educational background in one of the areas listed above and practical experience in ESL teaching, at an appropriate level, allowing for a certain amount of trade-off between education and work experience: that is, practical and progressively responsible work experience may substitute for advanced educational degrees, particularly when the individuals have been self-motivated to educate themselves about current principles of language teaching and learning. Additionally, less experienced or less well-prepared instructors can be guided under the experienced hand of a supervisor teacher (see Table 4-1).

Differences between certificate, diploma, and master degree programmes

4.3.4 The difference between certificate, diploma, advanced university and master's degree programmes lies mainly in the degree of preparation they offer. The shorter courses, usually certificate programmes, typically offer between 100 and 150 hours of training. A master's degree programme or advanced university degree programme will last one or two years beyond the university bachelor programme. As an example, the TESOL Certificate offered by one British institution is described as a practical, work-related qualification which is a *first* step in learning to teach English to adults. The diploma and master's degree programmes offered at the same institution are described as enabling individuals to take up professional roles in teacher training, management, course design, testing, CALL (computer-aided language learning), and language education research. The British Association of TESOL Qualifying Institutions recommends assigning work and teaching responsibilities in line with an individual's background preparation and experience. In brief, holders of a TESOL Certificate are prepared to teach a class under the careful guidance of a better qualified supervisor; they may or may not be adequately prepared to engage in sustained materials or curriculum development, depending on the amount of experience gained. An

individual with a TESOL Diploma and experience or with a master's degree in TESOL should be able to engage fully in material and programme curriculum development, in the supervision of other instructors, or in programme management.

Aviation content specialization

4.3.5 ESL teachers can best teach aviation English if they are familiar with the content material. They can gain familiarity in a number of ways: by experience in aviation, by experience in aviation English teaching, or through a short course designed to provide such familiarity (a flight ground school course, for example). With an introduction to aviation content, teachers experienced in English for specific purposes should be able to select, modify, and exploit content appropriate to the classroom needs of students. Optimum aviation English training solutions are developed consistently over time, with committed and qualified individuals motivated to stay the long course of aviation English materials development and with continued support from subject matter experts (SME). Because aviation technical familiarity is not gained overnight, more so than in other English language teaching endeavours, organizations will want to invest in talented, capable teachers who will be able to commit to long-term materials development projects.

4.3.6 Alternatively, a very useful aviation English teaching solution is found in the pairing of a qualified English language teacher with an aviation subject matter expert. The role of the SME in the language classroom is to guide the selection of and verify the accuracy of aviation content; the role of the trained language specialist is to arrange for language learning to occur in the context of the aviation content provided by or monitored by the SME. Such partnerships have been found to be among the most effective technical English language teaching approaches.

A subject matter expert alone is not enough

4.3.7 What has **not** been found to be effective is relying on aviation technical experts alone to provide the optimal environment for language learning to occur. While individuals with flight experience or an air traffic control background make valuable (and necessary) subject matter experts to facilitate language teaching, the task of *teaching* language classes or developing appropriate language learning materials should be delegated to language teaching experts and material developers. The role of aviation experts in the aviation language teaching environment is to guide the language teacher towards appropriate content material and to maintain a high degree of technical accuracy in the language learning materials. Aviation experts with instructional experience will make the best "partners", able to contribute most positively to the language training.

Aviation technical experts can support and facilitate aviation English teaching. Language teaching, however, should be conducted by qualified language teachers.

4.3.8 The selection of appropriately and adequately prepared individuals to develop and/or instruct in language training programmes is an important first step in the establishment of efficient and cost-effective programmes. Attempting to economize in the selection of teacher or programme developer is likely to cost far more in the long term than selecting persons who are appropriately qualified. For additional information on programme standards, please refer to Section 4.7 and Appendix D.

Table 4-1. Aviation English Qualifications: A range of qualifications

	Best	*Very good*	*Minimum*
1) Aviation English teacher, administrator, and material developer			
ESL academic qualifications[1]	Master's in Language Teaching: • Teaching English as a Second Language (TESL, TESOL), or • Applied Linguistics, or • Foreign Language Education or related field	• Bachelor's degree in foreign language training, or • Graduate diploma in TESL, etc., or • University degree + extensive ESL teaching experience with clear evidence of commitment to field [2]	• Certificate in TESL, or • University degree (initial teaching should be done under close supervision of experienced teacher)
ESL teaching experience	Aviation English programme 3+ years	• Aviation English programme • English for specific purpose teaching • ESL teaching in an accredited university or language school	• Language teaching experience, or • No previous teaching experience acceptable when teaching under close supervision of experienced teacher
Aviation communications	Pilot or controller experience	Radiotelephony familiarity (through aviation English apprenticeship or experience)[3]	Ability to work well with SME
ESL material development	Aviation English material development with communicative or interactive approach	—	ESL material development with communicative or interactive approach
ESL administrative experience	Aviation English programme administration	ESL programme administration	Aviation or ESL programme involvement
2) Language test *development* [4]			
Academic[5]	Ph.D. in Applied Linguistics with specialization in language testing	Master's in Applied Linguistics + experience developing, and conducting research on, second/foreign language tests	Master's in Applied Linguistics or TESOL + ability to work with other experts
Aviation	—	Radiotelephony familiarity	Ability to work well with SME
3) Subject matter experts			
Aviation communications	Professional, *international*, radiotelephony experience (professional pilot or controller)[6]	Highly experienced commercial or private pilots with *international* experience	Licensed pilot with *international* awareness
4) Other possible aviation English team members			
Computer-aided training and instructional design[7]	Professional specialist academic qualifications	Extensive and proven specialist experience	Specialist experience

1. The usual academic qualification required for native English-speaking teachers across North America, Western Europe, Australia and New Zealand is a master's degree in Teaching English as a Second Language (TESL) or some other closely related field, such as Applied Linguistics. In other parts of the world (e.g. Russia, Eastern Europe, and much of Asia), the academic qualification to become a language teacher is usually a bachelor's degree in foreign language training. One advantage that teachers from such programmes have is that they have succeeded in attaining a rigorously high degree of language proficiency in at least one foreign language, and often two.

   Other "language-related" academic fields (such as English Literature, Comparative Literature, Communications, Translation/Interpretation studies, Comparative Linguistics or "pure" Linguistics) do not focus on language teaching or language learning and are not relevant qualifications for language teachers. Similarly, while some ESL teaching degrees are housed in education departments, other fields of academic education, such as Education, Educational Technology, International Studies, and Cross-cultural Studies, are not directly related to language teaching.

   Additional qualifications include cross-cultural expertise or sensitivity, international work experience, multilingualism, second language *learning* experience, and, of course, an enthusiasm for teaching.

2. The field of English as a Second Language is relatively new, with higher degree programmes only developing in the 1970s and later. A number of excellent teachers entered the field in the 1970s before the existence of such programmes but have pursued professional development through other means, evidenced through, for example, membership in professional associations, published research or presentations, and professional self-development in the field.

3. Radiotelephony familiarity is essential for aviation English teaching. ESL teachers can gain familiarity with radiotelephony communications through a variety of means: by taking flight lessons or observer flights; through an apprenticeship with an aviation English master teacher; through experience in teaching aviation English; through interactions with professional aviators and controllers, through reading widely and other self-educational schemes; and through the use of simulators and software programmes. When ESL instructors do not have aviation English familiarity, it is important that they work closely with a subject matter expert.

4. The qualifications for test interlocutors and raters are naturally different from those necessary for test development team members and leaders. Training in test familiarity and rater calibration is necessary for all interlocutors and raters. See Chapter 4 for more information on rater qualifications.

5. The higher the stakes of a test event, the more important the input of highly qualified and experienced experts in test development.

6. *International* experience is important because international radiotelephony communication is often different from local communication practices. Most importantly, knowledge of ICAO phraseology is essential.

7. In the development of aviation English materials, whether they be text-based materials or a computer-aided medium, a qualified and experienced ESL teacher or material developer is an essential part of the team. Instructional design technology expertise is an important part of a material developing team but does not substitute for the language learning knowledge that an ESL specialist brings.

4.4 CONTENT: GENERAL AND AVIATION-SPECIFIC ENGLISH LANGUAGE TRAINING

4.4.1 A second consideration in the establishment, development, or selection of language programmes addresses content and methodology. After careful selection of language teaching and programme management personnel, the next decision will concern what should be taught and how. Organizations wishing to provide language training programmes for personnel will have the option of developing and offering their own programmes or contracting with an outside agency to provide courses, or a combination of both. Regardless of the option chosen, the content of the courses in the programme, the curriculum, and the methodological approach are important.

4.4.2 English for specific purposes (ESP) is an approach to language teaching that focusses programme content on subjects, topics, and issues of direct interest to learners. ESP training is driven by what learners need *to do* in English and focusses principally on those features of the language which are required to undertake a particular task. A more narrowly focussed, learner-centred approach to teaching English, ESP aims to help learners establish partial competence in a given, usually work-specific domain, such as (broadly) science, technology, or medicine, or (more narrowly) banking, mechanical engineering, or aviation. English for aviation learning and teaching activities focus on the language needed to function in various aviation contexts.

The role of phraseologies — A cautionary note

4.4.3 What is the relationship of aviation English and phraseologies to “general” English? It may be useful to consider aviation English, radiotelephony English, and phraseologies as increasingly smaller subsets within the larger category of “the English language”.

- *Aviation English.* We can define aviation English as a comprehensive but specialized subset of English related broadly to aviation, including the “plain” language used for radiotelephony communications when phraseologies do not suffice. Not restricted to controller and pilot communications, aviation English can also include the use of English relating to any other aspect of aviation: for example, the language needed by pilots for briefings, announcements, and flight deck communication; or the language used by maintenance technicians, flight attendants, dispatchers, or managers and officials within the aviation industry.

- *Radiotelephony English (RTFE).* A sub-category of aviation English, radiotelephony English is the language used in radiotelephony communications. It includes but must not be limited to ICAO phraseology and can require the use of “general” English at times. A list of pilot and controller language functions found in Appendix B elaborates the use of radiotelephony English. “Plain language” refers most often to what we are calling here radiotelephony English but also may require “general” English.

- *ICAO phraseology.* The standardized words and phrases approved for radiotelephony communications by ICAO have been developed over years and represent a very narrow, specialized and rigid subset of language.

4.4.4 A more thorough discussion on aviation English can be found in Chapter 7; it should be emphasized here that flight crews and air traffic controllers need to acquire phraseologies, certainly, but aviation English training should not be limited to phraseologies. Language proficiency is an intricate interplay of knowledge, skills, and competence, requiring much more than memorization of vocabulary items. Memorization of ICAO phraseologies alone does not constitute language proficiency and is an

unsafe practice. Aviation English training for flight crews and air traffic controllers, then, necessarily includes practice with phraseologies but also necessarily includes a broader focus on aviation-related English.

Memorization of ICAO phraseologies alone does not constitute language proficiency and aviation English training should not be limited to phraseologies.

The role of "general" English

4.4.5 If we keep in mind that specialized aviation English is built upon proficiency in general English and that individuals entering the aviation environment with a high level of proficiency in "general" English (native speakers and/or expert users of the language) readily acquire the specialized English vocabulary and phraseologies needed for efficient and safe radiotelephony communication, it is reasonable to expect that "general" English programmes and courses may be an appropriate preface to learning aviation English, at the lower levels. This is to say that "general" English programmes and learning activities can play a valuable role and are a legitimate language learning activity for flight crews and controllers. This is important in part because much support for "general" English learning exists: many programmes, instructors, texts, and multimedia products are readily and economically available to support general English learning.

The case for aviation English — Safety and efficiency

4.4.6 As has been shown, there is a role for "general" English teaching and learning. However, a strong case for aviation-focussed English language teaching and learning at all skill levels presents itself, based on the safety-related objectives and learner motivation. As increased air safety is the motivating factor beneath any initiative, including the establishment of provisions for language proficiency in civil aviation, it is important that language training programmes address appropriate needs within the domain of aviation operational communications. Aviation English specialists, individuals with the requisite applied linguistic background as described above, as well as an earnest familiarity with or experience in the requirements of aviation communications, can best and most efficiently achieve an organization's safety-related language proficiency objectives.

A case study

4.4.7 As an example of the insight that linguists can bring to bear on our understanding of aviation communications and the consequential implications for training is the case of a message uttered by the first officer in one of the two aircraft involved in a catastrophic collision. His use of the phrase "we are now at take-off" was interpreted by the aerodrome controller to mean that the aircraft was waiting at the take-off point. Subsequent events demonstrated that the first officer in fact meant that the aircraft had already started the take-off roll. Linguistic analysis of this accident customarily attributes the ambiguity of the phrase to linguistic interference from the speaker's mother tongue which allowed the use of a preposition (equivalent to English "at") associated with the infinitive form of a verb to express the notion of an action being performed at the moment of speaking. This is not the case in English. The data in this case certainly support the notion that a better mastery of basic English syntax by the first officer at that moment in time would have helped to alert the controller to the impending collision. However, a closer look at the problem raises certain doubts about how clear-cut this solution actually is. The English language does in fact allow phrases on the model AT + NOUN to express the notion that the speaker is currently participating in an activity (consider for

example “at play”, “at work”, “at lunch”). To extend this language pattern to the action “take-off” is therefore not entirely unreasonable. What was missing in the first officer’s knowledge/use of English was the awareness that such phrases may sit astride a semantic “fault-line” (CURRENT ACTION vs. CURRENT POSITION) which is of critical importance to the specific domain of aircraft movements on the ground. The problem here is that without this domain-specific knowledge, a teacher of general English may see no urgent reason to focus attention on the ambiguity of phrases like “at take-off”. This is all the more true since teachers of the general language tend to focus their corrections on the major areas of grammatical usage (overall sentence structures, verb-tense contrasts, etc.).

4.4.8 In addition to specific cases, anecdotal feedback from controllers involved in communications-related incidents has drawn attention to the more general problem of the impact of general language training from an intermediate level upwards. It would seem that by focussing on some of the finer points of grammar or the lexicon (vocabulary) during training, non-native users of English can become inappropriately concerned with manipulating certain features of the language and are thus hampered in their ability to use the language clearly and rapidly in operational situations. It would therefore appear that attainment of a recognized level of “general” English will fail to meet the requirements for safe communications in that they may be either insufficient with regard to the specific constraints pertaining to the context of aircraft operations or in excess of operational linguistic needs and, as such, potentially disruptive to safe communications.

4.4.9 Indeed, in support of the case and anecdotal evidence described above, some language researchers contend that “general” language competence does not exist, that language proficiency always occurs in context, and that language competence exists only in specific contexts.

The second case for aviation English — Learner motivation

4.4.10 Aviation English learning activities, focussed on work-related tasks, will be of high interest to the learner, increasing learner motivation. For busy professionals, especially those who have already acquired basic proficiency in English, lessons and learning activities focussed on the language they need on the job will be seen as more efficient. As a cautionary note, however, it should be understood that aviation English is not a magic bullet; aviation English learning will not necessarily be a faster method of learning the appropriate English. However, it will likely more readily engage the learner, keeping motivation high.

Content-based language learning

4.4.11 Content-based language learning may be a solution for organizations wishing to optimize economy of training costs by integrating other aviation training needs with language training. Evidence that incorporating subject matter content into language learning activities, or using language learning as a vehicle for learning content, has pedagogical merit, not only from the point of view of improved language acquisition, but also as regards learner motivation. Content-based language instruction is appropriate to aviation professionals because the language becomes the vehicle for learning meaningful and appropriate content; language learning is not seen as auxiliary to other aviation training, but as integrated with aviation training.

Implementation of aviation content-based language programmes

4.4.12 The implementation of content-based language programmes for flight crews and air traffic controllers can be accomplished through a collaboration between ESL-certified language specialists and aviation specialists. Such classes may be co-developed, and even co-taught, with the ESL specialists

providing linguistic support to the aviation content. Appropriate classroom activities of an aviation content-based language programme will be familiar to Crew Resource Management trainers: a focus on task-based activities, problem-solving, team-building exercises, role play and simulations.

4.5 BASIC PRINCIPLES OF LANGUAGE LEARNING

4.5.1 There has been a great deal of research in linguistics and language acquisition, with many professional organizations, university programmes, seminars, books and journals devoted to language acquisition and teaching, particularly to the teaching of English as a second language. See Appendix E for a listing of useful and readily available resources. This section aims to outline some very basic precepts about language learning in order to guide language programme administrators in establishing reasonable expectations and programme guidelines. Beyond the basic information provided here, a language specialist with a broad background can apply research more readily to individual organizational contexts.

Expected learner progress: ESP is not a short cut

4.5.2 The selection of course content is important; for aviation professionals, ESP or content-based language instruction is the most appropriate and more efficient and effective approach. It should be made very clear, however, that such courses do not represent a short cut to language competence. Outside of academia, language training providers often encounter unrealistic expectations on the part of clients and sponsors who want short-term language training solutions, a “magic bullet” for language learning. Language learning activities can certainly be more or less effective, but there are simply no magic, quick-and-easy language learning techniques or programmes to substitute for a serious and mature commitment of time and effort. To understand why promises of miraculous language learning are always false, consider that even if it were possible to memorize many words in a short space of time (with boredom as only one of the long-term drawbacks of this method), the ability to say something is only one part of what it means to speak a language. Weeks spent memorizing a large number of words or phrases does not prepare learners to understand all that they may hear. Learning a language involves not only learning how to say something but also understanding what you hear.

Expected learner progress

4.5.3 It is very important for programme sponsors and managers to have a realistic sense of what is considered as usual progress in language learning. It should be noted at the outset that any guide to expected progress can only be very general, as learner progress is affected by any number of factors and will be highly individual. Language learning is a complex interaction of a number of factors, involving academic linguistic knowledge, cultural information, and communicative skills. Some of the factors influencing the rate of language learning include the following:

- *Environment.* One of the major factors influencing language learning progress appears to be environment. More specifically, research suggests language learning in an “immersion” or Target-Language (TL) environment is more effective and efficient than language learning in an isolated environment; that is, learning English in an English-speaking host country is effective.

- *Time.* Time spent on language learning tasks has an obvious impact. The more time individuals are immersed in language learning activities, the more quickly they acquire language skills.

- *Personality.* While it is not possible to generalize the effect of personality on language learning, evidence suggests that certain personality traits which facilitate language learning might increase an individual's success, e.g. being unafraid of appearing foolish and being willing to take risks.

- *Learner style.* Researchers have concluded that learners differ in their preferred learning styles and make better progress when the methodology used matches their preferred learning style. Programmes can accomplish this by offering an array of learning options, e.g. computer-aided self-access programmes, classroom activities, role plays and simulations.

- *First language literacy and educational background.* The degree of literacy of learners in their first language will impact learner style and the degree to which classroom materials are a help or a hindrance to learning.

- *Motivation.* Learners with intrinsic (internal) motivation may learn more efficiently than learners with purely external motivating factors.

4.5.4 Other factors include a learner's current level of language proficiency, attitude to the target language culture, study habits, and the degree of cultural isolation.

How long does it take?

4.5.5 Students and administrators often want to know, "how long will it take" for a student to progress from point A to point B. Clearly, in consideration of the large number of factors which impact language learning, it is impossible to predict with great accuracy how long any one individual will require. However, some general guidelines can be drawn from research and from practical experience. One informal rule of thumb in the field of language teaching for academic purposes holds that between 100 and 200 hours of language learning activities are required for any *measurable* improvement in ability. One large professional association which regulates language institutes asserts that "it is not unrealistic to expect students who begin at the lowest levels to require a full calendar year of intensive language study to reach levels of proficiency sufficient to begin academic work" (NAFSA Principles, from the Association of International Educators). A full year of intensive language study would equal approximately 1 000 to 1 400 hours of study.

4.5.6 Additional research from the United States Defence Language Institute, an organization with many years' experience teaching pilots and air traffic controllers, indicates that approximately 16 weeks of intensive study focussing solely on listening and speaking proficiency, or approximately 500 hours of study, are required for a language learner to move from a level 1 to a level 2 on the Defence Language Institute's Inter-agency Language Roundtable (ILR) scale.

4.5.7 What can be drawn from this evidence is that tightly focussed, aviation-specific speaking and listening curricula will likely produce more efficient results than more generalized approaches.

4.6 ROLE OF COMPUTER-BASED PROGRAMMES

The role of computers in language learning, like the role of computers in other kinds of learning and training situations, is relatively new and likely to increase. The important point to remember, however, is that language is essentially about communication. The computer is another tool to support training, not a new way of training. To the extent that computers can mimic the human ability to interact and communicate, as

well as provide learners with the opportunity to practice the language on their own (self-access activities), computers have an obvious value. Computers can facilitate live, human teacher-to-student interaction but may not yet be able to replicate interaction that requires speaking as well as listening ability, particularly in the context of aviation communications.

4.7 PROGRAMME STANDARDS: WIDE VARIETY IN PROGRAMME QUALITY

Whether organizations elect to develop their own, internal English language programme or to subcontract with a third-party language training provider, initial and ongoing programme evaluation will be an important aspect of quality control. Chapter 6 outlines a set of professional standards that ensure quality. In selecting a language training provider, it is important to note that English language teaching is very much an unregulated industry, with only very recent efforts being made to accredit English language teaching programmes in Europe, the United States and Canada. There is no universal licencing examiner authority regulating language teacher training or certification, and there is wide variety in programme and teacher quality. As the foundation for programme quality, English language teaching programmes should adhere to standards established for this purpose by a number of professional associations as outlined broadly in this chapter. (Appendix D contains additional information on programme standards.)

4.8 ADDITIONAL FACTORS

4.8.1 Some additional factors that affect programme quality concern instructor work environment, particularly instructor responsibilities. Because aviation English teaching is so highly technical and specialized, an English-as-a-second-language instructor needs a somewhat lengthy apprenticeship in order to gain familiarity with the technical requirements of radiotelephony communications. There are relatively few English teachers prepared to manage the technical requirements of teaching pilots and air traffic controllers. When an organization has access to such instructors, their value to the organization should not be underestimated, as they may be difficult to replace.

4.8.2 Reasonable teaching loads can range from a usual academic load of twelve to fifteen hours per week for instructors who manage administrative, research, curricular or other duties, to twenty hours per week for instructors without research or significant administrative responsibilities beyond usual class preparation and student counselling duties, to as many as twenty-five hours per week for instructors who are working with fully prepared curricula and class materials and who carry no material development, class preparation, or any other administrative responsibilities.

4.8.3 Time built into the year for professional development activities, to carry out research or attend seminars or conferences, keeps instructors abreast of current research and enthusiastic about their teaching.

4.9 SUMMARY OF BEST PRACTICE IN AVIATION LANGUAGE TRAINING

There are many variables in language learning progress and wide programme quality in a largely unregulated industry. Clients and students of the academic or “general purpose” language teaching community at large may be able to afford a wide range of programme quality, as they face fewer time constraints and are generally in the early part of a career path. However, professionals within the aviation community affected by the ICAO language proficiency requirements are in the middle of their careers and face rigid time pressures; they need to attain ICAO Operational Level 4 language proficiency as quickly as possible. As such, the aviation industry merits the most efficient language training available.

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Chapter 5

COMPLIANCE WITH ICAO LANGUAGE PROFICIENCY REQUIREMENTS

Key concepts

- Until 5 March 2008, States may continue to use procedures they currently have in place to assess English proficiency of flight crews and controllers.
- The relative facility to assess proficiency at the expert level allows flexibility in the way the assessment is made.
- Licensing authorities should require a specialized evaluation (or test) of those who do not demonstrate Expert proficiency.
- Phraseologies-only testing is not appropriate.
- Demonstration of actual speaking and listening ability is required.

5.1 INTRODUCTION

5.1.1 The purpose of this chapter is to provide guidance to State aviation authorities, airlines, air navigation service providers (ANSPs), and training establishments on the various ways to ensure compliance with the ICAO language proficiency requirement. It covers three major topics:

a) Compliance with Annex 1 Standards 1.2.9.1 and 1.2.9.2 (general proficiency requirements that do not refer to the level of the rating scale);

b) Demonstration of proficiency at the expert level; and

c) Demonstration of proficiency at Levels 4 and 5.

5.1.2 While the evaluation of language proficiency according to the ICAO language proficiency rating scale is only required as of 5 March 2008, there are good reasons to start formal evaluation of language proficiency earlier:

a) *Recruitment.* It is likely that most air traffic service providers and airlines will want their new recruits to meet the language proficiency requirements as a prerequisite for recruitment;

b) *Benchmarking.* The establishment of the training programme required to bring existing staff to the appropriate level would require an accurate assessment of the level of language proficiency of existing staff; and

c) *Deadline.* To be prepared for the 5 March 2008 deadline.

5.2 COMPLIANCE WITH ANNEX 1 STANDARDS 1.2.9.1 AND 1.2.9.2

5.2.1 Even before the introduction of the ICAO requirements, most States had established procedures to ensure that flight crews had knowledge of the English language before being allowed to fly in airspace where English was required. Similarly, States have typically had measures to ensure English language proficiency in air traffic controllers. Any measures or procedures to ensure compliance with Annex 1 Standards 1.2.9.1 and 1.2.9.2 that are not based on the ICAO proficiency scale and holistic descriptors will have to be replaced by 5 March 2008 when Annex 1 Standards 1.2.9.4 and 1.2.9.6 become applicable. Until then, States can continue to use existing measures, keeping in mind that speaking and listening proficiency in both phraseologies and plain language should be assessed.

5.2.2 These existing procedures will continue to be appropriate for glider and free balloon pilots and flight engineers according to the Recommended Practice in Annex 1, 1.2.9.3. Additional guidance on appropriate language assessment methods and methodologies is found in Chapter 6.

5.3 DEMONSTRATION OF PROFICIENCY AT THE EXPERT LEVEL

5.3.1 Language proficiency at “both ends” of a proficiency scale is relatively easy to discern. It is not difficult to recognize “Expert” or “native” or “native-like” proficiency, and for that reason the assessment at Level 6 does not necessarily need to be carried out by a language testing specialist. Native speakers of the language should be considered expert speakers provided they use a dialect or accent that is intelligible to the aeronautical community. Expert speakers also include multilingual speakers who include the language as one of their “native” languages, and foreign-language speakers who have acquired Expert proficiency, through either educational background, extensive work experience in the language, or some other extensive contact with the language. Recognition of “Expert” proficiency can be based on the documentation of such experiences, or it can occur during training or as part of the evaluation of training. The person responsible for documenting “Expert” language proficiency does not need to be a specialist but should be familiar with the relevant applicable Standards and should be able to recognize when there is a need to refer the applicant to specialized language testing.

5.3.2 Although the relative facility to assess proficiency at the Expert level allows flexibility in the way the assessment is made, the demonstration of language proficiency is an element of the formal process that leads toward the issuance of a pilot or an air traffic controller licence. It is therefore important that each State establish appropriate procedures and ensure that the results of the assessment are properly documented, whether done through specialized testing, through the documentation of appropriate experience in the language, or on the basis of observation of Expert proficiency during training.

5.4 DEMONSTRATION OF PROFICIENCY AT LEVELS 4 AND 5

5.4.1 Between the two poles of “Expert” and “Pre-elementary” proficiency, it becomes more difficult to distinguish between levels, and so, formalized, professional assessment is required both for the initial assessement as well as for the recurrent evaluation required under Annex 1, 1.2.9.6. Licensing authorities should require a specialized evaluation (or test) of those who do not demonstrate Expert proficiency. Such speakers may include native speakers who demonstrate a regional dialect or accent that is not readily intelligible to the international aeronautical community; speakers who demonstrate a speech impediment; or foreign-language speakers with less than Expert proficiency.

5.4.2 It is useful to understand the circumstances into which the ICAO language proficiency requirements have been introduced, in the context of English language testing and training. Without an ICAO Standard clarifying the level of proficiency required, it has been difficult for the industry to invest in English language training. As a result, the ICAO SARPs concerning language proficiency requirements introduce a need for high-quality and aviation-specific language training materials and programmes beyond what is currently available and call for the development of academically sound, high-quality, aviation-appropriate language testing services. Chapter 6 will review, in detail, the issue of aviation language testing.

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Chapter 6

AVIATION LANGUAGE TESTING

Key concepts

- The ICAO language proficiency requirements point towards an aviation context for testing.
- Phraseologies-only testing is not appropriate.
- Proficiency tests of actual speaking and listening ability are required.
- Indirect tests of grammatical knowledge, reading, or writing are not appropriate.
- Tests which test proficiency in another specific-purpose context (academics or business) are not appropriate.
- "General purpose" proficiency tests may be appropriate in some contexts, but professional pilots and controllers should be tested on their work-related language proficiency.
- "General purpose" or language tests developed for other purposes may be useful for pre-training assessment or for pre-screening.
- For licensing purposes, a test must evaluate proficiency according to the criteria established in the ICAO language proficiency requirements.
- Computers are currently better suited to facilitate the delivery and administration of language proficiency tests than to rating or assessment in the high-stakes aviation context.

6.1 INTRODUCTION

6.1.1 The purpose of this chapter is to provide guidance to State aviation authorities, airlines, air navigation service providers (ANSPs), and training establishments in the selection or development of suitable, effective language tests as States seek to comply with ICAO language proficiency and testing requirements. A particular objective of this chapter is to help ensure that the language assessment measures and language tests developed for the civil aviation industry are reliable, valid, and practical.

6.1.2 SARPs in Annex 1 require that flight crews and controllers demonstrate language proficiency at the ICAO Operational Level (Level 4). Annex 11 and Annex 6 assign responsibility to air traffic services providers and aircraft operators, respectively, to ensure that their personnel meet ICAO language proficiency requirements. Testing serves two purposes: it fulfils ICAO provisions requiring that pilots and controllers demonstrate language proficiency sufficient for safe and efficient radiotelephony communications, and it provides benchmarks by which the effectiveness of language training and language learning may be evaluated.

6.1.3 Improving radiotelephony communications requires three things: ICAO setting proficiency requirements; good quality, aviation-specific language training programmes; and appropriate assessment tools or tests. The language proficiency requirements in the Appendix to Annex 1 establish the minimum skill level requirements and the SARPs in Annex 1, Section 1.2.9, establish testing requirements. The establishment of testing *procedures* is addressed by the ICAO provisions in so far as they stipulate that speaking and listening proficiency must be evaluated, and not, for example, reading ability, grammatical knowledge, or vocabulary in isolation of context. While the ICAO language proficiency requirements establish testing requirements, the development of tests and testing procedures is left to States, airlines, and training organizations, with the State Aviation Authorities maintaining oversight responsibility. However, language speaking *proficiency* tests require that certain specific procedures be used, and this requirement will guide the implementation or development of tests for aviation language proficiency.

6.2 TEST OVERVIEW

6.2.1 It is misleading to talk about “a test” or “the test” for aviation language proficiency assessment. Rather, what is needed are testing *services* which can provide the ongoing development of any number of tests for the industry, with ongoing and continual development of new items for different versions of a number of tests. A need for language testing may occur at a number of points in time in the career of a pilot or air traffic controller: as a screen for pre-training selection; for diagnostic purposes or as a progress check during training; or as a licensing requirement in fulfilment of ICAO Annex 1 requirements. Different tests will be needed at different points in the training process: for example, language tests for ab initio pilot and controller trainees will necessarily be different from a language test targeting the specific-purpose language skills of professional pilots and controllers.

6.2.2 Tests can be categorized as high stakes depending on how significantly they impact the life of the candidate or other stakeholders. When the results of a particular test determine or limit professional and career options, the stakes are high for the candidates. As an example, a single classroom test developed by a classroom teacher in a course which provides multiple assessment opportunities will have less long-term impact on the life of the candidate than will a comprehensive exam, the results of which will determine whether the candidate graduates or not. In such a case, the comprehensive exam can be considered as a high-stakes exam, while the single classroom test would not qualify.

6.2.3 The development of appropriate language testing and assessment options for the aviation industry is a matter of particular importance for two reasons: language testing within the aviation industry is a case of very high-stakes testing, and the language test industry is a relatively unregulated industry.

6.3 HIGH STAKES

6.3.1 A number of factors make language proficiency testing for compliance with ICAO Annex 1 licensing requirements a case of exceptionally high-stakes testing.

6.3.2 *Safety.* The safety of airline passengers depends in no small measure on the effectiveness of pilot and air traffic controller communications. When radiotelephony communications are in English, then it is quite obvious that the English language proficiency of the participants needs to be sufficient; this is the rationale underlying ICAO language proficiency requirements for **all** languages used for international radiotelephony communications. Reliable, effective, legitimate testing systems are required to ensure that pilots and controllers have adequate levels of English language proficiency.

6.3.3 *Career.* The outcome of the language test will impact on the career of pilots and controllers. Pilots and controllers operating internationally need to demonstrate compliance with the ICAO language proficiency requirements. Those who do not may be denied a licence to operate internationally, a consequence which can have severe professional repercussions not only on the career of an individual pilot or controller but also on an airline or air traffic service provider.

6.3.4 *Economic factors.* States, airlines, and service providers scarcely have money to waste on inadequate or unproven tests. The economic repercussions on airlines or air traffic service providers could be severe if pilots and controllers are denied a licence to operate internationally because of non-compliance with the ICAO language proficiency requirements.

6.3.5 Language testing for licensing purposes needs to be of the highest calibre, and yet, this need occurs within a language testing industry which is, on the whole, self-regulating — there is no independent accrediting agency to which all testing products must apply for accreditation or certification, and no licence is required for a "language tester". This, coupled with both a general public unawareness of the appropriate academic qualifications for language testers and a widespread notion that "anyone who can speak English can teach English", leaves the industry open to investment in poor quality or otherwise inappropriate tests.

6.3.6 For these reasons, the responsibility is on all participants and stakeholders — testers, test developers, and test users — involved in aviation language testing to ensure that the language proficiency tests they select, provide, or develop for the aviation industry are valid, reliable, effective, and appropriate. Test developers, administrators, and providers, in particular, are accountable to the stakeholders: to the pilots and controllers taking their tests; to the airlines and air navigation service providers contracting for the testing, and to the passengers relying on the individual language skills of the airline pilots and air traffic controllers.

6.4 THE SOLUTION: ETHICS AND A CODE OF PRACTICE

6.4.1 Because of the high-stakes nature of language testing within the aviation industry, it is particularly critical that developers and providers of language tests to the aviation industry maintain high quality by conscientious adherence to good language testing principles and practices. The International Language Testing Association (ILTA) is one non-commercial, non-profit organization of language testing professionals dedicated to the improvement of language testing throughout the world. In 2000, ILTA membership adopted the ILTA Code of Ethics for language testers (see Appendix D). Test users and developers can refer to the ILTA Code of Ethics as guidance to ensure that their test development and testing practices maintain high standards.

6.4.2 In addition to a code of ethics guiding test developers and end-users, there is also a need for a code of ethical practice. Yet it has proven somewhat difficult to develop a universally applicable code of practice, and there are indications that this code is best developed in recognition of local cultural or industry practice. One local code of ethics, from the Japan Association of Language Testers, is provided as a sample in Appendix D.

6.5 BEST PRACTICE FOR LANGUAGE TESTING IN AVIATION

Test development

6.5.1 Best practice in language test development can be said to occur when representatives from all stakeholders participate in the process: pilots, controllers, administrators, operational trainers and aviation

language trainers, guided by and working with applied linguists with a specialist background in language test development. Following best practices, the input of qualified linguists is particularly important in the development of a high-stakes test.

6.5.2 Language testing, like language teaching, has benefited from the findings of language researchers and theorists who bring their expertise in applied linguistics to bear on the field of language testing and test development; a list of language testing resources appears in Appendix E. Tests prepared without the expert input of professional test developers can be adequate for diagnostic purposes, e.g. in order to place someone within a training programme or to judge progress, but the need for reliability and validity in the aviation licensing context is so high, with careers and possibly lives at stake, that authorities and administrators should turn to language test development professionals in order to ensure that the tests used or developed for compliance with ICAO language proficiency standards will provide reliable and valid results.

6.5.3 Organizations can ensure the development or selection of appropriate, valid, and reliable tests by relying on the input and recommendations of personnel with, at a minimum, the more rigorous of the background qualifications in English as a Second Language or Applied Linguistics, as detailed in Chapter 4, for the development of language tests. Additionally, organizations will wisely want to select language test developers with additional expertise in language testing: solid experience in language testing and/or an advanced graduate degree in the field. While there are no licence requirements for language test development professionals, a well-qualified language test developer, in addition to holding an advanced university degree (master's or doctoral degree) in one of the language teaching fields (English as a Second Language; Teaching English as a Second Language; Foreign Language Education; Applied Linguistics; or Second Language Acquisition), will also be able to demonstrate some or all of the following qualifications: evidence of professional involvement in the field; documented involvement in research in language testing or previous experience in language testing, and a demonstrable knowledge of both historical and recent developments in language testing research. Other participants in the testing process, test administrators or raters, for example, need not adhere to this stringent set of qualifications for the developers of a high-stakes licensing test.

Subsequent important test development steps

6.5.4 Other essential elements of the test development process, with input from all stakeholders, include writing test specifications; deciding test method and content; developing test items; trialling test items; analysing the results; revising test items; re-trialling the test and test items; validating the test; establishing a rating procedure; establishing a rater training process and a quality control process, and establishing record-keeping administrative functions.

Testers and raters

6.5.5 There is evidence that laypersons or inexpert raters (that is, people with no academic training or qualifications in language teaching or testing) can make adequate judgements about language proficiency, particularly in a "pass" or "no pass" sense. The participation of operational experts, pilots and controllers or trainers in the rating process can add operational integrity to the process, as well as provide technical accuracy. However, candidates who do not "pass" a high-stakes test will want, and will deserve, accurate information about how their performance fell short of the target performance and in what areas they should focus their efforts to improve performance. Because language testing for licensing requirements will impact the professional careers of the candidates, test raters should be able to identify deficiencies in performance and guide candidates towards language learning activities that will improve their language proficiency and,

hence, language test performance. This is the sort of information that qualified language teachers and testers can provide to candidates. Best practice in language proficiency assessment calls for at least two trained and calibrated raters, at least one of whom is a language teacher.

6.6 TESTING SERVICES

6.6.1 Although it is common to speak about the need for "an English test", it is not an entirely accurate conceptual framework in which to discuss language testing needs; it is more accurate to address the need for "testing services". A single test cannot meet the requirement to assess the language skills of the many pilots and controllers, even within a single administration or organization, who must comply with ICAO language proficiency requirements. A testing service, either in-house or outsourced, that can continually provide new test items and/or a large number of raters and administrative services is required.

6.6.2 A second important point which bears emphasizing is that any test will contain a measure of error — no single test can ever provide a perfectly accurate representation of a person's language abilities. Therefore, the best testing practice will be, whenever possible, to use multiple measures or assessments of an individual's language proficiency, i.e. considering scores on a standardized test along with other evidence of language proficiency: for example, instructor assessments, classroom performance, and on-the-job evaluation. Additional factors that can contribute to a fair assessment include documented time in English educational or work environments and interviews.

Appropriate aviation language testing

6.6.3 Regarding testing methodology, there are critical characteristics of an appropriate testing system in the context of aviation language testing. The test must:

a) be a proficiency test of speaking and listening;

b) be based on the ICAO Rating Scale and holistic descriptors;

c) test speaking and listening proficiency in a context appropriate to aviation; and

d) test language use in a broader context than in the use of ICAO phraseologies alone.

6.6.4 Perhaps the most significant contribution of language acquisition and language testing research of recent decades is in the development of theoretical approaches to the understanding of language proficiency upon which testing regimes may be developed. While there is more than one theory addressing the nature of language and of language acquisition, and there is no certainty that any single theory is correct, there are some general principles upon which language tests may be constructed. That test developers may rely on a theory of language as a foundation to test development is an improvement over earlier language testing methodologies which relied solely on intuition or on the historical tradition of teaching and testing Latin grammar. Language research more recently, for example, has centred on the communicative aspects of language use rather than on knowledge of specific grammatical or lexical features, in the attempt to characterize what language is. The interest in communicative approaches to language teaching has led to dramatic revision in language testing practices, with the introduction of testing methods designed to assess language skills *directly*.

6.6.5 Whereas recent research has led to the development of communicative language teaching approaches, many traditional language tests were indirect. Typically in traditional tests, discrete grammar

points were tested, usually through multiple choice questions in a series of unrelated sentences, through test items requiring the candidate to identify an error in a series of unrelated sentences, or through written translation exercises. Such tests are sometimes characterized as being “objective”, in so much as they attempt to assign a number score to an individual’s language proficiency. If, however, we investigate the test development process, it is easy to question the supposed objectivity of such multiple choice-type tests by examining how it is that the particular items and questions on that test were selected from the infinite number of potential items available. Who decides which 100 or so items will best characterize language proficiency and how is that decision taken? Indirect tests do not test language skills *directly*, but instead test discrete features of the language thought to underlie language skills, that is, knowledge *about* language.

6.6.6 Communicative or proficiency tests, on the other hand, are intended to evaluate how an individual is able to actually use language, and they refer to a *scale* of proficiency rather than a number score. In a proficiency test, a panel of trained raters assigns the test-taker to a level on a scale of level descriptors. The more directly test performance is related to target performance, the more a test can be considered a *proficiency* test. For example, test administrators interested in an individual’s speaking skills would arrange for an assessment of that individual’s performance on a speaking task. Speaking skills are *directly* assessed during an interview or conversation or role play or are based on a recorded sample of actual speech. The focus in a proficiency test is on appropriateness and success of communication rather than grammatical accuracy. Grammatical accuracy might be considered only so far as it impedes communication, for example, but evaluating an individual’s grammatical knowledge would not be the test objective.

6.6.7 Proficiency tests are administered *directly*, through face-to-face contact between tester and test-taker, or *semi-directly*, through recorded speaking prompts and recorded responses.

6.7 TESTING ORAL PROFICIENCY AND THE ICAO LANGUAGE PROFICIENCY RATING SCALE

6.7.1 Are direct assessments of language proficiency subjective? A few comments about the use of rating scales and the notions of “objectivity” and “subjectivity” are warranted. In the academic literature on language testing, there are a number of terms associated with practices of language proficiency assessment: testing, measuring, assessing, evaluating, and diagnosing. A term less commonly used in discussions of language testing methodology is “judging”. In this section, we will consider the role of good, experienced, wise and guided judgement in language testing.

6.7.2 Language proficiency testing has its origins in the teaching and testing of Latin grammar; common testing exercises included grammar translation exercises, vocabulary “fill-in-the-blank”, and verb transformation exercises. The modern development of language testing is closely associated with the rise of interest in psychometric measurement, with an emphasis on precise measurement. In the attempt to obtain objective measurements of language ability, the focus of the field of psychometrics-testing techniques required countable test items. As a result, language tests developed from the psychometric tradition tended to focus on knowledge about language rather than actual language performance. Interested readers may refer to Bernard Spolksky’s *Measured Words* for a history of language testing.

6.7.3 One result of such testing techniques was that diplomats in the United States diplomatic services who had scored well on traditional language tests were not able to effectively use the language in the field. The apparently objective language tests in use were not able to accurately predict the ability of the test-taker to actually use the language in practice. These concerns spurred a search for tests that would more accurately reflect an individual’s actual ability to perform. The Oral Proficiency Interview technique, with its accompanying and, in many ways, ground-breaking rating scale, was developed by a consortium of

interests. Since then, language proficiency rating scales have been much used in the direct assessment of speaking proficiency, both through oral interview techniques and through semi-direct test samples.

6.7.4 The use of a rating scale requires that certain conditions be met. Firstly, a community of users must agree upon a set of criteria upon which "admission" to the community will be based. The rating scale should reflect those criteria, and the community must agree to the use of the rating scale. Secondly, a body of well-informed and experienced raters should be formed. The experience and the background of the raters must be such that they inspire trust and can gain the confidence of both the community and the candidates who wish to join the community. The raters must reflect the values of the community and understand the criteria and the context in which the criteria occur. They must also agree upon standardized procedures for the implementation of the criteria. These experienced and trained raters commit to best practice, as outlined in codes of ethics and good practice. Both the standardized procedures and compliance with codes of ethics and practice require evidence that every practical and reasonable measure has been taken to ensure test effectiveness and fairness (reliability and validity). After these conditions are met, then the rating scale is used to make informed judgements about candidates.

Direct and semi-direct testing procedures

6.7.5 Direct and semi-direct tests of language proficiency differ in their format, primarily in the elicitation of tasks. Despite their different attributes, both live and recorded proficiency testing procedures share a common purpose: the direct assessment of an individual's speaking and/or listening abilities. The primary difference between direct and semi-direct testing techniques lies in how speech samples are elicited.

Direct testing procedures

6.7.6 In direct testing procedures, the candidate interacts either with a tester directly or with other candidates while being observed by a tester. Candidates are asked to perform language tasks based on some set of elicitation prompts. Candidates may be asked to engage in a conversation-like interview with a tester, or they may be asked to perform in a role play, either with a tester or with another test candidate. The performance is either observed and assessed in real time, or it may be recorded for later evaluation.

6.7.7 One benefit of direct testing is that the test tasks can be made more natural or more communicative, as the candidates interact either with one another or with an interlocutor. Direct testing tends to be more time- and human resource-intensive than semi-direct testing. On the other hand, an advantage of direct testing is that, because each test is a unique interaction between the tester and the candidate, there is an infinite supply of test prompts available. There is also less likelihood of obtaining rehearsed speech samples, which may not be indicative of a candidate's true proficiency level. Even with numerous test forms, recorded, semi-direct tests can quickly become compromised.

Semi-direct testing procedures

6.7.8 In semi-direct testing procedures, speech samples are elicited based on pre-recorded (and thereby standardized) prompts; this is a significant benefit in that every test-taker receives the same prompts, ensuring, perhaps, a greater degree of fairness. Another advantage is that the test can be administered in an audio or computer laboratory so that a larger number of test candidates can be tested at the same time, for later assessment. While traditional semi-direct testing procedures have been tape-recorded, the use of computer technology for semi-direct testing opens new possibilities for role play, simulation, and human interaction.

Proficiency tests

6.7.9 In both testing formats, the speech sample elicited may be recorded for later rating, although in direct testing procedures, the speech sample is most often evaluated "in real time". In fact, either audio or video recording of the test performance is strongly recommended for verification and record-keeping purposes. See Table 6-1 for a comparison between direct and semi-direct testing.

6.7.10 Important to both methods of testing is that test candidates are asked to use language in one situation as evidence of their ability to perform in other, natural language settings. Such tests, both direct and semi-direct, elicit speech samples which may be judged for proficiency in speaking and listening. Despite their different attributes, both direct and semi-direct proficiency-testing procedures share a common purpose: the direct assessment of an individual's language speaking or listening ability.

> Direct, communicative proficiency tests of speaking and listening abilities are appropriate assessment tools for the aviation industry and will allow organizations to determine whether flight crews and air traffic controllers are able to meet the ICAO language proficiency Standards.

6.7.11 Reading tests, grammar tests, writing tests, vocabulary tests, or any such "pen and paper only" tests (or their computerized versions) may have a role to play in the overall assessment of an individual's language knowledge or may be useful for placement purposes but cannot be considered to provide evidence of speaking proficiency, according to the ICAO language proficiency requirements. (A listening test may, of course, have a "pen and paper" element, in response to recorded listening prompts.)

Table 6-1. Comparison between direct and semi-direct testing

Possible prompts/format	*Direct*	*Semi-direct*
Human interaction	Yes	No
Answer questions	Yes	Yes
Role-play	Yes	Yes, in limited fashion
Score later	Yes (but usually done "live")	Yes
Test many candidates at a time	No	Yes
Interact with other test candidates	Yes	Not usually
Time to administer	More time	Less time
Standardized prompts (eliminates interviewer/tester differences)	*	Yes
	Infinite variety of prompts because of unique nature of each tester/candidate interaction	New prompts must continually be developed

* The Oral Proficiency Interview in the United States does not use standardized prompts. Interviewers are, however, trained in elicitation techniques, so that some degree of standardization is achieved, although not to the same degree, naturally, as with semi-direct testing prompts. Other tests, such as IELTS, which include a live interview as part of the test, may make use of standardized prompts.

Tests that do not evaluate speaking and/or listening skills directly, either through direct interaction or through an audio- or video-taped exchange, are not appropriate to meet the requirements of the ICAO language proficiency testing guidelines.

Use and misuse of a test

6.7.12 To underscore the importance of selecting appropriate tests, it is helpful to consider the consequences of inappropriate test use. All commercially available tests have been developed for a specific use. It is important for any potential user to inquire about what the original intended use of the test was and then to compare that purpose with the ICAO language requirements to see to what extent they are similar or not. All tests have a "wash-back" effect; that is, an effect on training. Candidates and learners naturally want to engage in activities that will help them "pass" the test. If the test assesses knowledge about language rather than *ability to use* the language, then learners will want to learn about the language rather than engage in learning activities that increase their proficiency.

6.7.13 As an example, the use of (or possible misuse of) one widely available test of English used for university admission decisions should be considered. The TOEFL is one of the most well-known academic English tests available commercially and is a useful tool in the academic context for which it was developed. It was developed as a screen for international applicants to American universities and measures academic listening skills, academic reading skills, and knowledge about grammar. The TOEFL does not yet include a speaking component. Universities in the United States usually require a minimum 173 TOEFL score (or 213 TOEFL score for a computer version) or an equivalent score on a number of other similar standardized tests. Some flight training schools, however, unsure of how to otherwise comply with English language proficiency requirements set by the United States Federal Aviation Administration, have taken their cue for checking English proficiency from American academic practice, requiring international flight applicants to submit TOEFL scores as evidence of English language proficiency. Although those flight schools requiring TOEFL scores are clearly making an effort to ensure English proficiency and FAA compliance in the best way they know how, unfortunately this is a case where "any test at all" is NOT better than "no test". The TOEFL, an effective test of English skills for academic work, is not an appropriate measure of English-speaking proficiency for the specialized environment of aviation communications. No inferences about speaking ability can be made from a TOEFL score, particularly in the context of aeronautical communications. Some students with TOEFL scores higher than 173 may have very limited speaking ability, and some students with TOEFL scores lower than 173 may speak English quite well. Although the TOEFL listening section may have some limited value, no studies have been made to demonstrate that a high score on the academic listening TOEFL section indicates proficient interactive speaking ability, particularly in the context of flight training. The TOEFL was not intended to be, and is not useful as, a screen for applicants into flight training programmes. Indeed, relying on TOEFL scores often causes two problems for flight schools: admitting students to flight programmes who do not have sufficient listening and speaking skills for safe flight or efficient training while disqualifying other students who do have sufficient listening and speaking skills for safe flight training but whose lower than 173 TOEFL scores do not demonstrate this.

6.7.14 This case of the misuse of a well-known test which has been shown to be a reliable and valid instrument in the context for which it is intended, but which has negative consequences when used in a different context, is a good example of the importance of selecting or developing a test appropriate to the testing requirements. Well-known and good existing tests, such as the TOEFL, TOEIC and IELTS, were developed for other language testing contexts and do not specifically relate to the aviation context.

Correlations to other, existing language proficiency rating scales

6.7.15 A number of well-known and widely available English language tests exist, and it is tempting to want to correlate the new ICAO Language Proficiency Rating Scale with results from one or more of these existing tests, so that an ICAO level "means something", another way of asking that the ICAO requirements be moved into an already familiar context. It would certainly be convenient if an ICAO Operational Level 4 could be said to be "equal" to a certain score on any number of existing tests. The usually informal availability of various tables offering correlation between certain tests belies the difficulty of the task, and test companies themselves are usually more cautious about making correlations, as test equivalence is a complex matter.

6.7.16 In the first instance, tests are usually different from one another in what they set out to evaluate. For example, many popular and available tests do not test speaking proficiency, a requirement for any testing designed to meet ICAO requirements. Other tests may include a speaking and/or listening element but were designed to test speaking proficiency in a different context, often in the context of university academics or office/business communications. The ICAO Rating Scale, in particular, was developed with the specific requirements of pilot and air traffic control communication in mind, and an assessment process would want to address these features of the ICAO descriptors.

6.7.17 It is also reasonable that other, more "general-purpose" or "other-purpose" scales may provide information about a "jumping off" point prior to working towards ICAO-specific objectives, particularly in the training context (rather than an end-of-training or pre-licensing test). To that extent, it may be noted that reference was made to three existing language proficiency rating scales in the development of the ICAO scale, all of which have had many years of use in the assessment of the English language proficiency of pilots and air traffic controllers: the pass/fail EUROCONTROL PELA scale; the level 4 in the scale from the École Nationale de l'Aviation Civile (ENAC); and a 2+/2+ on the U.S. Inter-agency Language Roundtable (ILR) scale.

6.8 GENERAL-PURPOSE AND SPECIFIC-PURPOSE LANGUAGE TESTING

6.8.1 Having established the importance of a code of ethics and best practice for testing and having laid the groundwork for identifying or developing appropriate language tests for pilots and controllers, testing administrators (providers or developers) will next need to consider content. The provisions of the ICAO language proficiency requirements that address test content are as follows:

- **Annex 10, Volume II, Chapter 5, 5.1.1.1** refers to the need for both phraseologies and plain language;
- **Annex 1, Appendix,** holistic descriptors 2 b), 2 c), and 2 d) refer in turn to "work-related topics", "work-related contexts", and "routine work situation"; and
- **Annex 1, Attachment,** under Vocabulary and Comprehension, refers to "work-related topics".

6.8.2 The objective of the ICAO language proficiency requirements is to ensure that flight crew and air traffic controllers have sufficient language proficiency in whatever language they use for radiotelephony communications to manage all of the potential communicative needs related to pilot and controller communications, ranging from routine phraseologies, to routine communications not encompassed by phraseologies, to non-routine situations (aircraft lost or low on fuel), to outright emergencies. It is known that

pilots and controllers can memorize phraseologies, and it is known that phraseologies are often not sufficient, and so it is clear that a language test for aviation communications should not be limited to testing knowledge of phraseologies.

6.8.3 The purpose of direct or semi-direct language testing is to elicit a speech sample for assessment in order to make predictions or generalizations about future language use. It follows, then, that a language test for the aviation industry should replicate as far as possible the work-related communicative requirements. In addition, experience shows that professional pilots and air traffic controllers want to be, and even insist on being, tested on the language they need on the job.

6.8.4 General-purpose English testing attempts to evaluate language proficiency regardless of the place or manner in which it was acquired. It is person-oriented and topic-independent. Specific-purpose English language testing seeks to evaluate a test-taker's ability to perform tasks in ways that closely approximate job-related tasks. It is mission-oriented and may be more limited in scope. Proponents of general-purpose English testing hold that language ability is not significantly constrained by context, and that inferences about future language ability in one context can be made from language performance in another context (a conversation or interview, for example).

6.8.5 While we tend to talk in terms of "specific-purpose" testing versus "general-purpose" testing, it is more accurate to posit all tests on a specificity continuum. Challenges to the notion of general-purpose language testing have been made on the grounds that all language testing is conducted in one context or another and that there is little value to the notion of general competence because, it is argued, language competence ever only exists in relation to specific contexts; i.e. all language use occurs in a context and the context impacts test performance. Rather than a strict division between two types of tests, a continuum of specificity for language tests is posited, with all language tests falling somewhere on the continuum from very general to very specific. A specific-purpose test has been defined as one in which test content and methods are derived from an analysis of a specific-purposed target language use situation.

6.8.6 In the unique context of pilot and controller communication, it is evident that both types of proficiency tests — general purpose and aviation-specific — may have a role, with, however, two cautionary notes.

a) Aeronautical radiotelephony communications are based in large part on standardized phraseologies. However, in addition to unexpected emergency or urgency situations, there are many non-routine but not necessarily unusual circumstances that are not covered by phraseologies. An appropriate speaking/listening test designed to assess compliance with the ICAO language proficiency requirements will not be limited to testing knowledge of standardized phraseologies but will assess a broader range of communicative abilities.

b) A speaking or listening test developed for another context may not be appropriate to the context of aviation communications.

6.8.7 The content of a proficiency speaking test, or the degree of aviation specificity, will be determined in part by at what point in the training or career the test is given. Naturally, if the language proficiency of candidates is assessed before they have received aviation training, then a specific-purpose test requiring knowledge of aeronautical radiotelephony communications is not appropriate. There is a need for a number of different tests; for example, a language test appropriate for ab initio pilots or controllers will be different from that required by professional pilots or controllers A useful model may include a test comprised of a mix of both aviation-specific content alongside less aviation-specific content. Such a test would ensure that the training content remains strongly guided by performance objectives. It also gives face validity to the testing process in that it involves ATC professionals as testers alongside the language specialists. The less specific content (or more general content) gives access to a wider sample of student

speech/interaction and allows training to focus on a wider variety of language contexts so as to maintain interest and motivation. In addition, if we assume that all language use occurs in a context and the context impacts test performance, then the context is important. Why should pilots or controllers be tested, say, on their ability to describe a favourite movie, or to order pizza, when what they need to be able to do is to safely negotiate all communicative language functions related to flying and controlling aeroplanes.

6.9 COMPUTER-ASSISTED LANGUAGE TESTING

6.9.1 Computer-aided training (CAT) or, in language training, computer-aided language learning (CALL) creates new possibilities for both training and testing, and there have been some interesting recent developments. First, however, it is useful to distinguish the role that computers can have in the administration of language tests from a potential role computers may have in the assessment of language proficiency. The application of computers in the delivery of tests is far-reaching; computerized tests may, for example, allow for a combination of role play or simulation with easy, practical delivery to a much greater degree than previously possible.

6.9.2 Using computers to rate speech, however, entails a distinct group of considerations. The attractions of using computers to rate speech are obvious: reducing cost and time constraints. The ICAO language proficiency requirements embodied in the holistic descriptors and rating scale were developed with the specific requirements of radiotelephony communications in mind. Each facet of the rating scale is as important as any other, and any test or test procedure or test rating method must take into account each facet of the Rating Scale and each holistic descriptor. It is very difficult, for instance, to establish a degree of authentic interactivity or to evaluate the quality of interactions through computerized rating. It is apparent that computerized voice recognition technology, while having legitimate application in a number of instances, is not yet reliable to the degree necessary in aviation language testing. One EUROCONTROL study on the suitability of computerized voice recognition technology found that the technology was still insufficiently reliable for the safety requirements of aviation communications. There may, however, be a role for computerized ratings at lower levels of language proficiency testing, as screens for training programmes, for instance.

6.9.3 The Oral Proficiency Interview is a general-purpose proficiency test used by many governmental agencies in Australia, Canada, and the United States; and the PELA, developed by EUROCONTROL, is an aviation-specific English language proficiency test designed for student air traffic controllers. An examination of how these two speaking/listening tests are used in aviation is contained in Appendix C.

6.10 SUMMARY

Language testing has a central role to play in aviation safety. The field of language testing is a profession in its own right, with professional associations, standard-bearing organizations, commercial interests, and professional training organizations. It is beyond the scope of this manual to include the full breadth of useful and important information available. A list of useful resources is included in Appendix E for further guidance. However, State aviation authorities, airlines, air navigation service providers and training establishments can ensure that language tests which are developed to meet the need of the aviation industry to fulfil the requirements of ICAO language proficiency Standards are sufficient, appropriate, and fair by adhering to the minimal guidelines established in this manual.

Chapter 7

AVIATION LANGUAGE AND AERONAUTICAL RADIOTELEPHONY COMMUNICATIVE LANGUAGE FUNCTIONS

Key concepts

- There are three distinct roles of language as a factor in aviation accidents and incidents:
  - Use of phraseologies
  - Proficiency in plain language
  - Use of more than one language
- The following information will support curriculum development for aviation language programmes:
  - Aeronautical communicative language functions
  - Inventory of events and domains
  - Priority lexical domains
  - Aviation language tasks

7.1 INTRODUCTION

The objective of this chapter is to provide an introduction to aviation language and to a set of aeronautical communicative language functions, found in Appendix B to this manual. It is meant to be of particular use to language teachers working in the aviation field.

7.2 LANGUAGE AS A FACTOR IN AVIATION INCIDENTS AND ACCIDENTS

The function of language in aviation communication safety

7.2.1 Accident investigators usually uncover a chain of events lining up in an unfortunate order to finally cause an accident, and language simply becomes one link in the chain of events. In some instances, the use (or misuse) of language has contributed directly or indirectly to an accident. At other times, language is a link which exacerbates the problem. The purpose of the ICAO language proficiency requirements is to

ensure that the language proficiency of flight crews and air traffic controllers is sufficient to reduce miscommunications as much as possible and to allow pilots and controllers to recognize and solve potential miscommunications when they do occur. In short, language should be a tool to identify and help solve a potential problem before it becomes a disaster, rather than being one more attention-demanding obstacle. Rather than language playing a contributing role, the object of ICAO language proficiency requirements is for language to play a problem-alleviating or problem-avoiding role.

7.2.2 Language has three distinct roles in accidents and incidents:

a) in the use of phraseologies;

b) in the use of plain language; and

c) in the use of more than one language in the same environment.

Incorrect use of phraseologies

7.2.3 An incorrect use of phraseology has contributed, in some instances, to an accident or incident. The purpose of using phraseologies is to promote clarity and brevity; standardized phraseologies are developed to avoid ambiguity. For phraseologies to have the most significant safety impact, all parties need to use the same, ICAO phraseologies. The importance of disciplined adherence to ICAO phraseologies is elaborated upon in Chapter 3.

Inadequate plain language proficiency

7.2.4 While incorrect application of phraseologies has been determined to be a contributing factor in some accidents, a lack of general proficiency in the language used for radiotelephony communications is more often cited as having played a contributing role. The controller last in contact with the English-only speaking crew which strayed off course and crashed into a mountainside acknowledged to accident investigators that the flight's position reports were incongruent with where he understood their position to be. However, by his own admission, he lacked plain English proficiency to clarify his doubts or to notify the crew that they may have been off course.

7.2.5 The purpose of phraseologies is to provide clear, concise, unambiguous language to communicate messages of a routine nature. While standardized ICAO phraseologies have been developed to cover many circumstances, mainly routine events but also some predictable emergency or non-routine events, it is important to be clear that it was never intended for phraseologies to fully suffice for all pilot and controller communication needs. It is widely acknowledged by operational and linguistic experts that no set of standardized phraseologies can fully describe all possible circumstances and responses.

Role of plain language illustrated

7.2.6 While it is widely recognized that a need for plain language may quickly arise during emergency or unusual situations, the critical role of plain language in more or less routine situations is less recognized outside the relatively small circle of applied linguists who specialize in aviation communications. In fact, in addition to the need for plain language which is readily acknowledged to occur during unusual or emergency situations, plain language is a requirement in many everyday situations. Pilots and controllers frequently need to share information or to negotiate a variety of matters. Consider, as an example, the following exchange:

ATC: Midland Five November Zulu Good morning Radar contact Proceeding into Kerky Vectoring 02.

Pilot: Direct Kerky 02 Midland Five November Zulu Can we keep high speed?

ATC: For the time, yes.

7.2.7 While it is acknowledged that this transcript of actual ATC communication represents imperfect use of available phraseology, it is also true that there is no example of ICAO phraseology for this pilot's request for permission ["Can we keep high speed?"]. As such, this is an example of a situation that can occur which calls on plain language proficiency in order to meet the communicative requirements of the task at hand.

7.2.8 Of course, the most critical need for plain language proficiency arises during urgent or emergency situations, when inadequate language proficiency simply becomes another barrier to the successful conclusion of a flight. One analysis of a pilot and controller dialogue in which a light, general aviation aircraft could not lower its landing gear reveals that fully 60 per cent of the dialogue required "plain language". An examination of the transcripts of the dialogue highlights the important role that plain language proficiency plays in resolving a problem.

ATC: You will let me know about your intentions for the main landing gear.

Pilot: UD Wilco. We'll try to let the gear down again and if it remains up and I'm unable to release the nose gear then we'll land with all three up.

ATC: Roger. So if you wish you may come for a go around and visual check of your landing gear.

Pilot: Okay, Roger.

ATC: UD have you got the field in sight?

Pilot: UD Affirm.

ATC: Roger. You will . . . you will pass over the field and make a low pass over the runway 29 for landing gear check.

7.2.9 These communications further illustrate the large role plain language can play in resolving an unusual or unexpected situation.

7.2.10 On the other hand, as important as plain language proficiency is, it must be equally clear that according to ICAO Standards (Annex 10, Volume II, 5.1.1.1), plain language is an option only when ICAO phraseologies are not available, with a clear emphasis on the requirement to adhere to ICAO phraseologies whenever applicable. In fact, with increased pressure for non-native English users to demonstrate adequate levels of English language proficiency, proficient speakers of English, in awareness of the special challenges faced by non-native English speakers, can accommodate this challenge by re-committing to ICAO phraseologies and disciplined radiotelephony techniques and by developing an awareness of cross-cultural communication difficulties, a matter elaborated upon in Chapter 3.

Use of two languages

7.2.11 The use of two languages in the same environment can lead to a lack of situational awareness for flight crews who do not understand all the languages used for radiotelephony in that airspace. It has

been cited as a contributing factor in several accident reports; however, the establishment of a single-language radiotelephony environment that would rely only on the English language faces several challenges. It would require all users of airspace to have a sufficient knowledge (ICAO Operational Level 4) of the English language. The new ICAO language proficiency requirements will certainly improve levels of language proficiency in aviation, but it is doubtful that the current level of English proficiency among pilots and air traffic controllers worldwide would permit the implementation of such a policy without excluding a large number of currently active pilots. It must also be recognized that there are significant national, cultural, economic, and organizational impediments that make such a move impractical. Because language use is so closely tied to a community's sense of national and cultural identity, language policies always require sensitive management. While the implementation of a single-language radiotelephony environment on a worldwide basis is not realistic in the short and mid-term, a number of non-native English-speaking ICAO Contracting States, free to set policies more stringent than ICAO Standards, have implemented measures that either require or encourage the use of English only, at least in busy international sectors.

7.3 AERONAUTICAL COMMUNICATIVE LANGUAGE FUNCTIONS

7.3.1 To select content to work with is often a difficult task for instructors and curriculum specialists, particularly in a language learning programme. The purpose of this section is to provide guidance to English language curriculum and material developers in the selection of appropriate programme content, with reference to the aeronautical communicative language functions identified by researchers at the École National de l'Aviation Civile in France (see Appendix B).

7.3.2 The goal of many kinds of training programmes is for the student to learn or master a specific subject matter content. In a language training programme, however, the goal is to acquire skill or competency in using a language. The subject matter is the language itself. In some respects, language learning is similar to an athletic training programme in that success depends not so much on memorizing or learning a particular body of knowledge, but rather, on the incremental development of a skill set, based on progressive familiarity with a language. In language training, as in the development of athletic skills, there is no substitute for time and effort. By using a language, one learns the language. Instruction in a language class merely points the way, focussing the learner's attention on some particular aspect of the language, clarifying use and offering opportunities to use the language.

7.3.3 Many traditional English language learning programmes have attracted a variety of students with individual motivations for learning English: some intend to enter academic programmes which require the use of English; others want to learn or improve their English for business purposes, and still others may want to learn English simply for the pleasure of it. In such programmes, the content of the course is simply the vehicle through which learners gain access to opportunities to use and practice the language. Faced with a wide variety of learner backgrounds, interests, and motivations, teachers and material developers often developed language lessons around a variety of high-interest general content material, hoping to appeal to a wide variety of interests.

7.3.4 In specific-purpose language training, on the other hand, an advantage is that learners share a common interest and motivation for learning the language. The fact that people typically learn better when the content is related to their personal or work life can be exploited by instructors and material developers in specific-purpose language programmes. Content relevant to the interests and work requirements of the students can be selected. As an example, consider a typical "English for banking" programme. A goal of the students may be to learn English in order to communicate successfully with customers. In order to help students achieve that goal, the instructor will likely present a variety of banking- and business-related content materials on which class work can focus; some of the classroom exercises will focus on role-playing customer conversation, while other classroom time will be spent wisely on reading or discussing other

banking-related materials. This is important for two reasons. Firstly, language learning happens when learners are presented with a breadth of comprehensible input. A wider variety of related materials offers learners the best opportunity for acquisition of the target language features. Secondly, it is important that learners are provided with a rich variety of input because of the nature of human interactions; it is not possible to forecast every possible utterance that a speaker may encounter. These principles are equally applicable to teaching aviation English, even in the comparatively restricted environment of radiotelephony communications.

7.4 SPECIFIC-PURPOSE LANGUAGE TEACHING

7.4.1 The communicative approach to language teaching involves learning language by being involved in tasks that require its use. One way of organizing a communicative language teaching curriculum is through a focus on the communicative functions of language. Specific professional subject areas have specialized genres, specialized vocabulary, and a possible focus on specific parts of the grammar. To aid training organizations in the development of an appropriate English language training curriculum for pilots and air traffic controllers, a subset of those communicative language functions which are of particular relevance to radiotelephony communications has been identified.

7.4.2 In English language training programmes developed for pilot and air traffic control instructors, programme material developers can capitalize on the common interest and motivation of the learners. Even at very low levels, learners will be motivated by aviation-related materials, both because such materials will be of high interest to the learners and because such material will be seen as relevant to their work.

7.5 AERONAUTICAL LANGUAGE FUNCTIONS, EVENTS, DOMAINS AND TASKS

7.5.1 To assist programme, curriculum, and material developers, several resources to guide training content are provided in Appendix B:

a) *Aeronautical communicative language functions* — a list of language functions commonly used by controllers and pilots in the course of their work;

b) *Inventory of events and domains* — an inventory of events and related domains which characterize the routine and non-routine day-to-day work of controllers and pilots;

c) *List of priority lexical domains* — a list of lexical domains which are most pertinent to the communicative needs of controllers and pilots;

d) *List of language tasks* — a list of common language tasks performed by controllers based on an extensive needs analysis of controller communicative tasks; and

e) *List of common, English four-word clusters* applied to aviation communications.

7.5.2 It should be emphasized again, however, that language learning should not focus exclusively on phraseologies or functions or on any list of possible controller/pilot utterances. Controllers and pilots require a facility with the natural use of a language. The resources found here are meant as aids to curriculum and material development, useful so that language training is more relevant, efficient, and of high interest to the learners; these resources, however, are not meant to constitute the sole content of a programme.

7.5.3 The ICAO-identified communicative language functions in Appendix B specify the communicative tasks in which pilots and controllers frequently engage. The inventory of events and domains suggests usual routine and non-routine topics upon which pilots and controllers will be called to communicate. The list of language tasks is a separately derived list which analyses pilot/controller communications from a slightly different perspective, and the list of priority lexical domains is useful to point the way towards relevant vocabulary. Taken together, this set of information provides more insight into the communicative needs of pilots and controllers.

7.5.4 Whereas the aeronautical communicative language functions, events, domains and tasks specify the communicative tasks in which pilots and controllers frequently engage, the language proficiency requirements, including the holistic descriptors and rating scale, define the proficiency level at which the functions should be performed.

7.6 COMMUNICATIVE FUNCTIONS IN RADIOTELEPHONY COMMUNICATIONS

7.6.1 The communicative function of an utterance corresponds to the speaker's intention in producing a given message; for example, the intention may be to request information, to thank, or to deny approval. Since intentions are inherently linked to the activities that are being undertaken by the speakers, it is evident that those tasks which are peculiar to the jobs of pilots and controllers will give rise to a limited range of communicative functions occurring with a high degree of frequency.

Language functions and language forms

7.6.2 The correct interpretation by a listener of an utterance relies on cues provided by the grammatical structures (verb tense, affirmative or negative form, etc.) and prosodic forms used by the speaker associated with the immediate context of the utterance and the shared knowledge of the participants. In addition, context and situational cues further support interpretation.

7.6.3 It is true to say that there is no one-to-one relationship between these structures or forms and the functions they express. A single function can be expressed by several different grammatical forms, while the same grammatical form can be employed to express a variety of functions.

7.6.4 Nonetheless, in approaching the teaching of grammatical structures by way of the communicative functions that dominate in a given activity, it is possible to focus on the most pertinent structures for a given target use of language, thus saving the learners' time and enabling language trainers to suit their pedagogical activities to the real needs of the learners.

Grouping communicative functions of radiotelephony into broad categories

7.6.5 The dominant functions in a pilot-controller dialogue are presented in the following checklist. The functions have been grouped into four categories corresponding to their role in carrying out ATC and piloting tasks. These categories are:

a) Communicative functions directed towards triggering actions;

b) Communicative functions directed towards sharing information;

c) Communicative functions directed towards managing the pilot-controller relationship; and

d) Communicative functions directed towards managing the dialogue.

7.6.6 The "triggering actions" category is the core function of pilot-controller communications. Supporting the core is the "sharing information" category in the sense that appropriate actions can only be triggered when the pilot and controller are in possession of sufficient shared information about the current situation. The two last categories play a subordinate mediating role with regard to the first two.

7.6.7 The individual functions in each broad category are labelled in the checklist at Appendix B without making reference to specific pilot/controller topics such as clearances to take off, flight plan changes or radar identification. All of these functions and their associated language forms can be usefully learned and practised by referring to general topics in the context of everyday communication.

Specific features of communicative functions

7.6.8 Due to the different roles of the pilot and controller within the overall context of their activity, some functions are typically uttered exclusively by one or the other. These functions are marked (P) or (C) in the checklist in Appendix B. Other functions — marked (P/C) — may be uttered by either speaker in the course of their exchanges. In the training context, this distinction will determine whether given functions need to be learned for comprehension, for production or for both comprehension and production.

7.6.9 Contextual factors may result in certain functions being more or less "marked" for different attitudes, such as politeness or insistence. These markers, which may be lexical ("please") or grammatical ("Could you possibly give me . . .?"), as well as the language structures for the basic functions, need to be learned and practised.

7.6.10 Many communicative functions are paired with one another; e.g. a given function (e.g. request permission) is commonly adjacent to another given function (e.g. give permission) in the context of an exchange. These paired relationships are indicated in the checklist below by displaying related functions in two columns.

Practical uses of the checklist of functions

7.6.11 The primary purpose of the checklist is to enable language course planners and teachers to formulate linguistically appropriate objectives for training and testing. While the checklist is not exhaustive, its coverage has been cross-checked against the published results of a number of linguistic and Human Factors studies of pilot-controller communications.[1]

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1. The studies referred to are:
   — Aviation Topics Speech Act Taxonomy (ATSAT) in Development of a Coding Form for Approach Control/Pilot Voice Communications (DOT/FAA/AM-95/15), O. Prinzo & T. Britton, Office of Aviation Medicine, 1995.
   — Syllabus checklists in Recurrent English Language Training for Air Traffic Controllers, C. Godmet & J. Mell, Direction de la Navigation Aérienne, DNA8 (F), 1997.
   — PELA: Specific Test Objectives in Proficiency Test in English Language for Air Traffic Controllers (HUM.ET1.ST05.3000-GUI-01), A. Enright, Eurocontrol, 1999.
   — Language tasks in Air Traffic Control English Language Project (ATCELP) 1: Identifying Basic English Language Proficiency for International Air Traffic Controllers (FR-EADD-99-62), R. Ramos, R. Chatham, G. Henning, S. Thomas & H. Mogilka, HumRRO/FAA, 1999.

7.6.12 Additionally, the ability for all language users to attribute functional labels to spoken messages is of more than academic importance. The development of this skill is of particular importance in facilitating the processes of preventing and/or resolving misunderstandings and the reporting of previous communications. This ability can be developed by matching the functional labels of the checklist with actually occurring utterances in recordings or transcripts of radiotelephony communications. The sample below illustrates this concept in practice; the excerpt is taken from an authentic dialogue between a controller and pilot and illustrates an analysis of functions and the grammatical forms with which they are associated, in this particular context.

Communicative functions

Actual dialogue	*Functions (and category in which function is found)*	*Form (or structure)*
Bordeaux this is GBEUD		
OK, UD. Loud and clear. UD [1] you are now ten miles from the airfield, [2] north of the airfield. [3] You'll let me know about your intentions for the main landing gear.	1. Giving information (CAT 2) 2. Giving clarification (CAT 3) 3. Asking about intentions (CAT 2.2)	1. Present tense; preposition 2. Elliptical repetition 3. Declarative phrase; mounting intonation
UD, Wilco. [4] We'll try to let the gear down again and [5] if it remains up and I'm unable to release the nose gear then we'll land with all three up.	4. State intentions (CAT 2.2) 5. Predict future action/event (CAT 2.2)	4. Future tense 5. If clause Be unable + infinitive
Roger. So [6] if you wish you may come for a go around and visual check of your landing gear.	Suggest a course of action (CAT 1.3)	6. Conditional proposition Modal + verb

Chapter 8

ADDITIONAL SUPPORT FOR TEACHING AND LEARNING

Key concepts

- Factors which improve language learning:
  - immersion in the target language
  - well-qualified instructors
  - a content-based approach
  - intensive periods of study

8.1 TO THE TEACHER

Ensuring good progress

8.1.1 Although the list of possible influencing factors is potentially limitless, and learner progress highly individual, there are some features of the language learning process that can be pointed to as being very useful. For example, it appears that the length of time a learner spends in a "target-language" immersion environment has a positive effect on language acquisition and pronunciation. Opportunities to interact in the target language is one key to successful language learning. Learners have a need to interact directly and frequently with the target language, particularly with speakers who understand and can reveal how the language works when questioned. The opportunity to negotiate for meaning and to hear corrective feedback in measured doses supports language learning efforts. Similarly, there is a need for a lot of target language materials so that learners have lots of comprehensible input.

8.1.2 Factors that seem to make the process more effective and efficient are immersion in the target language, well-qualified instructors leading the process, a content-based approach, and opportunities to practice and use the language. In addition, intensive periods of study and instruction appear more beneficial than smaller doses of language training over a longer time-frame.

Delivery

8.1.3 Language instruction can take many forms: learners may engage in traditional, classroom-taught courses, face-to-face with an instructor, part-time or full-time, in their home country or in the immersion environment provided by an English-speaking host country; they may participate in Internet English language courses; or they may make use of self-access resources: video or computer-aided language learning programmes. Given the busy schedules of most aviation professionals and the need for

language learning to continue on an ongoing basis, the best language training solution will probably be a combination of multiple course delivery options; learners can improve English language proficiency by participating in a number of language instruction environments. Providing multiple learning options and environments will also play into preferred learner styles.

Method

8.1.4 As there are various theories on the nature of language and of language learning, so too there are many corresponding pedagogical approaches to language teaching and learning. Language research and theory in the last decades have caused a shift in language teaching away from grammar-translation and audio-lingual methods, approaches developed without any theoretic underpinnings. While it is not the intent or function of this manual to recommend any one language teaching approach over another, an effective approach will include a consistent focus on pronunciation with emphasis on intelligibility (being able to pronounce a word clearly enough to be understood), communicability (being able to use the targeted English speech features, so one's speech can be assimilated and responded to quickly and correctly), self-monitoring and self-correction.

8.1.5 Activities should include the following focus areas:

a) minimal pairs (applied to language group idiosyncrasies), syllable stress, unstressed syllables and words, thought groups, intonation, numbers, abbreviations and acronyms, and phonetic alphabet;

b) abundant practice with tasks that require trainees to demonstrate the ability to fully participate in conversations about themselves and the world around them, to include describing in concrete terms such as giving instructions and directions; narrating in the past, present, and future; and handling situations with complications (for example, dealing with loss of luggage, misfiled hotel reservations, inoperative products);

c) ample opportunities for trainees to speak in "paragraphs", controlling sentence structure and exhibiting pronunciation intelligible to native speakers not used to dealing with non-natives, including pronunciation practice and emphasis on accent reduction;

d) abundant trainee practice in comprehending everyday English speech with only occasional slowing down, repetition, and rephrasing, such as conversation with native speakers; watching English language broadcasts and reporting on them; and listening to English language radio programmes (including short wave);

e) increasing opportunities for trainees to respond immediately and without hesitation to oral questions; to practice speaking while collaterally tasked; and to improve comprehension under adverse conditions (such as excessive background noise); and

f) increasing opportunities for trainees, formally and informally, to hypothesize and support their opinions; to deal with unfamiliar topics and situations; to provide abstract explanations; to describe in detail, and to incorporate an increasingly broad range of high-frequency abstract vocabulary and complex sentence structure.

Other elements of a successful language training programme

8.1.6 An observer of an effective language learning programme will not usually see students sitting in rigid rows of desks. Because language learning is about communicating and because communicating

involves interacting with others, the best classrooms will have a flexible design with chairs, tables, or desks that are easily moved. Desks fixed in rigid rows make it more difficult for teachers to create an interactive, communicative environment. Small group work, circle work, and stand-up interactions are important activities of the communicative language classroom.

8.1.7 Other programme needs, depending on the size of the programme, can include a director, an admissions and records officer, a curriculum or academic director, a testing manager, curriculum and material developers. Student advising and tutoring are important parts of a programme design, and instructors or administrators should build time for student-centred activities and tasks into their day. In intensive programmes, after hours extra-curricular activities enrich the learning experience.

8.2 TO THE MATERIAL DEVELOPER — AVIATION-SPECIFIC MATERIALS

One of the particular challenges facing aviation English teachers is the relative lack of commercially available and high-quality, aviation-specific language learning materials. Until more and better quality materials are available, teachers will need to continue to develop their own materials. In the meantime, teachers can:

a) make use of authentic general aviation training texts such as basic instructional material for mechanics or pilots, rewriting the material where necessary to make their own language training texts.

b) subscribe to dedicated aviation magazines and adapt their articles for language use or use them as authoritative source material for their own texts.

c) obtain the catalogue from a good general aviation kit supplier. Sign up for their mailing list. These catalogues reveal hundreds of titles on aviation subjects from “aerodynamics” to the “history of aviation”. Many are designed as informative texts for non-professionals and, as such, provide excellent preparation material for those teachers entering the field of ESP aviation. They can also be edited and graded to provide ideal classroom texts.

d) find the latest video titles on all aspects of aviation from the cockpit training tapes for PPLs to full transatlantic flights on the flight deck of an airliner. These can form the basis of excellent training aids or be used as supplementary material. In addition, many titles are now being converted to run on DVD and contain extra material, such as charts and relevant extracts from aircraft manuals.

e) search for other sources, for example:

Manufacturers’ sales brochures: These are glossy brochures intended for potential purchasers of aircraft. They are very professionally produced and provide very useful, authentic but less challenging descriptions of the aircraft, its performance and its characteristics than the flight manual.

Civil Aviation Authority publications: Many publications, such as *The Airplane* from the FAA, are aimed at novices in the aviation field and as such are very useful for language trainees.

8.3 TO PILOTS AND AIR TRAFFIC CONTROLLERS: STRATEGIES FOR SUCCESSFUL ENGLISH LANGUAGE LEARNING

8.3.1 Pilots and air traffic controllers will need to demonstrate ICAO Operational Level 4 proficiency by 2008. How can you optimize your English language learning process? While there are no magic bullets, no miraculous and speedy learning methods — and you should be suspect of any programme making such claims — there are strategies you can use to maximize the efficiency with which you learn English. Language learning is a complex process, and there is still much we do not understand. However, there are some principles on which linguists generally agree, and these principles can guide you to more effective language learning. Most people can learn a language, and learning some effective strategies will help ensure success.

a) *Understand that learning a language is more a function of time, effort, and opportunity than simply one of age.* Contrary to much common wisdom, some research shows that, outside of pronunciation, given the same circumstances and opportunities for learning, adults have strategies which make them better language learners than children. While research indicates that after adolescence, our ability to acquire a “native-like” accent diminishes, our ability to learn to effectively use a language does not. Most adults can learn a language. While adults will likely not learn to use a foreign language as well as a native speaker will, most adults do not need to speak a foreign language to that degree. Motivation and attitude also play an important role in language learning.

b) *Be realistic.* ICAO Operational Level 4 requirements do not mean that you need to speak English like a native speaker! You don’t need “perfect” grammar to communicate effectively. Your goal is safe and effective radiotelephony communication.

c) *Understand that language learning takes time.* Reputable, reliable programmes never promise quick results because they understand that language learning always involves a commitment of time and mature effort. While you may memorize 45 hours worth of words, phrases and questions (“Where is the bank?”), such learning will not necessarily enable you to understand the answers to your memorized questions. Language learning involves much more than memorizing phrases, and there are too many individual factors influencing language learning to allow for a precise estimate of time required. Nevertheless, progress will certainly be measured in months, not weeks or days (or hours!).

d) *Choose a programme carefully.* There is no one proven best method for learning a language, but it always involves more than memorizing words and phrases. Focussing mainly on grammar is also not a very effective way to learn to speak and communicate in a second language. The misguided notion that “anyone who can speak a language can teach a language” often results in unprepared and ineffective language teaching. Ask about teacher and programme coordinator credentials. In addition to language teaching experience, do the majority of instructors have academic credentials specifically in language teaching? Can those who do not have those credentials demonstrate a commitment to professional development? Are such instructors guided by a master teacher or coordinator who does have appropriate academic credentials?

e) *Focus on what you need.* Since your goal is effective speaking and listening proficiency and because speaking requires human interaction, class time should focus specifically on speaking and listening (using reading and writing as necessary aids to the learning progress). Focus your attention on activities that promote your speaking and listening proficiency. On the other hand, reading at an appropriate level is an excellent way to increase your internal linguistic competence and expand your vocabulary.

f) *Read, read, read.* Reading is an activity that you can do anytime, anywhere, and does not require special technology. Use class time for speaking and listening practice; outside of class, read as often and as much as possible.

g) *Look for aviation-specific programmes.* While not a short cut to language learning, specifically focussed, aviation English training will be more interesting and will help you concentrate your learning in areas appropriate to your work-related needs. What the best programmes can promise are interesting classes with relevant material and engaging instructors.

h) *Take charge of your learning.* The best programmes and the best teachers only supply one half of the necessary equation. Learn a little about language learning. Make English your hobby. Seize every opportunity to practice English. Ask questions. Talk, talk, talk.

i) *Take risks.* Don't be afraid to take risks with the language. Making mistakes is a necessary part of language learning. Be ready to laugh at your mistakes.

8.3.2 Begin now, be consistent and steadfast in your efforts, using a variety of opportunities to interact with English, and believe you will be successful; you will improve your English language proficiency, and you will contribute to improving aviation safety.

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Appendix A

ICAO SARPS

PART I: EXTRACTS FROM ICAO ANNEXES 1, 6, 10 AND 11

ANNEX 1

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1.2.9 Language proficiency

1.2.9.1 Aeroplane and helicopter pilots and those flight navigators who are required to use the radio telephone aboard an aircraft shall demonstrate the ability to speak and understand the language used for radiotelephony communications.

Note.— Pursuant to Article 42 of the Convention on International Civil Aviation*, paragraph 1.2.9.1 does not apply to personnel whose licences are originally issued prior to 5 March 2004 but, in any case, does apply to personnel whose licences remain valid after 5 March 2008.*

1.2.9.2 Air traffic controllers and aeronautical station operators shall demonstrate the ability to speak and understand the language used for radiotelephony communications.

1.2.9.3 **Recommendation.—** *Flight engineers, and glider and free balloon pilots should have the ability to speak and understand the language used for radiotelephony communications.*

1.2.9.4 As of 5 March 2008, aeroplane and helicopter pilots, air traffic controllers and aeronautical station operators shall demonstrate the ability to speak and understand the language used for radiotelephony communications to the level specified in the language proficiency requirements in the Appendix.

1.2.9.5 **Recommendation.—** *Aeroplane and helicopter pilots, flight navigators required to use the radio telephone aboard an aircraft, air traffic controllers and aeronautical station operators should demonstrate the ability to speak and understand the language used for radiotelephony communications to the level specified in the language proficiency requirements in the Appendix.*

1.2.9.6 As of 5 March 2008, the language proficiency of aeroplane and helicopter pilots, air traffic controllers and aeronautical station operators who demonstrate proficiency below the Expert Level (Level 6) shall be formally evaluated at intervals in accordance with an individual's demonstrated proficiency level.

1.2.9.7 **Recommendation.—** *The language proficiency of aeroplane and helicopter pilots, flight navigators required to use the radio telephone aboard an aircraft, air traffic controllers and aeronautical station operators who demonstrate proficiency below the Expert Level (Level 6) should be formally evaluated at intervals in accordance with an individual's demonstrated proficiency level, as follows:*

a) those demonstrating language proficiency at the Operational Level (Level 4) should be evaluated at least once every three years; and

b) those demonstrating language proficiency at the Extended Level (Level 5) should be evaluated at least once every six years.

Note 1.— Formal evaluation is not required for applicants who demonstrate expert language proficiency, e.g. native and very proficient non-native speakers with a dialect or accent intelligible to the international aeronautical community.

Note 2.— The provisions of 1.2.9 refer to Annex 10, Volume II, Chapter 5, whereby the language used for radiotelephony communications may be the language normally used by the station on the ground or English. In practice, therefore, there will be situations whereby flight crew members will only need to speak the language normally used by the station on the ground.

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APPENDIX

REQUIREMENTS FOR PROFICIENCY IN LANGUAGES USED FOR RADIOTELEPHONY COMMUNICATIONS
(Chapter 1, Section 1.2.9, refers)

1. General

Note.— The ICAO language proficiency requirements include the holistic descriptors at Section 2 and the ICAO Operational Level (Level 4) of the ICAO Language Proficiency Rating Scale in the Attachment. The language proficiency requirements are applicable to the use of both phraseologies and plain language.

To meet the language proficiency requirements contained in Chapter 1, Section 1.2.9, an applicant for a licence or a licence holder shall demonstrate, in a manner acceptable to the licensing authority, compliance with the holistic descriptors at Section 2 and with the ICAO Operational Level (Level 4) of the ICAO Language Proficiency Rating Scale in the Attachment.

2. Holistic descriptors

Proficient speakers shall:

a) communicate effectively in voice-only (telephone/radiotelephone) and in face-to-face situations;

b) communicate on common, concrete and work-related topics with accuracy and clarity;

c) use appropriate communicative strategies to exchange messages and to recognize and resolve misunderstandings (e.g. to check, confirm, or clarify information) in a general or work-related context;

d) handle successfully and with relative ease the linguistic challenges presented by a complication or unexpected turn of events that occurs within the context of a routine work situation or communicative task with which they are otherwise familiar; and

e) use a dialect or accent which is intelligible to the aeronautical community.

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ANNEX 6, PART I

CHAPTER 3. GENERAL

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3.1.6 Operators shall ensure that flight crew members demonstrate the ability to speak and understand the language used for aeronautical radiotelephony communications as specified in Annex 1.

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ANNEX 6, PART III

Section II

CHAPTER 1. GENERAL

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1.1.3 Operators shall ensure that flight crew members demonstrate the ability to speak and understand the language used for radiotelephony communications as specified in Annex 1.

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ANNEX 10, VOLUME II

CHAPTER 5. AERONAUTICAL MOBILE SERVICE — VOICE COMMUNICATIONS

5.1 General

Note.— For the purposes of these provisions, the communication procedures applicable to the aeronautical mobile service, as appropriate, also apply to the aeronautical mobile satellite service.

5.1.1 In all communications the highest standard of discipline shall be observed at all times.

5.1.1.1 ICAO standardized phraseology shall be used in all situations for which it has been specified. Only when standardized phraseology cannot serve an intended transmission, plain language shall be used.

Note.— Detailed language proficiency requirements appear in the Appendix to Annex 1.

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5.2 Radiotelephony procedures

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5.2.1.2 *Language to be used*

5.2.1.2.1 The air-ground radiotelephony communications shall be conducted in the language normally used by the station on the ground or in the English language.

Note 1.— The language normally used by the station on the ground may not necessarily be the language of the State in which it is located. A common language may be agreed upon regionally as a requirement for stations on the ground in that region.

Note 2.— The level of language proficiency required for aeronautical radiotelephony communications is specified in the Appendix to Annex 1.

5.2.1.2.2 The English language shall be available, on request from any aircraft station, at all stations on the ground serving designated airports and routes used by international air services.

5.2.1.2.3 The languages available at a given station on the ground shall form part of the Aeronautical Information Publications and other published aeronautical information concerning such facilities.

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5.2.1.4.3 *Pronunciation of numbers*

5.2.1.4.3.1 When the language used for communication is English, numbers shall be transmitted using the following pronunciation:

Numeral or numeral element	*Pronunciation*
0	ZE-RO
1	WUN
2	TOO
3	TREE
4	FOW-er
5	FIFE
6	SIX
7	SEV-en
8	AIT
9	NIN-er
Decimal	DAY-SEE-MAL
Hundred	HUN-dred
Thousand	TOU-SAND

Note.— The syllables printed in capital letters in the above list are to be stressed; for example, the two syllables in ZE-RO are given equal emphasis, whereas the first syllable of FOW-er is given primary emphasis.

5.2.1.5 *Transmitting technique*

5.2.1.5.1 **PANS.—** *Each written message should be read prior to commencement of transmission in order to eliminate unnecessary delays in communications.*

5.2.1.5.2 Transmissions shall be conducted concisely in a normal conversational tone.

Note.— See the language proficiency requirements in the Appendix to Annex 1.

5.2.1.5.3 **PANS.—** *Speech transmitting technique should be such that the highest possible intelligibility is incorporated in each transmission. Fulfilment of this aim requires that air crew and ground personnel should:*

a) enunciate each word clearly and distinctly;

b) maintain an even rate of speech not exceeding 100 words per minute. When a message is transmitted to an aircraft and its contents need to be recorded the speaking rate should be at a slower rate to allow for the writing process. A slight pause preceding and following numerals makes them easier to understand;

c) maintain the speaking volume at a constant level;

d) be familiar with the microphone operating techniques particularly in relation to the maintenance of a constant distance from the microphone if a modulator with a constant level is not used;

e) suspend speech temporarily if it becomes necessary to turn the head away from the microphone.

5.2.1.5.4 **Recommendation.—** *Speech transmitting technique should be adapted to the prevailing communications conditions.*

5.2.1.5.5 **PANS.—** *Messages accepted for transmission should be transmitted in plain language or ICAO phraseologies without altering the sense of the message in any way. Approved ICAO abbreviations contained in the text of the message to be transmitted to aircraft should normally be converted into the unabbreviated words or phrases which these abbreviations represent in the language used, except for those which, owing to frequent and common practice, are generally understood by aeronautical personnel.*

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5.2.1.6.2.1.1 The text shall be as short as practicable to convey the necessary information; full use shall be made of ICAO phraseologies.

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ANNEX 11

CHAPTER 2. GENERAL

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2.27 Language proficiency

2.27.1 An air traffic services provider shall ensure that air traffic controllers speak and understand the language(s) used for radiotelephony communications as specified in Annex 1.

2.27.2 Except when communications between air traffic control units are conducted in a mutually agreed language, the English language shall be used for such communications.

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PANS-ATM

CHAPTER 12. PHRASEOLOGIES

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12.2 GENERAL

12.2.1 Most phraseologies contained in Section 12.3 of this Chapter show the text of a complete message without call signs. They are not intended to be exhaustive, and when circumstances differ, pilots, ATS personnel and other ground personnel will be expected to use plain language, which should be as clear and concise as possible, to the level specified in the ICAO language proficiency requirements contained in Annex 1 — *Personnel Licensing*, in order to avoid possible confusion by those persons using a language other than one of their national languages.

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PART II: ICAO LANGUAGE PROFICIENCY RATING SCALE

(found in the Attachment to Annex 1)

1.1 Expert, Extended and Operational Levels

LEVEL	*PRONUNCIATION* *Assumes a dialect and/or accent intelligible to the aeronautical community.*	*STRUCTURE* *Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task.*	*VOCABULARY*	*FLUENCY*	*COMPREHENSION*	*INTERACTIONS*
Expert 6	Pronunciation, stress, rhythm, and intonation, though possibly influenced by the first language or regional variation, almost never interfere with ease of understanding.	Both basic and complex grammatical structures and sentence patterns are consistently well controlled.	Vocabulary range and accuracy are sufficient to communicate effectively on a wide variety of familiar and unfamiliar topics. Vocabulary is idiomatic, nuanced, and sensitive to register.	Able to speak at length with a natural, effortless flow. Varies speech flow for stylistic effect, e.g. to emphasize a point. Uses appropriate discourse markers and connectors spontaneously.	Comprehension is consistently accurate in nearly all contexts and includes comprehension of linguistic and cultural subtleties.	Interacts with ease in nearly all situations. Is sensitive to verbal and non-verbal cues and responds to them appropriately.
Extended 5	Pronunciation, stress, rhythm, and intonation, though influenced by the first language or regional variation, rarely interfere with ease of understanding.	Basic grammatical structures and sentence patterns are consistently well controlled. Complex structures are attempted but with errors which sometimes interfere with meaning.	Vocabulary range and accuracy are sufficient to communicate effectively on common, concrete, and work-related topics. Paraphrases consistently and successfully. Vocabulary is sometimes idiomatic.	Able to speak at length with relative ease on familiar topics but may not vary speech flow as a stylistic device. Can make use of appropriate discourse markers or connectors.	Comprehension is accurate on common, concrete, and work-related topics and mostly accurate when the speaker is confronted with a linguistic or situational complication or an unexpected turn of events. Is able to comprehend a range of speech varieties (dialect and/or accent) or registers.	Responses are immediate, appropriate, and informative. Manages the speaker/listener relationship effectively.
Operational 4	Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation but only sometimes interfere with ease of understanding.	Basic grammatical structures and sentence patterns are used creatively and are usually well controlled. Errors may occur, particularly in unusual or unexpected circumstances, but rarely interfere with meaning.	Vocabulary range and accuracy are usually sufficient to communicate effectively on common, concrete, and work-related topics. Can often paraphrase successfully when lacking vocabulary in unusual or unexpected circumstances.	Produces stretches of language at an appropriate tempo. There may be occasional loss of fluency on transition from rehearsed or formulaic speech to spontaneous interaction, but this does not prevent effective communication. Can make limited use of discourse markers or connectors. Fillers are not distracting.	Comprehension is mostly accurate on common, concrete, and work-related topics when the accent or variety used is sufficiently intelligible for an international community of users. When the speaker is confronted with a linguistic or situational complication or an unexpected turn of events, comprehension may be slower or require clarification strategies.	Responses are usually immediate, appropriate, and informative. Initiates and maintains exchanges even when dealing with an unexpected turn of events. Deals adequately with apparent misunderstandings by checking, confirming, or clarifying.
Levels 1, 2 ad 3 are on subsequent page.						

1.2 Pre-operational, Elementary and Pre-elementary Levels

LEVEL	*PRONUNCIATION Assumes a dialect and/or accent intelligible to the aeronautical community.*	*STRUCTURE Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task.*	*VOCABULARY*	*FLUENCY*	*COMPREHENSION*	*INTERACTIONS*
Levels 4, 5 and 6 are on preceding page.						
Pre-operational 3	Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation and frequently interfere with ease of understanding.	Basic grammatical structures and sentence patterns associated with predictable situations are not always well controlled. Errors frequently interfere with meaning.	Vocabulary range and accuracy are often sufficient to communicate on common, concrete, or work-related topics, but range is limited and the word choice often inappropriate. Is often unable to paraphrase successfully when lacking vocabulary.	Produces stretches of language, but phrasing and pausing are often inappropriate. Hesitations or slowness in language processing may prevent effective communication. Fillers are sometimes distracting.	Comprehension is often accurate on common, concrete, and work-related topics when the accent or variety used is sufficiently intelligible for an international community of users. May fail to understand a linguistic or situational complication or an unexpected turn of events.	Responses are sometimes immediate, appropriate, and informative. Can initiate and maintain exchanges with reasonable ease on familiar topics and in predictable situations. Generally inadequate when dealing with an unexpected turn of events.
Elementary 2	Pronunciation, stress, rhythm, and intonation are heavily influenced by the first language or regional variation and usually interfere with ease of understanding.	Shows only limited control of a few simple memorized grammatical structures and sentence patterns.	Limited vocabulary range consisting only of isolated words and memorized phrases.	Can produce very short, isolated, memorized utterances with frequent pausing and a distracting use of fillers to search for expressions and to articulate less familiar words.	Comprehension is limited to isolated, memorized phrases when they are carefully and slowly articulated.	Response time is slow and often inappropriate. Interaction is limited to simple routine exchanges.
Pre-elementary 1	Performs at a level below the Elementary level.	Performs at a level below the Elementary level.	Performs at a level below the Elementary level.	Performs at a level below the Elementary level.	Performs at a level below the Elementary level.	Performs at a level below the Elementary level.

Note.— The Operational Level (Level 4) is the minimum required proficiency level for radiotelephony communication. Levels 1 through 3 describe Pre-elementary, Elementary, and Pre-operational levels of language proficiency, respectively, all of which describe a level of proficiency below the ICAO language proficiency requirement. Levels 5 and 6 describe Extended and Expert levels, at levels of proficiency more advanced than the minimum required Standard. As a whole, the scale will serve as benchmarks for training and testing, and in assisting candidates to attain the ICAO Operational Level (Level 4).

PART III: EXPLANATION OF RATING SCALE

PRONUNCIATION

The six levels of pronunciation descriptors are applicable at all levels to native and non-native speakers; that is, "native" English speakers may demonstrate Elementary Level 2 proficiency if their regional dialect is so localized that it is not readily understood by those outside of that particular region. On the other hand, speakers whose speech patterns clearly identify them as "non-native" speakers (having a so-called "heavy" accent) may demonstrate Expert Level 6 proficiency, as long as they meet the criteria of almost always being *easy* to understand by proficient listeners.

Level	Descriptors	Additional information
Expert **6**	Pronunciation, stress, rhythm, and intonation, though **possibly influenced** by the first language or regional variation, **almost never** interfere with ease of understanding.	An Expert Level 6 speaker may be a speaker of English as a first language with a widely understood dialect or may be a very proficient second-language speaker, again with a widely used or understood accent and/or dialect. The speakers' accent or dialect may or may not identify them as second-language users, but the pronunciation patterns of Expert speakers or any difficulties, "mistakes", almost never interfere with the ease with which they are understood. Always clear and understandable.
Extended **5**	Pronunciation, stress, rhythm, and intonation, though **influenced** by the first language or regional variation, **rarely interfere** with ease of understanding.	Extended Level 5 speakers demonstrate a marked accent, or localized regional variety of English, but one which rarely interferes with how easily understood their speech is. Always clear and understandable, although, only occasionally, a proficient listener may have to pay close attention.
Operational **4**	**. . . only sometimes interfere . . .**	An Operational Level 4 speaker also demonstrates a marked accent, or localized regional variety of English. Occasionally, a proficient listener may have to pay close attention to understand or may have to clarify something from time to time.

Operational Level 4 is certainly not a "perfect" level of proficiency; it is the minimum level of proficiency determined to be "safe" for air traffic control communications. While it is not an Expert, fully proficient level, it is important to keep in mind that pronunciation, or form, plays the critical role in aiding comprehension between two non-native speakers of English.

STRUCTURE

Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task. Users may refer to the communicative aeronautical language functions and to the list of controller communicative tasks in Chapter 7 of this manual for guidance.

Language teaching specialists generally categorize structural (or grammatical) errors into two classes: "global" and "local". Global errors are those which interfere with meaning; local errors are those which do not interfere with meaning.

Level	Descriptors	Additional information
Expert **6**	Both basic and complex grammatical structures and sentence patterns are consistently well controlled.	Expert Level 6 speakers do not demonstrate consistent global structural or grammatical errors but may exhibit fossilized local errors.
Extended **5**	Basic grammatical structures and sentence patterns are consistently well controlled. Complex structures are attempted but with errors which sometimes interferes with meaning.	Extended Level 5 speakers demonstrate less control of complex grammatical structures than do Expert Level 6 speakers and may commit global errors from time to time when using complex structures.
Operational **4**	Basic grammatical structures and sentence patterns are used creatively and are usually well controlled. Errors may occur, particularly in unusual or unexpected circumstances, but rarely interfere with meaning.	Operational Level 4 speakers have good command of basic grammatical structures. They do not merely have a memorized set of words on which they rely but have sufficient command of basic grammar to create new meaning as appropriate. They demonstrate errors, particularly local errors, but infrequent global errors.

VOCABULARY

A partial list of vocabulary domains related to aviation communications is found in Chapter 7 of this manual.

While memorizing phraseologies is neither an acceptable means of demonstrating language proficiency nor an effective or recommended language learning strategy, it is undeniable that *context* is a relevant factor in language proficiency. Therefore, learning or testing that focusses on, or is designed to elicit vocabulary related to, aeronautical radiotelephony communications is acceptable. An appropriate methodology is to train and test in a broad *aviation-related* context, in order to ensure that proficiency will be fully adequate in the usually narrow constraints of aeronautical radiotelephony communications.

Level	Descriptors	Additional information
Expert **6**	Vocabulary range and accuracy are sufficient to communicate effectively on a wide variety of familiar and unfamiliar topics. Vocabulary is idiomatic, nuanced, and sensitive to register.	Register refers to those aspects of style, tone, and lexical choice which correspond to context and status. One of the more difficult foreign language learning tasks seems to be acquiring a cultural sensitivity to register. Another marker of strong proficiency seems to be the acquisition of, and facility with, idiomatic expressions and the ability to communicate nuanced ideas.

Level	Descriptors	Additional information
Extended **5**	Vocabulary range and accuracy are sufficient to communicate effectively on common, concrete, and work-related topics. Paraphrases consistently and successfully. Vocabulary is sometimes idiomatic.	Extended Level 5 speakers may not be sensitive to register, with a lexical range which may not be sufficient to communicate effectively in as broad a range of topics as an Expert Level 6 speaker, but a speaker with Extended proficiency will have no trouble paraphrasing whenever necessary.
Operational **4**	Vocabulary range and accuracy are usually sufficient to communicate effectively on common, concrete, and work-related topics. Can often paraphrase successfully when lacking vocabulary in unusual or unexpected circumstances.	An Operational Level 4 speaker will likely not have a well-developed sensitivity to register. Vocabulary is not expected to be idiomatic. A speaker with Operational proficiency will usually be able to manage communication on work-related topics, but may sometimes need clarification. When faced with a communication breakdown, an Operational Level 4 speaker can paraphrase and "negotiate meaning" so that the message is understood.

FLUENCY

Fluency is a difficult concept to define but most speakers have an intuitive sense of what it is. As radiotelephony communications take place in a busy environment, the communications of air traffic controllers and pilots must not only be clear, concise, and unambiguous, but responses must be delivered efficiently and a rapid response time is expected. Therefore, for our purposes, "fluency" is intended to refer to the naturalness of speech production, the degree to which comprehension is impeded by any unnatural or unusual hesitancy, distracting starts and stops, distracting fillers (em . . . huh . . . er . . .) or inappropriate silence.

Level	Descriptors
Expert **6**	Able to speak at length with a natural, effortless flow. Varies speech flow for stylistic effect, e.g. to emphasize a point. Uses appropriate discourse markers and connectors spontaneously.
Extended **5**	Able to speak at length with relative ease on familiar topics but may not vary speech flow as a stylistic devise. Can make use of appropriate discourse markers or connectors.
Operational **4**	Produces stretches of language at an appropriate tempo. There may be occasional loss of fluency on transition from rehearsed or formulaic speech to spontaneous interaction, but this does not prevent effective communication. Can make limited use of discourse markers or connectors. Fillers are not distracting.

COMPREHENSION

In air traffic control communications, pilots rely on the clear and accurate information provided to them by controllers for safety. It is not sufficient for air traffic controllers to be able to handle *most* pilot communications; they must be ready for the unexpected. Similarly, pilots must be able to understand air traffic controller instructions, especially when these differ from what a pilot expects to hear. It is during complications in aviation that communications become most crucial, with a greater reliance upon plain language.

Level	Descriptors	Additional information
Expert **6**	Comprehension is consistently accurate in nearly all contexts and includes comprehension of linguistic and cultural subtleties.	
Extended **5**	Comprehension is accurate on common, concrete, and work-related topics and mostly accurate when the speaker is confronted with a linguistic or situational complication or an unexpected turn of events. Is able to comprehend a range of speech varieties (dialect and/or accent) or registers.	
Operational **4**	Comprehension is mostly accurate on common, concrete, and work-related topics when the accent or variety used is sufficiently intelligible for an international community of users. When the speaker is confronted with a linguistic or situational complication or an unexpected turn of events, comprehension may be slower or require clarification strategies.	As with all Operational Level 4 descriptors, comprehension is not expected to be perfectly accurate in all instances. However, the pilot or air traffic controller will need to have strategies available which allow him or her to ultimately comprehend the unexpected or unusual communication. Unmarked or complex textual relations are occasionally misunderstood or missed. The descriptors of Operational Level 4 under “Interactions” clarifies the need for clarification strategies. Failure to understand a clearly communicated, unexpected communication, even after seeking clarification, should result in the assignment of a lower proficiency level assessment.

INTERACTIONS

Pilots and controllers should be aware that inappropriate silence may indicate a failure to understand.

Level	Descriptors	Additional information
Expert **6**	Interacts with ease in nearly all situations. Is sensitive to verbal and non-verbal cues, and responds to them appropriately.	
Extended **5**	Responses are immediate, appropriate, and informative. Manages the speaker/listener relationship effectively.	
Operational **4**	Responses are usually immediate, appropriate, and informative. Initiates and maintains exchanges even when dealing with an unexpected turn of events. Deals adequately with apparent misunderstandings by checking, confirming or clarifying.	A pilot or air traffic controller who does not understand an unexpected communication must be able to communicate that fact. It is much safer to query a communication, to clarify, or even to simply acknowledge that one does not under-stand rather than allow silence to mistakenly represent comprehension. At the Operational Level 4, it is acceptable that comprehension is not perfect 100 per cent of the time when dealing with unexpected situations, but Level 4 speakers need to be skilled at checking, seeking confirmation, or clarifying a situation or communication.

Appendix B

AVIATION LANGUAGE

PART I: COMMUNICATIVE LANGUAGE FUNCTIONS, EVENTS, DOMAINS AND TASKS ASSOCIATED WITH AVIATION

The communicative language functions, events, domains and tasks compiled here are based on research by the Direction Générale de l'Aviation Civile of France and École Nationale de l'Aviation Civile in Toulouse, France.

C = Controller
P = Pilot
C/P = Controller or pilot

1. COMMUNICATIVE FUNCTIONS DIRECTED TOWARDS TRIGGERING ACTIONS

1.1 Orders

— Give an order (C)
— Give an amended order (C)
— Give a negative order (C)
— Give alternative orders (C)
— Cancel an order (C)

— Announce compliance with an order (P)
— Announce non-compliance with an order (P)

1.2 Requests and offers to act

— Request action by another C/P

— Agree to act (C/P)
— State reluctance/unwillingness to act (C/P)
— Refuse to act (C/P)

— Offer to act (C/P)

— Accept an offer to act (C/P)
— Refuse an offer to act (C/P)

1.3 Advice (with or without markers for politeness)

— Request advice (P)

— Give advice (C)
— Suggest a course of action (C/P)
— Suggest a solution to a problem (C/P)
— Suggest alternative courses of action (C/P)

1.4 Permission/approval (with or without markers for politeness and directness)

— Request permission/approval (P)

— Give permission/approval (C)
— Deny permission/approval (C)
— Forbid (C)

1.5 Undertakings

— Undertake to give a service (C/P)
— Undertake to assist (C/P)
— Undertake to contact/relay/report (C/P)
— Announce a spontaneous decision to act (C/P)

— Agree to undertaking/decision (C/P)

2. SHARING INFORMATION

2.1 Information concerning present facts

— Request information (C/P)

— Give information (C/P)

— Request a detailed description (C/P)

— Describe a state (C/P)
— Describe a changed state (C/P)
— Describe an unchanged state (C/P)
— Describe an action in progress (C/P)
— Describe a process (C)
— Describe a procedure (C)
— Describe aims/precautions (C/P)
— Describe the source of a problem (C/P)
— Describe a visual impression (C/P)
— Quote rules

— Ask about needs/wishes (C/P)
— Ask about preferences (C)
— Ask about readiness/availability (C/P)
— Request reasons (C/P)
— Request instructions on how to do (P)

— State needs/wishes (C/P)
— State preferences (P)
— Announce readiness/availability (C/P)
— Give reasons (C/P)
— Give instructions on how to do (C)
— Identify (C/P)
— Announce a problem (C/P)

2.2 Information concerning the future

— Announce an expected action/event (C/P)

— Ask about the expected moment/duration of an event (C/P)

— State the expected moment/duration of an action/event (C/P)

— Ask about possible consequences of an action/event (C/P)

— State possible consequences of an action/event (C/P)

— Ask about intentions (C/P)

— Request prediction (C/P)

— State intentions (C/P)

— Predict a future action/event (C/P)
— Warn (C/P)

2.3 Information concerning immediate and/or recent past events

— Announce a completed action/event having an effect on the present (C/P)
— Announce a change (C/P)
— Announce a nearly completed action (C/P)

2.4 Information concerning the past

— Ask about past events (C/P)

— Request an explanation of a past action (C/P)

— Announce a past action/event (C/P)
— Announce an avoided problem/incident (P)
— Give a report (C/P)
— Describe a previous communication (C/P)
— Describe a sequence of past actions/events (C/P)

— Give an explanation of a past action/event (C/P)
— Indicate deductive reasoning (C/P)

2.5 Necessity

— Ask about necessity (C/P)

— State necessity (C/P)
— Announce a compulsory action (C)
— Announce an inevitable action/event (C/P)

2.6 Feasibility/capacity

— Ask about the feasibility/capacity (C/P)

— Announce the feasibility/capacity (C/P)
— Announce the unfeasibility/incapacity (C/P)

3. MANAGEMENT OF THE PILOT-CONTROLLER RELATION

— Greet/take leave (C/P)
— Thank (C/P)

— Respond to greeting/leave-taking (C/P)
— Respond to thanks (C/P)

— Complain (P)
— Express dissatisfaction (C/P)
— Reprimand (C)

— Apologize (C/P)
— Reject complaint/reprimand (C/P)

— Express satisfaction (C/P)

— Express concern/apprehension (P)

— Reassure (C)
— Encourage (C)

4. MANAGEMENT OF THE DIALOGUE

— Name addressee(s) (C/P)
— Self-correct (C/P)
— Paraphrase (C/P)
— Close an exchange

— Request response (C/P)
— Check understanding (C/P)
— Check certainty (C/P)
— Correct a misunderstanding (C/P)

— Read back (C/P)
— Acknowledge (C/P)
— Declare non-understanding (C/P)

— Request repetition (C/P)
— Request confirmation (C/P)

— Request clarification (C/P)
— Give clarification (C/P)

— Give repetition (C/P)
— Give confirmation (C/P)/ Give dis-confirmation (C/P)
— Give clarification (C/P)

— Relay an order (C)
— Relay a request to act (P)
— Relay a request for permission (P)

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PART II: EVENTS AND DOMAINS

The following inventory of events, domains and sub-domains are some that characterize the day-to-day communications of air traffic controllers and pilots. These “events” represent control situations, routine or non-routine, which all controllers must be able to handle. Each event may require familiarity with many lexical domains, to which are associated related words.

1. EVENTS, DOMAINS, AND SUBDOMAINS IN AERODROME CONTROL

Airmiss(es) — Air traffic rules; avoiding action; trajectory/flight path; speed; distance/range; aircraft characteristics; position.

Airshows — Traffic information; activity: acrobatics, formation flights; procedures.

Approach delays — Holding instructions; holding procedures; aerodrome circuit; endurance; diversion/alternate; necessary conditions; CAT III; all-weather landings.

Belly landing — Attempted manoeuvres; status of lights; visual check (low pass); position of landing gear; endurance; fuel remaining; fuel dumping/jettisoning; speed; traffic information; state of runway; aerodrome environment; airport installations; emergency evacuation; emergency slides/escape chutes, etc.; fire hazard/risk; damage; ground services.

Bird risk/hazard — Position; quantity; names/types of birds; bird scaring in progress; damage to aircraft; delays; bird scaring methods; behaviour of birds.

Bomb threat/alert/scare — Disembarking passengers; diversion; baggage identification; fuel dumping/jettisoning; aircraft interior; crew actions/behaviour; ground services; airport installations.

Cargo problems/ dangerous goods — Customs; type of cargo; (perishable) organs for transplant; toxic substances; handling; packaging; veterinary services; police search; sniffer dogs; load badly fixed or damaged; intercepting; impounding.

Fire on board — Ground services; aircraft interior; smoke; asphyxia; smells; oxygen masks; warning lights; firefighting equipment; extinguishers; injuries; burns; medical assistance; fire brigade/firemen; emergency slides/escape chutes; engine shutdown; evacuation.

Ground movement incidents — Activity on the field; fire brigade training exercises and interventions; vehicles on the field; braking action and visibility; traffic information; start-up; towing equipment; engine checks; remote holding pattern; holding point; runway infringement; delays; stuck in the mud; damage caused by vehicles on the ground; no entry disregarded; collisions; vehicle or plane breakdown; damage to beacons; foreign objects (name, description); problems boarding or disembarking passengers; baggage identification; means of disembarking; health services; handicapped/sick passengers; parking position/space.

Health problems — Symptoms; first aid; aircraft interior; type of medical assistance; medical background of passengers; diversion; airport installations; ground services;

	sickness; discomfort; wounds; epidemics; medical equipment; blood (group, transfusion, etc.); medical advice; the human body; forensic surgeon; quarantine; food poisoning; food; vaccines; medical staff; medicines and artificial limbs.
Incidents on landing	Long/short landing; missed exit; stuck in mud; weather; cargo problems; runway confusion; bird or animal hazard; damage to tires; aircraft breakdown; missed approach.
Industrial action	Ground staff; control/operational staff; effects on trafffic; delays; types of strike; demonstrations; sit-ins.
MET (weather) conditions	ATIS (visibility, clouds, etc.); (thunder) storms, lightning; damage and breakdown; snow clearing; gusts; wind shear and microburst; minima; state of runway; tailwind, crosswind; braking action; runway visual range; temperature inversion; turbulence; natural disasters; runway closed; change of runway.
Missed approach	Go-around; minima; traffic position; endurance; reasons; traffic; procedures; speed.
Parachute jumping/ dropping activity	Position; information on other traffic and activity; duration of drop; drop zone.
Pilot not familiar with airfield	Procedures; airfield installations; ground services.
Pilot's temporary disability	Health problems; aircraft controls and instruments; pilot's actions/behaviour; airfield environment; airport installations.
Problems linked to flight plan	Delays; slots; flight plan updating; computer breakdown; no flight plan; flight plan conformity; flight plan processing; search and rescue; type of flight plan.
Problems linked to passenger's behaviour + unlawful inferference	Violent/threatening behaviour; reasons (drunkenness, etc.); aircraft interior; damage; weapons; actions to overpower; police/fire rescue team assistance requested; demands; ethnic origin; physical description of person(s); political allegiances; ground services; airport installations; injuries/wounds; stowaways.
Re-routing/diversion	Approach charts; procedures; routing; endurance; weather; airport installations; ground services; aircraft breakdowns.
Special flights	ILS calibration; special test flight procedures; banners, balloons, etc.; ultra-lights, gliders; helicopters; aerial photography; highway watch; firefighting aircraft; supervision of power lines; military training procedures; types of military aircraft.
Take-off incidents	Abort; bird/animal hazards; traffic interference; runway incursion; overheating; towing; 180° turn back; runway excursion; cancellation and change of clearance; problems with steering gear, engine power; aircraft breakdown.

VFR flights lost/in difficulty	Aerodrome environment; direction finder; manoeuvres for identification; endurance problems; installations at alternate/diversion field; forced/crash landing; ground services.
VIP flights	Official ceremonies; protocol (greetings, etc.); ferry flight; military escort; diplomatic clearance; country names and nationalities; apron/ramp; terminal; boarding and disembarking of passengers; VIP vehicles; effects on traffic.

2. EVENTS AND DOMAINS LINKED TO EN-ROUTE AIR TRAFFIC CONTROL

Administrative problems	Diplomatic clearances; customs regulations; civil service departments; impounded aircraft.
Aids for VFR flights	Instrument panel; on-board equipment; pilot rating; flight plan; local place name; visual landmarks; positions; directions; endurance; aircraft breakdown; weather problems.
Aircraft breakdowns	Instrument panel; instrument operation; radio beacon; positions/fixes; noises/sounds; smells; smoke; airport installations; ground services; engine performance; speed; relief/high ground; actions to solve problem; weather; fuel dumping/jettisoning; flight profile; structural damage (glass, metal); flight systems; aircraft controls; response to controls; airframe; warning lights; landing gear.
Aircraft proximity + pilot complaints	Conflict situations; traffic load; aircraft characteristics; flight profile; weather conditions; injuries; distance/range; pilot manoeuvres; rules; procedures; avoiding action.
ATC system breakdowns	ATC equipment/systems; radar display; radar performance; radio operation; previous messages; relaying messages; actions to repair; delays/duration; telephone lines.
Bomb scare	Aircraft interior; search methods; fuel dumping/jettisoning; ground services; airport installations; ground movements.
Cargo problems/ dangerous goods	Packaging; substances; toxic substances; animals; smells; cabin equipment; load distribution; loading/unloading.
Change in flight plan	Flight plan.
Collisions	Airframe; structural damage (glass, metal, etc.); response to controls; debris; airport installations; ground services; relief/high ground; weather conditions; aerodynamic behaviour.
Fire on board	Outbreak of fire; control of fire; damage; aircraft interior.
Health problems	Parts of the body; organs; symptoms; sicknesses; injuries/wounds; artificial limbs; medicine/drugs; first aid; medical equipment; medical staff; medical specialists; vaccines; quarantine.

Lack of fuel	Airport facilities/installations; ground services; high ground; positions/ locations; endurance/fuel remaining.
Misunderstandings	Previous messages; types of messages; radio performance.
Passenger behaviour + unlawful interference	Violent threatening behaviour; drugs; firearms; injuries; mental instability; nationalities; political allegiances; demands, threats; ground services; medical assistance; means of calming; means of overpowering; flight deck and cabin personnel.
Request to relay	Names of people; means of relaying.
Special conditions on arrival	State of the traffic on the ground; priority flights; industrial action; accidents; weather conditions on the ground; ground equipment failure; airport installations; ground services; curfew; approach procedures.
Special flights	Type of aircraft; ferrying; diplomatic personnel; country names; nationalities; aeronautical military slang; military exercises; in-flight/mid-air refuelling; pilot manoeuvres; positions/fixes; weather conditions; VFR/IFR procedures; visual flight rules; airport installations; ground services.
Unauthorized manoeuvres	Airspace; rules; previous messages; flight profile; positions/locations; stall levels.
Weather/MET problems	Icing problems; clouds; struck by lightning; turbulence; external parts of aircraft; engine performance; response to controls; instrument performance; alarms; violent movements; relief/high ground; flight profile; injuries; blindness/loss of visibility.

3. OTHER DOMAINS

Activities on the field	Change of runway and pattern; ramp vehicles; snow clearing; sweeping; mowing; harvesting; closure; opening of runway access roads; runway inspection.
Aerodrome/airfield environment	Topography (hill, slope, coastline, forest, etc.); civil engineering (water, tower, bridge, pylon, etc.); high ground/terrain; built-up areas; roads and railway lines; power lines; cardinal points; particular local activities (firing range, etc.); agricultural activities.
Aircraft breakdowns	Aircraft spare parts; systems (oxygen, hydraulic, electrical, de-icing, etc.); flight deck/cockpit; controls; instruments; instrument operation; noises and symptoms of malfunction; transponder problems; loss of radio contact; malfunctions; overheating (brakes, engine, etc.); fuel dumping/jettisoning; landing gear/tires.
Airfield facilities/ installations	ILS, radar, VOR, etc.; lighting systems; reliability of radio aids; direction finder; poor visibility equipment; aprons/tarmac/ramps; runways; taxiways; length and width of runway; parking zone; holding area; terminal; cargo area; bearing strength.

Ground services	Opening hours; availability of services at night; assistance on the ground; safety altitude; passengers/persons on board; unserviceable equipment (stairs, luggage trolleys, etc.); auxiliary power unit; de-icing; refuelling; delay due to de-icing or refuelling; bird scaring; towing; firefighting methods; safety services; medical assistance; baggage handling.
Procedures	Noise abatement; departure; approach; all-weather take-off and landing; go-around; holding procedures; land use; curfew; local residents.

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PART III: PRIORITY LEXICAL DOMAINS

Words can be grouped together according to the “lexical domains” to which they belong (e.g. words referring to “family”, to “cinema”, or to “aircraft”). In fact, the most recent scientific research into human memory seems to indicate that our brains actually store vocabulary in this way. These domains can be very broad (e.g. “topography”) or very narrow (e.g. “capital cities”). The domains we may need to refer to will depend on the contexts and the activities in which we are engaged.

Below is a list of priority lexical domains of “general English” for air traffic control. These are domains which are broadly relevant to air traffic controller and pilot communications.

- Abbreviations, acronyms
- Animals, birds
- Aviation, flight
- Behaviour, activities
- Cargo, merchandise, packaging, materials
- Causes, conditions
- Geography, topographical features, nationalities
- Health, medicine
- Language, spoken communications
- Modality (obligation, probability, possibility)
- Numbers
- Perception, senses
- Problems, errors, accidents, malfunctions
- Rules, enforcement, infringement, protocol
- Space, movement, position, distance, dimension
- Technology
- Time, duration, schedules
- Transport, travel, vehicles
- Weather, climate, natural disasters

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PART IV: LANGUAGE TASKS OF AIR TRAFFIC CONTROLLERS

1. MANAGE AIR TRAFFIC SEQUENCES

- Discuss traffic management action with pilot.
- Query pilot for reason and extent of deviation.
- Issue appropriate control instructions to control deviation.
- Inform others of airspace restrictions imposed or of release of airspace.
- Sequence departures into existing traffic.
- Query others regarding deviation.
- Issue instructions to recover from ground traffic deviation.
- Receive pilot request for take-off.
- Issue appropriate departure information.
- Issue instructions to the pilot to taxi into position and hold.
- Issue amended clearance.
- Issue supplementary information concerning airport operations (e.g. runway conditions, RVR).
- Issue take-off clearance/cancellation.
- Receive pilot request for landing instructions.
- Issue clearance for aircraft to land or clearance for option.
- Receive notice of aircraft executing landing/option.
- Receive initial radio communication from pilot.
- Verify pilot has current arrival information.
- Issue arrival/departure instructions.
- Issue advisory in regard to non-controlled object in airspace or movement area.
- Inform other aircraft of airspace or movement area intrusion by non-controlled object.
- Request response from pilot or operator of non-controlled object.
- Request assistance from other sources to establish contact with non-controlled object.

- Issue instructions restricting aircraft activity in affected airspace or movement area.
- Receive request for temporary use of airspace or movement area.
- Issue go-around.
- Receive notice of missed approach/go around/touch-and-go/stop-and-go.
- Receive acknowledgment of takeoff.
- Receive pilot notification of aborted takeoff.
- Inform other aircraft of airspace status change.

2. CONTROL AIRCRAFT OR VEHICLE GROUND MOVEMENT

- Issue instructions to hold at gate.
- Advise pilot of ground delay.
- Inform pilot of estimated departure clearance time.
- Receive and disseminate cancellation of traffic management restrictions(s).
- Receive pilot request for pushback/powerback instructions.
- Receive pilot request for taxi instructions.
- Issue airport condition information.
- Receive pilot or vehicle operator request for movement in or through movement area.
- Issue instructions to hold short of taxiway/runway.
- Deny ground movement request.
- Issue instructions to divert traffic around closed movement area.

3. ROUTE OR FLIGHT PLAN

- Issue clearance and instructions to pilot.
- Query pilot regarding compliance or conformance with clearance.
- Issue clearance through other stations for relay to pilot.
- Approve or deny clearance request.

- Detect a pilot or aircraft problem (e.g. hypoxia).
- Conduct radio or radar search for overdue aircraft.
- Receive pilot notice of declared emergency and determine assistance needed.
- Receive pilot notice of aircraft having a problem (e.g. overdue, loss of radio contact).
- Forward contingency/emergency/special condition information to other stations.
- Receive flight plan from pilot.
- Receive verbally forwarded flight plan.
- Query others about flight plan or flight plan amendment.
- Receive requested flight plan changes.
- Receive request to cancel IFR.
- Terminate radio communication with aircraft.
- Receive arrival message.
- Issue change of frequency to pilot.
- Issue altimeter setting on initial contact as appropriate.
- Verify aircraft altitude with pilot.
- Inform pilot that radar contact is lost or established.
- Terminate radar service.
- Assign beacon code.
- Request necessary flight plan information from pilot.
- Receive notice of special condition or emergency.
- Inform pilot or vehicle operator of abnormal aircraft or vehicle condition.
- Declare emergency and invoke contingency plan.
- Issue taxi instructions to special condition or emergency aircraft.
- Inform others of special operation.
- Issue change to SSR beacon code assignment.
- Suggest clearance alternatives to pilot.

- Issue instructions to pilot for identification turn or transponder response.
- Perceive presence of special condition or emergency by tone of voice.
- Discuss flight plan/flight plan amendment.
- Inform controller or requester of an inability to comply with flight plan/flight plan amendment request.
- Inform pilot of radar position.
- Receive request to file flight plan from in-flight pilot.
- Receive flight plan request and information from recorded phone message.
- Verify flight plan with pilot.
- Receive request to activate flight plan.
- Query pilot on flight plan closure.
- Advise pilot of clearance status.
- Receive acknowledgment or rejection of clearance from pilot.
- Evaluate and inform pilot of alternate routes on the basis of weather, aeronautical information, pilot preference, and pilot/aircraft limitations.
- Receive pilot requests for airport advisories.
- Relay the requested advisories to the pilot.
- Relay airport status to pilot.
- Relay traffic information/weather conditions to pilot.

4. PERFORM SITUATION MONITORING

- Record airport environmental (e.g. ice on runway) and system equipment status message.
- Request pilot report on NAVAID status.
- Inform pilot of alternate instructions necessary for flight following service.
- Receive/deny request for flight following.
- Receive/request pilot or operator position report.
- Search for and verify aircraft or vehicle location.

- Verify pilot has current ATIS or inform pilot of current ATIS.
- Inform/request pilot to file/re-file flight plan.

5. RESOLVE AIRCRAFT CONFLICT SITUATIONS

- Receive notice of potential or actual conflict.
- Issue traffic advisory or safety alert in regard to aircraft conflict/aircraft proximity.
- Inform pilot or operator when clear of traffic or non-controlled object.
- Issue advisory in regard to restricted airspace proximity.
- Issue advisory or safety alert in regard to route/low altitude situation.
- Request/receive pilot notice of traffic in sight.
- Issue advisory in regard to airspace/movement area violation.
- Issue approval or instructions for ground movement.

6. ASSESS WEATHER IMPACT

- Receive/request weather information from other aircraft.
- Issue weather advisory or update to other aircraft.
- Formulate weather broadcast.
- Record scheduled weather report or advisory in specified format.
- Broadcast scheduled and unscheduled weather report or advisory on prescribed radio frequencies.
- Receive request for pilot briefing.
- Brief pilot on weather data in specified format.
- Inform/verify pilot has received information on hazardous weather.
- Provide pilot with other requested information.
- Notify pilot VFR not recommended if conditions warrant.
- Advise pilot of flight watch capability.

- Advise pilot of ATC delays.
- Inform pilot of frequency and station for filing pilot weather reports.
- Prompt pilot for additional data.
- Maintain clear and uniform speech pattern while broadcasting.

7. RESPOND TO EMERGENCIES AND CONDUCT EMERGENCY PROCEDURES

- Communications.
- Receive pilot request for emergency services.
- Request information from pilot on nature of emergency situation.
- Inform pilot to squawk 7700 if emergency declared.
- Request aircraft contact appropriate ATC unit and inform pilot to return to frequency if unable to contact ATC unit.
- Take appropriate action to resolve emergency situation.
- Request aircraft information to determine altitude, heading, and airspeed of lost aircraft.
- Advise if altitude or heading change is needed and maintain VFR.
- Advise to adjust gyro with magnetic compass.
- Inform pilot of aircraft position.
- Receive pilot request for guidance to airport.
- Issue course instructions and advisories to pilot.
- Advise pilot of airport information.
- Prompt pilot for in-flight information.
- Verify pilot is on a flight plan.
- Advise pilot of minimum flight altitude (MFA).
- Inform pilot of lost communications procedures.

8. MANAGE SECTOR OR POSITION RESOURCES

- Forward deletion of previous substitute routing.
- Forward NAVAID status to others.

- Forward notice of communication status.
- Forward new frequency assignment to pilot or another controller.
- Receive notice of alternate communication path.
- Issue alternate communication for air or ground transmissions.
- Query whether others are receiving pilot's transmissions.
- Receive request to manipulate airport or taxiway lighting system.
- Deny request to manipulate airport lighting system.

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PART V

A. THE TOP 250 FOUR-WORD CLUSTERS IN SPOKEN ENGLISH[1]

An analysis of the top 250 spoken four-word clusters graded by function (quantity, time, location) with examples placed in an aviation training context in most cases. The most frequent phrases in the spoken corpus are at the top of the list.

1. QUANTITY

Phrase	A practical example from an aviation environment
a lot of people	A lot of people first learn to fly in flying clubs.
a lot of the	We will spend a lot of the time practicing turns.
quite a lot of	You will do quite a lot of “touch and go’s” during your basic training.
a bit of a	We had a bit of a problem with the landing gear. John is having a bit of a struggle with his instrument scans.
the rest of the	We’ll spend the rest of the flight practicing navigation techniques.
a lot of money	Flight training costs a lot of money so . . .
a little bit of	We need to gain a little bit of “height” before the next manoeuvre.
an awful lot of	There seem to be an awful lot of clouds to the west.
per cent of the	About 80 per cent of the course consists of ground instruction.
got a lot of	We haven’t got a lot of time before the weather closes in.
a little bit more	You’ll need a little bit more rudder to keep the turns coordinated.
a lot of things	A lot of things can go wrong during a badly planned approach.
think a lot of	a) I think a lot of inexperienced pilots make mistakes through overconfidence. b) I don’t think a lot of these charts. (They are not very good.)
a great deal of	I shall spend a great deal of time talking about airmanship.
a lot of work	You need a lot of work to get your navigation up to standard.
get a lot of	You won’t get a lot of time for briefings during commercial operations.
a certain amount of	We shall spend a certain amount of time familiarizing you with the instrument panel.

1. M. McGrath. Adapted from *The Top 250 Four Word Clusters in Spoken English,* adapted to aviation by Jane Willis, Aston University, United Kingdom, 2003.

Phrase	**A practical example from an aviation environment**
that a lot of	Remember that a lot of incidents occur because pilots fail to take account of adverse weather conditions.
in a lot of	In a lot of cases, weather-related incidents involve experienced pilots.
the whole of the	Today, the whole of the lesson will be devoted to the stall.
know a lot of	I'm sure you know a lot of reasons why it is important to do a pre-flight check.
of a lot of	I can think of a lot of examples where poor airmanship has led to accidents.
some of the things	This is a list of some of the things you must remember to check.
a hundred per cent	This system is not a hundred per cent reliable at low temperatures.
quite a bit of	You'll need quite a bit of power to overcome the extra drag produced by the flap.
to a certain extent	Drag can be reduced to a certain extent by the cleanliness of the aircraft surface.
a couple of days	These weather conditions can sometimes last for a couple of days.
a lot of these	We shall perform a lot of these manoeuvres during our training.
hell of a lot	There is not a hell of a lot you can do if you suffer a total electrical failure.
a lot of	It will mean a lot of extra workload as you locate a suitable diversion.
a lot of that	A lot of that work will fall on the co-pilot.
a lot of other	There are a lot of other causes of fatigue besides lack of sleep.
to a lot of	While your battery lasts, you will have to speak to a lot of air traffic controllers.
the last couple of	The last couple of landings were much better.
some of the other	Some of the other landings this morning were unsatisfactory.
because a lot of	You were rushed on final because a lot of time was taken by the briefing.
got a bit of	On the next approach remember you have got a bit of a crosswind to contend with.
spend a lot of	Don't spend a lot of time trimming the aircraft.
like a lot of	Like a lot of beginners, you spend too much time looking at the instruments.
in the last few	In the last few minutes you have hardly looked out of the window at all.
most of the	Most of the people in your situation make the same mistake.
in some of the	In some of the later manoeuvres you will need to concentrate on the instruments.
done a lot of	By that time, you will have done a lot of visual flying.

Phrase	**A practical example from an aviation environment**
of some of the	Remember that the second pilot will take care of some of the workload.
to some of the	You have a tendency to refer to some of the instruments and to ignore others.
quite a few of	This has caused quite a few of the problems you have been having.
a lot of problems	A lot of problems of handling are due to poor anticipation.
some of the people	Don't worry. Some of the people I have taught were worse than you.
quite a number of	There are quite a number of things to consider when planning an approach.
doing a lot of	We shall be doing a lot of instrument flying in the next few weeks.
just a little bit	You were just a little bit high on the glide path.
the majority of people	The majority of people prefer to stay high for obvious reasons.
a lot of good	a) A lot of good pilots consistently fly a high approach. b) Visual navigation won't do a lot of good if you are in cloud.
see a lot of	We see a lot of students who fail their tests for this reason.
ninety per cent of	Ninety per cent of go-arounds are due to a badly managed approach.
spent a lot of	You spent a lot of time briefing for the approach and so delayed contacting approach control.
that some of the	This meant that some of the approach actions were rushed.
a bit of money	You saved a bit of money on fuel by missing out the last reporting point!
make a lot of	You haven't got time to make a lot of fine adjustments to trim and speed during an instrument departure.
a whole lot of	There are a whole lot of checks to be carried out in a short time.
got a couple of	You have only got a couple of minutes between take-off and the first reporting point.
the rate of	You must learn to control your rate of climb. (rate of climb, rate of descent, rate of turn)
quite a few people	In our airline, you will meet quite a few people who have trained at this school.
the next couple	In the next couple of minutes, you will have to call ATC and give them your ETA for Avignon.
a whole range	There is a whole range of topics in the CRM syllabus.
lot of people in	A lot of people in aviation had never heard of CRM until a few years ago.

Phrase	A practical example from an aviation environment
little bit of a	It came as a little bit of a shock to some of the people who were asked to acquire a CRM qualification.
the number of people	The number of people applying to take these courses is greater than the training schools can cope with.

2. TIME

Phrase	A practical example from an aviation environment
the end of the	By the end of the flight, you will have learned to coordinate turns properly.
end of the day	At the end of the day, every pilot feels tired.
in the middle of	It is not a good idea to change frequencies in the middle of a transmission!
a couple of years	Give it a couple of years and you'll be able to fly a perfect radial.
a lot of time	We have spent a lot of time on your navigation — it's time to move on.
most of the time	We spent most of the time talking to air traffic.
a couple of weeks	You should be ready for your test in a couple of weeks.
clock in the morning	
the beginning of the	At the beginning of the test your concentration wandered slightly.
the middle of the	By the middle of the test you were more in control.
a few years ago	CRM was not part of the aviation syllabus until a few years ago.
a couple of times	A couple of times I didn't understand what the controller was saying.
in the first year	In the first year you will study only ground subjects.
a long time ago	
a couple of days	Give it a couple of days and your response times will be much faster.
to the end of	
towards the end of	It was towards the end of the climb that we noticed the low oil pressure.
a waste of time	That lesson was a complete waste of time. The student made no noticeable progress.
the last few years	There have been many changes to air traffic flow management in the last few years.
the second world war	
quite a long time	It took us quite a long time to climb to our assigned level.

Phrase	A practical example from an aviation environment
couple of years ago	
in a couple of	In a couple of minutes you will need to contact Grenoble approach.
the end of this	Before the end of this turn, check your rate of descent.
end of the year	By the end of the year, I expect to be promoted to captain.
the first world war	
a few weeks ago	We received notification of the upgrade a few weeks ago.
a couple of months	It will take a couple of months for the work on the runway to be completed.
lot of the time	Today's flight was unproductive. We spent a lot of the time in a holding pattern.
couple of weeks ago	I mentioned a couple of weeks ago that I'd be going on holiday.
the end of that	At the end of that lesson he announced that he was going to give up flying!
a couple of hours	It took a couple of hours to repair the radio.
a long time to	It took a long time to de-ice the aircraft this morning.
this point in time	At this point in time we have no plans to extend the runway to accommodate jet aircraft.
in the early days	In the early days there was only a grass runway here.
a number of years	It took a number of years to finally persuade the organization to upgrade.
end of the week	
in the third year	
in the old days	In the old days, pilots normally soloed after a couple of hours.
the start of the	Remember, at the start of the take-off run, your rudder will be ineffective.
a period of time	It takes a period of time for the gyro to spin up to speed.
a couple of minutes	This period can be up to a couple of minutes or possibly more.

3. LOCATION

Phrase	A practical example from an aviation environment
the end of the	I'd like you to taxi right to the end of the runway.
to go to the	I want you to go to the MET office and request the weather.
in the middle of	Our aircraft is parked in the middle of the apron.

Phrase	A practical example from an aviation environment
used to go to	We used to go to Grenoble to practise instrument approaches but not any more.
the other side of	The refuelling point is on the other side of runway 31.
to go back to	We may have to go back to London if we cannot restart the third generator.
the top of the	Stay at least 1 000 feet above the top of the clouds.
the middle of the	Try to keep the aircraft in the middle of the taxiway.
go back to the	I'd like us to go back to the beacon for the next part of the exercise.
the back of the	Life jackets and flares are stowed at the back of the aircraft.
want to go to	I want us to go to Royanne for the next part of our training.
in front of the	Taxi in and park in front of the fuel pumps.
the bottom of the	The glide slope antenna is situated on the bottom (underside) of the aircraft.
other side of the	The tower is on the other side of the runway from the hangars.
the other way round	Remember, power — Attitude — Trim. Not the other way round!
to the end of	
towards the end of	When we get towards the end of the runway, taxi the aircraft left onto the grass.
the end of this	At the end of this taxiway, trim to the right.
going back to the	I'm going back to the operations room to fetch my clipboard.
the front of the	The front of the aircraft should be facing away from the hangar.
the front page of	On the front page of the manual it states quite clearly that this aircraft is non-aerobatic!
to go to a	I'd like us to go to a quiet piece of airspace to practise some general handling.
got to go to	Now we have got to go to the MET office to get the latest weather details.
in the back of	We need some ballast in the back of the aircraft for trim.
to get to the	To get to the terminal building we need to follow taxiways AI and C3.
to go in the	The manuals are supposed to go in the large container at the side of the flight deck.
the end of that	We need to fly to the end of that area of forest before making our turn.
the side of the	Position the aircraft nose-in to the side of the parking area for your run-ups.
side of the road	

Phrase	**A practical example from an aviation environment**
the right-hand side	In a helicopter, the captain sits on the right-hand side of the aircraft.
in the United States	
to go through the	I'd like to go through the procedure once again to make sure that you understand it.
go down to the	Now, perhaps we should go down to the operations room and file our flight plan.
front page of the	
the centre of the	Line the aircraft up with the centreline of the runway.
to go to work	
off the top of	It is especially important to clear any snow and ice off the top of the wing.
wanted to go to	We wanted to go to Glasgow but the airport is below our minima.
the left-hand side	Passengers sitting on the left-hand side of the aircraft will be able to see Mont Blanc.
in the long run	In the long run it doesn't matter whether your initial flight training was on jets.
the edge of the	Keep the aircraft well clear of the edge of the runway and taxiways.
the other end of	At the other end of the aviation spectrum from the 747 there are the microlights.
to go down to	We are planning to go down to Nice for the weekend.

B. THE TOP 250 FOUR-WORD CLUSTERS IN SPOKEN ENGLISH BROKEN DOWN BY FUNCTION

1. IDEATIONAL (general)

Phrase	A practical example from an aviation environment
a member of the	He is not a member of the aeroclub.
a friend of mine	A friend of mine recently failed his medical test.
the name of the	It is important to know the name of the recruitment manager at the airline.
to get a job	It's not easy for a newly qualified pilot to get a job on jets.
to work in the	You have to work in the low end of the market for several years.
a copy of the	Always carry a copy of the aircraft's papers when flying near the border.
a piece of paper	It may only be a piece of paper, but it could avoid a lot of problems if you have to force land in the neighbouring country for any reason.
the quality of the	The quality of the instruction can greatly influence the progress of a weak student.
the size of the	The size of the propeller on an aircraft is usually determined by maximum rpm.
in the process of	When you are in the process of checking the oil level, check also for loose hoses or pipes in the engine compartment.
a cup of tea	
the first thing that	The first thing that you should do in any emergency situation is not panic.
the history of the	The history of the aero engine has, until relatively recently, largely been determined by military requirements.
in charge of the	I'll be in charge of the radio and navigation aids for the first leg of the flight.
in a position to	When I am in a position to assist you, I will do what I can to help.

2. DEFINING

Phrase	Frequency	A practical example from an aviation environment
in the sense of		I'd like you to control the aircraft better in the sense of maintaining heading and altitude.
in relation to the		Weight is as important an element, in relation to the stalling speed of an aircraft, as the angle of attack.

3. MODIFYING

Phrase	A practical example from an aviation environment
a hell of a	There was a hell of a wind blowing from the southwest.
a bit of a	We had a bit of a problem starting our port engine this morning.
a bit of an	It's a bit of an exaggeration to say that we nearly crashed!

4. MATCHING RELATIONS

Phrase	A practical example from an aviation environment
the same sort of	The same sort of attention to detail is required by pilots and brain surgeons.
in that sort of	I have never been in that sort of situation myself so I cannot advise you on what to do.
in the sort of	If I were in the sort of situation you are in, I would get professional help.
the same kind of	It's the same kind of thing that happened when we tried to land at Carcassonne — loss of communication on approach.
exactly the same thing	Exactly the same thing happened to a colleague of mine in Tunisia.
same sort of thing	If the same sort of thing had happened to a student, it could have had serious consequences.

5. SPECIFIERS (noun plus defining item)

Phrase	A practical example from an aviation environment
in terms of the	There is no difference between these two aircraft in terms of the engine power.
in the sense that	They are different only in the sense that one has a retractable undercarriage.
of the sort of	This is typical of the sort of mistake that students make at this stage of the course.
in the case of	In the case of a faulty generator, switch off all non-essential circuits, such as warning lights.
the people in the	The people in the cabin were totally unaware of the emergency.
of the people that	Ninety-five per cent of the people that studied at this school are now flying with international carriers.

Phrase	**A practical example from an aviation environment**
the nature of the	The nature of the electrical problem was not immediately obvious.
in the sort of	We found ourselves in the sort of situation that you normally only read about in horror stories.
of the things that	One of the things that I can never remember is the procedure for signalling loss of all communications.
the sort of things	The sort of things that make me angry are negligence and lack of preparation.
sort of thing that	
in a way that	He flew the aircraft in a way that demonstrated his professional piloting skills.
in the way that	There was a sort of magic in the way that he could get his message across to students.
of the fact that	We were all conscious of the fact that he was an inspired instructor.
the fact that the	There was no doubting the fact that the gyro had failed shortly after take-off.
in such a way	He navigated in such a way that he never failed to get lost within fifteen minutes.
of the kind of	He was a prime example of the kind of pilot who would never reach old age.
in the form of	Instruction was administered in the form of sharp elbows in the ribs when you did something wrong and stern silence when you did something right.
to the fact that	We attributed this to the fact that he had learned his flying in the Foreign Legion.
sort of things that	The sort of things that made him smile were extremely hard landings and minor engine fires on start-up.
of that sort of	The benefit of that sort of instructor is that the student never suffers from overconfidence.
the sort of person	
the kind of thing	This is the kind of thing I always teach my students to avoid.
the way that the	The way that the aircraft was behaving gave rise to the suspicion that we had taken off with the tie-down still attached to the tail.
other parts of the	The windscreen was shattered but other parts of the aircraft were largely undamaged by the heavy hailstorm.

6. VERB GROUPS

Phrase	A practical example from an aviation environment
to make sure	I want you to make sure that everything in the cabin is secure.
going to get a	I'm going to get a weather forecast for Marseilles.
going to go to	We're going to go to Royanne first and St. Etienne second.
to get rid of	We may have to get rid of some fuel if we have to divert to our alternate.
get rid of the	Make sure you get rid of all the ice and snow on the upper surface of the wing.
to get hold of	I'll try to get hold of the mechanic to check the fuel drains.
going to get the	I'm now going to get the latest weather for Carcassonne.
trying to get a	I've been trying to get a fix from the NDB. Is it unserviceable?
used to live in	I used to live in Bordeaux before I moved to Lyon.
going to make a	I'm going to make a final attempt to contact Grenoble.

7. TEXTUAL

Phrase	A practical example from an aviation environment
in the first place	In the first place, you should not have started to taxi without permission. Secondly, you should have got clearance before crossing runway 7A!
to go back to	To go back to what I was saying earlier about lift vectors . . .
to get to the	I'd like to get to the point where we start to discuss the power curve . . .
going back to the	Going back to the point I made yesterday regarding the power settings for the descent . . .
to come back to	To come back to my previous point about the power curve . . .
the other thing that	The other thing that I should mention here is the need to watch engine temperatures during the climb.
going to say that	Before you asked your question, I was going to say that you should always keep an eye on your temperatures during climbs.
want to go back	I now want to go back to my previous topic for a moment in order to clarify a couple of points . . .

Phrase	A practical example from an aviation environment
just like to say	Before I conclude, I should just like to say one thing in relation to poor weather flying . . .
I want to talk to	I want to talk to you today about an important element of air legislation.
the first thing that	Before embarking on any flight, the first thing that you should consider is the weather.

8. MARKERS OF CLAUSE RELATIONS

Phrase	A practical example from an aviation environment
in order to get	In order to get an accurate weather report for your destination, you should request the latest METAR or better still contact the aerodrome directly.

9. DISCOURSE VALUE

Phrase	A practical example from an aviation environment
in the same way	Weight counteracts lift in the same way that drag counteracts speed.
the only thing that	Possibly the only thing that does not affect either speed or lift is the colour of the aircraft.
(as) a matter of fact	As a matter of fact, a bad paint job can also increase drag considerably.
in a different way	In a different way, the aerofoil section and the wing area can influence lift.
off the top of (head)	I cannot remember the formula off the top of my head.
in a sense that	A high lift aerofoil increases lift in the sense that it increases the pressure differential between the upper and lower surfaces of the wing.

10. HIGHLIGHTING AGENDA OR PURPOSE

Phrase	A practical example from an aviation environment
the end of the (day)	
nice to talk to (you)	
the number to ring	

Phrase	A practical example from an aviation environment
to get in touch	
that sort of thing	You will learn all about lift and that sort of thing in aerodynamics lectures.
that kind of thing	Volcanic eruptions can be severe hazards to aircraft in flight. Fortunately, that kind of thing doesn't happen often.
this sort of thing	While a cyclone can massively disrupt airline schedules in the Far East, this sort of thing is rare in Europe.
the sort of thing	The sort of thing that is more likely to interfere with airline schedules in Europe is industrial action.
a sort of a	A willy-willy is a sort of small localized cyclone found in hot climates.
that sort of stuff	You will learn all about that sort of stuff in your MET lectures.
in the way of	There is nothing in particular that I can give you in the way of advice about avoiding willy willies.
in a sort of	Super-cooled water is like ice in a sort of suspended animation.
this kind of thing	You don't tend to find this kind of thing at low altitudes . . .
those sort of things	You may think that those sort of things are unlikely to be a problem in Europe.
that type of thing	You may convince yourself that that type of thing couldn't happen to you.
just sort of like . . .	(colloq.) You just sort of like feel very invulnerable in an aircraft . . .
a kind of a	(colloq.) It's like being in a kind of a suit of armour . . .
in the sort of	You never expect to find yourself in the sort of situation being described here.
of the kind of	Have you any idea of the kind of action a pilot could take in these circumstances?
that kind of stuff	(colloq.) Some young pilots express the view that filling in logs and that kind of stuff is the least interesting part of learning to fly.
these sort of things	These sort of things may be boring but they are very important aspects of safety.

11. OPINION/ATTITUDE

Phrase	A practical example from an aviation environment
the most important thing	The most important thing to remember is that every rule has its origin in someone's bad experience in the past.
a good idea to	It's a good idea to try to avoid being the person responsible for having new rules added to the book.
the best way to	The best way to do this is to follow the existing rules explicitly.

12. INTERPERSONAL/INTERACTIONAL

Phrase	A practical example from an aviation environment
nice to talk to	
no no no no	
yes yes yes yes	
yeah yeah yeah yeah	
thanks very much indeed	
okay thanks very much	
just trying to think	
know the sort of	
trying to think of	

13. STATUS MARKING

Phrase	A practical example from an aviation environment
the point of view	
point of view of	
that point of view	

Appendix C

CASE STUDIES IN AVIATION LANGUAGE TESTING

1. ORAL PROFICIENCY INTERVIEW (OPI) TESTING

1.1 The oral proficiency test interview, which is normally administered face-to-face (but can be accomplished by telephone for simulated realism related to the pilot/controller language environment) and with two certified raters, lasts from 30 minutes to an hour. It assesses the candidate's listening comprehension and speaking proficiency and takes into consideration factors such as fluency, grammar, pronunciation, vocabulary, and ability to successfully work through various linguistic tasks. It consists of a warm-up, to include autobiographical information; level checks, to assess ability to perform linguistic tasks at a base level; level probes, to determine ability to perform linguistic tasks at the next higher base level; and a wind down.

1.2 The interview is rated on the U.S. Inter-agency Language Roundtable (ILR) 11-point scale of proficiency, from 0, no functional proficiency, to 5, educated native-speaker proficiency, with plus levels (0+, 1+, 2+, 3+, 4+) assigned to those people who demonstrate inconsistent proficiency at the next higher level. Examples of speaking proficiency levels are:

- *at the "0" level:* no functional ability to communicate; no topics addressable; and unintelligible speech;
- *at the "1" level:* ability to create with the language; participate in short conversations; satisfy basic survival needs; get into, through, and out of simple situations; ask and answer questions; and be understandable to native speakers used to dealing with foreigners;
- *at the "2" level:* ability to fully participate in casual conversations; give instructions; report on current, past and future activities; handle situations with complications related to concrete topics such as work requirements, family, and travel; and be understandable to a native speaker not used to dealing with foreigners;
- *at the "3" level:* ability to converse formally and informally about concrete and abstract topics; hypothesize, support opinions, and resolve problem situations; speak about unfamiliar situations; and think consistently in the target language;
- *at the "4" level:* ability to tailor language to fit the audience; counsel, persuade, and negotiate; represent a point of view on all topics normally pertinent to professional needs; and be nearly equivalent to that of an educated native speaker.

2. PELA — PROFICIENCY IN ENGLISH LANGUAGE FOR AIR TRAFFIC CONTROL

2.1 Background

2.1.1 In the 1980s, European air traffic controllers became increasingly concerned that the proficiency of the English language used in aeronautical communication between pilots and controllers was far from

ideal and varied quite considerably from State to State. In the late 1970s and early 1980s, a number of highly publicized aircraft accidents, in which language was a contributory factor, raised public concerns about safety. In June 1988, EUROCONTROL organized the first English language workshop held at the Institute of Air Navigation Services in Luxembourg. The workshop concluded that air traffic controllers should demonstrate a predetermined level of knowledge of and skills in the English language, especially in listening, pronunciation and comprehension, to enable them to carry out their tasks in such a manner as to contribute positively to the safety of air traffic.

2.1.2 A project supervision team comprising members from eleven European States was established in 1990 to monitor and guide test development. EUROCONTROL contracted the British Council in January 1992 to design a suitable test. Development, under the supervision of EUROCONTROL, was completed in December 1994 and was followed by a period of successful evaluation with the participation of more than 300 student controllers.

2.2 The PELA test

2.2.1 PELA — Proficiency in English Language for Air Traffic Control — is designed to reflect a range of tasks undertaken by air traffic controllers but with specific focus on language rather than operational procedures. To meet this requirement, a level of proficiency in general English is necessary, equivalent, for example, to the Cambridge First Certificate (United Kingdom) intermediate level, prior to commencing the specialized air traffic control (ATC) English training. The test is also specifically constructed to be administered to student controllers just prior to the completion of institutionalized training.

2.2.2 To achieve effective communication, a strict adherence to published ICAO radiotelephony phraseology is required, and in addition, students have to display the ability to produce messages in natural language, in both usual and unusual situations, that necessitate departure from ICAO phraseology. The appropriate linguistic response must be made to a message transmitted by a pilot. It is important to resolve misunderstandings in communication that may be due to limited language competency, noise and/or distortion, or to a stress-induced situation.

2.2.3 In the PELA test, there are three compulsory papers and one optional paper. A pass is required in each of the compulsory papers.

2.2.3.1 For both Paper 2 and Paper 3 of the PELA test, descriptive language rating scales, aligned to the ICAO language proficiency standard Level 4, are used to determine a candidate's level of English language proficiency.

2.2.3.2 *Paper 1 — Listening* comprises 8 sections and 83 test items (the first three are not rated) in booklet form. The candidate listens to recorded pilot messages and writes the required information (short text responses) in the space provided. Some sections are played twice. It is not a test of written English and the candidate is not penalized for grammatical errors. Test duration is approximately 40 minutes.

2.2.3.3 *Paper 2 — Oral Responses* presents the candidate with a series of 32 charts (the first two are not rated) depicting aerodrome, approach radar or en-route radar environments. The positions of aircraft on each chart are indicated by appropriate symbols. The aircraft in communication with the controller (candidate) is highlighted. For each chart, the candidate listens to a recorded pilot message and then makes an appropriate response which is recorded (for later analysis). A trained rater grades the candidate's responses for language performance and for the appropriateness of the response. Appropriateness is safety-related. The recording is played once. Test duration is about 20 minutes.

2.2.3.4 *Paper 3 — Oral Interaction* is presented in two phases on a one-to-one basis between the candidate and a trained interlocutor. Communication is not visual, with the candidate being seated behind a screen or ideally in another room. In phase 1, the interlocutor plays the role of a pilot experiencing a developing unusual situation. The candidate is the controller who must ascertain and understand the problem being experienced by the pilot. In phase 2, the candidate is required to brief the ATC supervisor (the interlocutor) about the unusual situation and may be asked to confirm and clarify information.

2.2.3.5 The scenarios in Paper 3 do not require the candidate to provide separation between aircraft or to have knowledge of local ATC procedures. Candidates are rated on their ability to understand and clarify a problem communicated by a pilot. Test duration is approximately 15 minutes.

2.2.3.6 *Paper 4 — Reading* is an optional paper containing 60 items of typical text which controllers would come across in their work.

2.3 Rating scales

The rating scales applicable to Paper 2 and Paper 3 of PELA have evolved to be aligned with the ICAO Standards for the language proficiency of pilots and controllers (Level 4 on the ICAO rating scale). The main characteristics of the rating scales are:

a) PELA requirement for pronunciation remains slightly more stringent than ICAO's.

b) Terminological consistency of descriptors is ensured, e.g.:

   1) plain language (ICAO)

   2) intelligible/intelligibility (ICAO)

c) Descriptors referring to specific features of the PELA oral sections are retained:

   1) phraseology

   2) formulaic phraseology

   3) impact on safety

d) PELA Paper 2 (Oral Responses) is rated for:

   1) appropriateness of response (safety-related)

   2) language performance features

   3) overall language performance

   4) fluency

   5) pronunciation

   6) vocabulary

   7) phraseology

e) PELA Paper 3 (Oral Interaction) is rated for:

1) overall language performance

2) comprehension

3) interaction

4) fluency

5) pronunciation

6) vocabulary

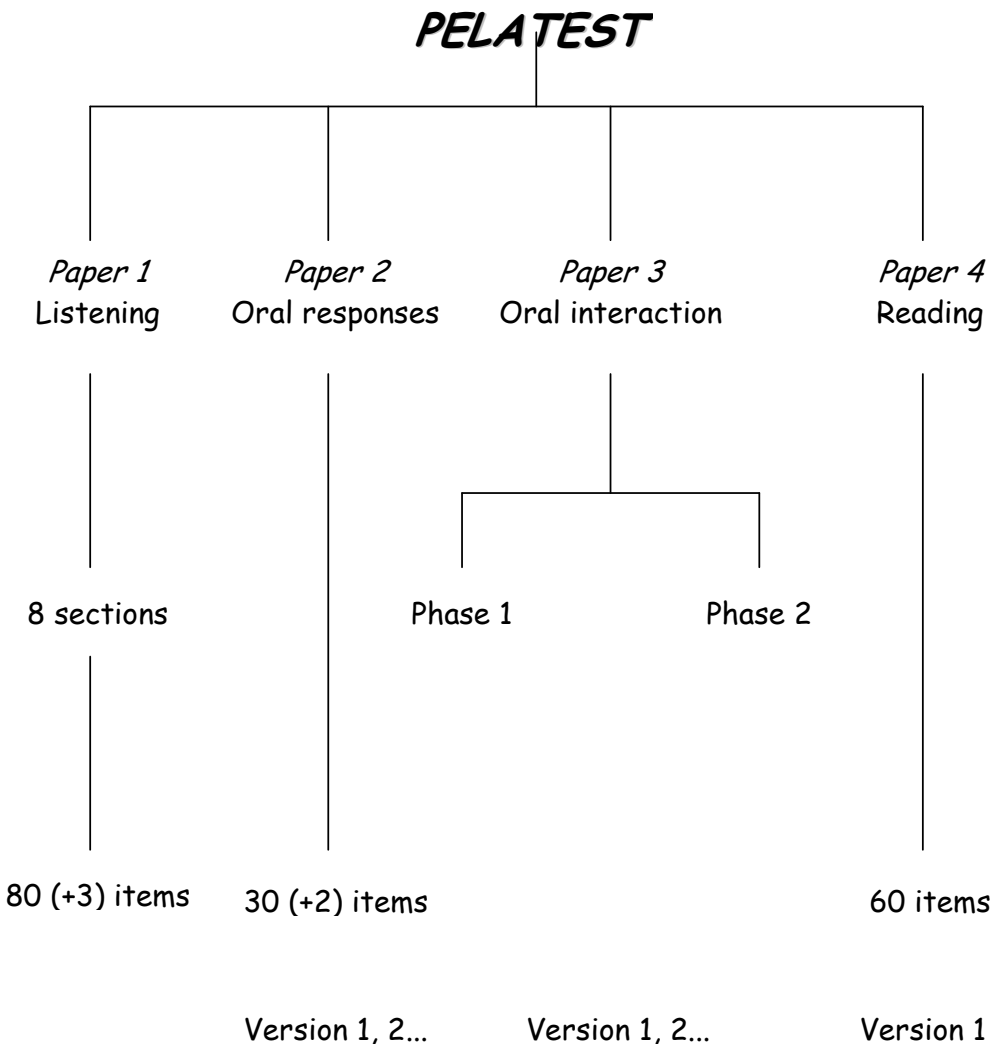
7) grammar structure

8) phraseology

2.4 Conclusion

The PELA test is well suited to serve the global ATC community in meeting the language proficiency requirements for aeronautical communications in designated international airspace.

STRUCTURE OF THE PELA TEST



Appendix D

STANDARDS FOR LANGUAGE TRAINING AND TESTING

1. TRAINING PROGRAMME STANDARDS

1.1 Many programmes follow the widely accepted professional standards for language teaching. Such programmes base curriculum decisions on research and accepted theoretical approaches and hire properly qualified instructors who are able to interact pleasantly and professionally with students, demonstrating both an enthusiasm for teaching and respect for the students. Quality programmes provide professional development opportunities for instructors, encouraging and supporting their involvement with professional associations and organizations. They limit teaching contact hours to between an ideal of twelve or fifteen hours per week and a maximum of twenty hours per week, thereby providing opportunity and time for instructors to keep abreast of professional developments and research. They monitor teaching effectiveness, seek student feedback on programme effectiveness and take time to educate students about language learning strategies.

1.2 Additionally, successful programmes tend to share a number of other programming and service characteristics: extra-curricular language supporting activities; a strong system of programme and student accountability; and content-based instruction.

1.3 A demonstrable and well-articulated adherence to professional standards ensures the best possible learning environment. As long as language teaching remains largely unregulated, organizations and individuals should carefully investigate programme qualities before committing resources. A number of professional associations publish standards to guide programme quality, e.g.:

a) American Council on the Teaching of Foreign Languages Program Standards;

b) British Council English in Britain Accreditation Scheme Handbook; and

c) Commission on English Language Program Accreditation Program Standards.

2. LANGUAGE TESTING STANDARDS — THE INTERNATIONAL LANGUAGE TESTING ASSOCIATION (ILTA) CODE OF ETHICS

The International Language Testing Association (ILTA) is a non-profit professional association dedicated to improving language-testing practices worldwide. The ILTA Code of Ethics is reprinted below, with the permission of the ILTA Board, as a guide for quality test development and use.

CODE OF ETHICS FOR THE INTERNATIONAL LANGUAGE TESTING ASSOCIATION

Adopted at the annual meeting of ILTA held in Vancouver, March 2000.

This, the first Code of Ethics prepared by the International Language Testing Association (ILTA), is a set of principles which draws upon moral philosophy and serves to guide good professional conduct. It is neither a statute nor a regulation and it does not provide guidelines for practice, but it is intended to offer a benchmark of satisfactory ethical behavior by all language testers. It is associated with a separate Code of Practice (in progress). The Code of Ethics is based on a blend of the principles of beneficence, non-maleficence, justice, a respect for autonomy and for civil society.

This Code of Ethics identifies 9 fundamental principles, each elaborated on by a series of annotations which generally clarify the nature of the principles; they prescribe what ILTA members ought to do or not do, or more generally how they ought to comport themselves or what they, or the profession, ought to aspire to; and they identify the difficulties and exceptions inherent in the application of the principles. The Annotations further elaborate the Code's sanctions, making clear that failure to uphold the Code may have serious penalties, such as withdrawal of ILTA membership on the advice of the ILTA Ethics Committee.

Although this Code derives from other similar ethical codes (stretching back into history), it does endeavor to reflect the ever changing balance of societal and cultural values across the world, and for that reason should be interpreted by language testers in conjunction with the associated Code of Practice.

All professional codes should inform professional conscience and judgement. This ILTA Code of Ethics does not release language testers from the obligations and responsibilities laid on them by other Codes to which they have subscribed or from their duties under the legal codes, both national and international, to which they may be subject.

Language testers are independent moral agents and sometimes they may have a personal moral stance, which conflicts with participation in certain procedures. They are morally entitled to refuse to participate in procedures, which would violate personal moral belief. Language testers accepting employment positions where they foresee they may be called on to be involved in situations at variance with their beliefs have a responsibility to acquaint their employer or prospective employer with this fact. Employers and colleagues have a responsibility to ensure that such language testers are not discriminated against in their workplace.

The Code of Ethics is instantiated by the Code of Practice (currently under preparation by ILTA [2004]). While the Code of Ethics focuses on the morals and ideals of the profession, the Code of Practice identifies the minimum requirements for practice in the profession and focuses on the clarification of professional misconduct and unprofessional conduct.

Both the Code of Ethics and the Code of Practice need to be responsive to the needs and changes within the profession and, in time, these Codes will require revision in response to changes in language testing and in society. The Code of Ethics will be reviewed within five years, or earlier if necessary.

Principle 1

Language testers shall have respect for the humanity and dignity of each of their test takers. They shall provide them with the best possible professional consideration and shall respect all persons' needs, values and cultures in the provision of their language testing service.

Annotation

- Language testers shall not discriminate against nor exploit their test takers on grounds of age, gender, race, ethnicity, sexual orientation, language background, creed, political affiliations or religion, nor knowingly impose their own values (for example social, spiritual, political and ideological), to the extent that they are aware of them.

- Language testers shall never exploit their clients nor try to influence them in ways that are not related to the aims of the service they are providing or the investigation they are mounting.

- Sexual relations between language testers and their test takers are always unethical.

- Teaching and researching language testing involving the use of test takers (including students) requires their consent; IT ALSO REQUIRES respect for their dignity and privacy. Those involved should be informed that their refusal to participate will not affect the quality of the language tester's service (in teaching, in research, in development, in administration). THE USE OF all forms of media (paper, electronic, video, audio) involving test takers requires informed consent before being used for secondary purposes.

- Language testers shall endeavor to communicate the information they produce to all relevant stakeholders in as meaningful a way as possible.

- Where possible, test takers should be consulted on all matters concerning their interests.

Principle 2

Language testers shall hold all information obtained in their professional capacity about their test takers in confidence and they shall use professional judgement in sharing such information.

Annotation

- In the face of the widespread use of photocopied materials and facsimile, computerized test records and data banks, the increased demand for accountability from various sources and the personal nature of the information obtained from test takers, language testers are obliged to respect test takers' right to confidentiality and to safeguard all information associated with the tester-test taker relationship.

- Confidentiality cannot be absolute, especially where the records concern students who may be competing for admissions and appointments. A careful balance must be maintained between preserving confidentiality as a fundamental aspect of the language tester's professional duty and the wider responsibility the tester has to society.

- Similarly, in appropriate cases, the language tester's professional colleagues also have a right to access data of test takers other than their own ion order to improve the service the profession offers. In such cases, those given access to data should agree to maintain confidentiality.

- Test taker data collected from sources other than the test taker directly (for example from teachers of students under test) are subject to the same principles of confidentiality.

- There may be statutory requirements on disclosure, for example where the language tester is called as an expert witness in a law court or tribunal. In such circumstances, the language tester is released from his/her professional duty to confidentiality.

Principle 3

Language testers should adhere to all relevant ethical principles embodied in national and international guidelines when undertaking any trial, experiment, treatment or other research activity.

Annotation

- Language testing progress depends on research, which necessarily involves the participation of human subjects. This research shall conform to generally accepted principles of academic inquiry, be based on a thorough knowledge of the professional literature; and be planned and executed according to the highest standards.
- All research must be justified; that is proposed studies shall be reasonably expected to provide answers to questions posed.
- The human rights of the research subject shall always take precedence over the interests of science or society.
- Where there are likely discomforts or risks to the research subject, the benefits of that research should be taken into account but must not be used in themselves to justify such discomforts or risks. If unforeseeable harmful effects occur, the research should always be stopped or modified.
- An independent Ethics Committee should evaluate all research proposals in order to ensure that studies conform to the highest scientific and ethical standards.
- Relevant information about the aims, methods, risks and discomforts of the research shall be given to the subject in advance. The information shall be conveyed in such a way that it is fully understood. Consent shall be free, without pressure, coercion or duress.
- The subject shall be free to refuse to participate in or to withdraw from, the research at any time prior to publication of research results. Such refusal shall not jeopardize the subject's treatment.
- Special care shall be taken with regard to obtaining prior consent in the case of subjects who are in dependent relationships (for example, students, the elderly, proficiency challenged learners).
- In the case of a minor, consent shall be obtained from a parent or guardian but also from the child if he is of sufficient maturity and understanding.
- Confidential information obtained in research shall not be used for purposes other than THOSE specified in the approved research protocol.
- Publication of research results shall be truthful and accurate.
- Publication of research reports shall not permit identification of the subjects who have been involved.

Principle 4

Language testers shall not allow the misuse of their professional knowledge or skills, in so far as they are able.

Annotation

- Language testers shall not knowingly use their professional knowledge or skills to advance purposes inimical to their test takers' interests. When the progress of the tester's intervention is not directly to the benefit of the test

takers (for example when they are asked to act as trial subjects for a proficiency test designed for some other situation), its nature shall be made absolutely clear.

- Non-conformity with a society's prevailing moral, religious etc values, or status as an unwelcome migrant, shall not be the determining factor in assessing language ability.

- Whatever the legal circumstances, language testers shall not participate, either directly or indirectly in the practice of torture or other forms of cruel, inhuman or degrading punishment (see Declaration of Tokyo 1975).

Principle 5

Language testers shall continue to develop their professional knowledge, sharing this knowledge with colleagues and other language professionals.

Annotation

- Continued learning and advancing one's knowledge are fundamental to the professional role; failure to do so constitutes a disservice to test takers.

- Language testers shall make use of the various methods of continuing education that are available to them. These may involve participation in continuing language testing programmes and professional conferences, and the regular reading of relevant professional publications.

- Language testers shall take the opportunity to interact with colleagues and other relevant language professionals as an important means of developing their professional knowledge.

- Language testers shall share new knowledge with colleagues by publication in recognized professional journals or at meetings.

- Language testers shall be expected to contribute to the education and professional development of language testers in training and to the drawing up of guidelines for the core requirements of that training.

- Language testers shall be prepared to contribute to the education of students in the WIDER language professions.

Principle 6

Language testers shall share the responsibility of upholding the integrity of the language testing profession.

Annotation

- Language testers shall promote and enhance the integrity of their profession by fostering a sense of trust and mutual responsibility among colleagues. In the event of differences of opinion, viewpoints should be expressed with candour and respect rather than by mutual denigration.

- Language testers develop and exercise norms on behalf of society. As such theirs is a privileged position which brings with it an obligation to maintain appropriate personal and moral standards in their professional practice, and in those aspects of their personal life which may reflect upon the integrity of that practice.

- Language testers who become aware of unprofessional conduct by a colleague shall take appropriate action; this may include a report to the relevant authorities.

- Failure to uphold this Code of Ethics will be regarded with the utmost seriousness and could lead to severe penalties including withdrawal of ILTA membership.

Principle 7

Language testers in their societal roles shall strive to improve the quality of language testing, assessment and teaching services, promote the just allocation of those services and contribute to the education of society regarding language learning and language proficiency.

Annotation

- Language testers have a particular duty to promote the improvement of language testing provision/services in that many of their test takers are disenfranchised and lack power on account of their non-native speaker status.

- Language testers shall be prepared by virtue of their knowledge and experience to advise those responsible for the provision of language testing services.

- Language testers shall be prepared to act as advocates and join with others in ensuring that language testing test takers have available to them the best possible language testing service.

- Language testers shall be prepared to work with advisory, statutory, voluntary and commercial bodies that have a role in the provision of language testing services.

- Language testers shall take appropriate action if services, by reason of fiscal restriction or otherwise, fall below minimal standards. Exceptionally, language testers may have to dissociate themselves from such services provided that this is not harmful to their test takers.

- Language testers shall be prepared to interpret and disseminate relevant scientific information and established professional opinions to society. In so doing, language testers shall clarify their status as either spokespersons for a recognised professional body or not. If the views expressed are contrary to those generally held, they shall so indicate.

- It is reasonable for language testers to make scientifically substantiated contributions to public debate on sensitive socio-political issues, such as race, disadvantage and child rearing.

- Language testers shall differentiate between their role as educators based on professional knowledge and their role as citizens.

- In fulfilling their responsibilities under this principle, language testers shall take care to avoid self-promotion and the denigration of colleagues.

- Language testers shall make clear that they do not claim (and are not seen to claim) that they alone possess all the relevant knowledge.

Principle 8

Language testers shall be mindful of their obligations to the society within which they work, while recognising that those obligations may on occasion conflict with their responsibilities to their test takers and to other stakeholders.

Annotation

- When test results are obtained on behalf of institutions (government departments, professional bodies, universities, schools, companies) language testers have an obligation to report those results accurately, however unwelcome they may be to the test takers and other stakeholders (families, prospective employers etc).

- As members of the society in which they work, language testers should recognise their obligation to the testing requirements of that society, even when they may not themselves agree with them. Where their disagreement is of sufficient strength to qualify as a conscientious objection, they should have the right to withdraw their professional services.

Principle 9

Language testers shall regularly consider the potential effects, both short and long term on all stakeholders of their projects, reserving the right to withhold their professional services on the grounds of conscience.

Annotation

- As professionals, language testers have the responsibility to evaluate the ethical consequences of the projects submitted to them. While they cannot consider all possible eventualities, they should engage in a thorough evaluation of the likely consequences and, where those consequences are in their view professionally unacceptable, withdraw their services. In such cases, they should as a matter of course consult with fellow language testers to determine how far their view is shared, always reserving the right, where their colleagues take a different view, to make an individual stand on the grounds of conscience.

3. LANGUAGE TESTING STANDARDS — THE JAPAN LANGUAGE TESTING ASSOCIATION (JLTA) CODE OF PRACTICE

The Japan Language Testing Association (JLTA) has developed a draft Code of Practice for local use. It was developed by Professor Randy Fisher for JLTA and is reprinted below, with the permission of JLTA, as a guide for the development of other codes of practice.

THE JLTA CODE OF GOOD TESTING PRACTICE

Basic Considerations for good testing practice in all situations

1. The test developer's understanding of just what the test, and each sub-part of it, is supposed to measure (its construct) must be clearly stated.

2. All tests, regardless of their purpose or use, must be valid and reliable to the degree necessary to allow the decisions based on their results to fair to the test takers.

> Validity refers to the accuracy of the inferences that are drawn from the test results. If, for example, the test purports to be measuring the ability to use English in business communication, the test is valid to the degree it does in fact measure that ability. However, the ability to use English in business communication is a construct. The test developer must spell out just what that construct is or what it consists of. The test can only be valid if the test construct is a complete and accurate picture of the skill or ability it is supposed to measure. To summarize Messick 1996, construct validity depends on the degree to which positive answers can be given to the following five questions.
> 1. Does our construct and our implementation of it, include all and only the necessary elements?
> 2. Do we have these elements correctly weighted?
> 3. Do these elements interact in the same way in the test task and in real world performance?
> 4. Does our scoring scheme evaluate the test performance in the same way real-world performance is evaluated?
> 5. Is there anything about our test that will cause the test takers, or a portion of them, to perform in a less than optimal fashion?

> Reliability refers to the consistency of the test results and Messick's sixth question addresses this issue.
> 1. Are the results generalizable?
>   a. Are the results comparable across time?
>   b. Are the results comparable across settings?

Responsibilities of test designers and test writers

1. A test designer must begin by deciding on the construct to be measured before deciding how that construct is to be operationalized.

2. Once the test tasks have been decided, their specifications should be spelled out in detail.

3. The work of the item writers needs to be edited before the items are pretested. If pretesting is not possible, the items should be analysed after the test has been administrated but before the results are reported. Malfunctioning or misfitting items should not be included in the calculation of individual test takers' reported scores.

4. Grading check sheets or rubrics must be prepared for test tasks requiring hand scoring. These check sheets or rubrics must be tried out to demonstrate that they permit reliable evaluation of the test takers' performance.

5. Those doing the grading should be trained for the task and both inter and intra-rater reliability should be calculated and published.

6. Test materials should be kept in a safe place and handled in such a way that no test taker is allowed to gain an unfair advantage over the other test takers.

7. Care must be taken to assure that all test takers are treated in the same way in the administration of the test.

8. Grading procedures must be carefully followed and score processing routines checked to make certain that no mistakes have been made.

9. The test results should be reported in a way that allows the test taker and other stakeholders to draw the correct inferences from it.

Obligations of institutions preparing or administering high stakes exams

Institutions (schools, companies, certification bodies, etc.) developing and administering entrance, certification, or other high stakes examinations must utilize test designers and item writers who are well versed in current language testing theory and practice and have native or near native competence in the language being tested. Items written by non-native speakers of the language being tested must be checked by competent native speakers.

Responsibilities to test takers and related stakeholders:

Before the test is administered.

The institution should provide all potential test takers with adequate information about the nature of the test, the construct (or constructs) the test is attempting to measure (Ideally this should include any evidence and arguments showing that the test tasks are in fact measuring what they are claimed to measure.), the way the test will be graded, and how the results will be reported.

At the time of administration.

The institution shall provide facilities for the administration of the test that do not disadvantage any test taker. Test administration materials should be carefully prepared and proctors trained and supervised so that each administration of the test can be uniform, assuring that all test takers receive the same instructions, time to do the test, and access to any permitted aids. If something occurs that calls into question the uniformity of the administration of the test, the problem should be identified and any remedial action to be taken to offset the negative impact on the effected test takers should be promptly announced.

At the time of scoring.

The institution shall take the steps necessary to see that each test taker's exam paper is graded accurately and the result correctly placed in the data-base used in the assessment. There should be on-going quality control checks to assure that the scoring process is working as intended.

Other considerations.

If a decision must be made on candidates who did not all take the same test or the same form of a test, care must be taken to assure that the different measures used are in fact comparable. Equivalence must be demonstrated statistically.

If more than one form of the test is used, inter-form reliability estimates should be published as soon as they are available.

Obligations of those preparing and administering commercially available exams

In addition to the obligations placed on any test designer and on those preparing high stakes examinations, developers and sellers of commercially available examinations must:

1. Make a clear statement as to what groups the test is appropriate for and for which groups it is not appropriate.

2. Make a clear statement of the construct the test is designed to measure in terms a layperson can understand.

3. Publish validity and reliability estimates for the test along with sufficient explanation to allow potential uses to decide if the test is suitable in their situation.

4. Report the results in a form that will allow the test users to draw correct inferences from them and make them difficult to misinterpret.

5. Refrain from making any false or misleading claims about the test.

6. Produce a test manual available to the public which:

    1. Explains the relevant measurement concepts so that they can be understood by non-specialists.

    2. Reports evidence of the reliability and validity of the test.

    3. Describes the scoring procedure and, if multiple forms exist, steps taken to assure consistency of results across forms.

    4. Explains the proper interpretation of test results and any limitations on their accuracy.

Responsibilities of users of test results

Persons who utilize test results for decision making must:

1. Use results from a test that is sufficiently reliable and valid to allow fair decisions to be made.

2. Make certain that the test construct is relevant to the decision to be made.

3. Clearly understand the limitations of the test results on which they will base their decision.

4. Take into consideration the standard error of measurement (SEM) of the device that provides the data for their decision.

5. Be prepared to explain and provide evidence of the fairness and accuracy of their decision making process.

Special considerations

In norm-referenced testing

1. The characteristics of the population on which the test was normed must be reported so that test users can determine if this group is appropriate as a standard to which their test takers can be compared

In criterion referenced testing

1. The appropriateness of the criterion must be confirmed by experts in the area being tested.

2. Since correlation is not a suitable way of determining the reliability and validity of criterion referenced tests, methods appropriate for such test data must be used.

In computer adaptive testing

1. The sample sizes must be large enough to assure the stability of the IRT estimates.

2. Test takers and other stakeholders must be informed of the rationale of computer adaptive testing and given advice on test taking strategies for such tests.

Appendix E

PART I: REFERENCES

Aviation Language

This list of articles which examines the use of language in aeronautical radiotelephony communications is not intended to be exhaustive.

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The literature on linguistics and on language learning, teaching, and testing is vast. Only a small sampling of a few useful works is listed here, including those texts referred to in this manual. *A Bibliography on Language Testing* has been compiled and published by The Journal Language Testing Update, with the International Language Testing Association (ILTA).

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PART II: WHAT IS NOT STANDARD IN REAL RADIOTELEPHONY?

Standards of language use in aeronautical radiotelephony need to be productive (being concise while avoiding misunderstandings) but also acceptable to users. Examples of naturally occurring non-standard usage can provide valuable clues to what should or can be standardized. Only by comparing many instances of real language use by different individuals in similar situations is it possible to get an accurate idea of the nature of non-standard variations.

This part presents advance results of the analysis of the English parts of a corpus of recorded en-route R/T (7 000 pilot and controller messages). Attention is drawn to the different levels of variation and the types of variation observed in a selection of message types with a view to establishing a sound basis for the definition of standards. It will also be pointed out that some message categories are **not** taken into account in the official phraseologies.

1. INTRODUCTION

1.1 Routine versus non-routine

1.1.1 Numerous recent official reports, articles in aviation journals, and linguistic studies have drawn attention to the influence of radiotelephony communications in English on the outcome of aviation incidents. Language errors have been cited as primary causes or aggravating factors when things start to go wrong in the air or on the ground.

1.1.2 While studies of non-routine situations point users and trainers to the (all too important) danger areas in radiotelephony, they cannot provide the overview of the contextual and psychological factors that determine language requirements, which are needed for language planning at all levels, from the creation of official procedures to language training in local establishments.

1.1.3 Consistent patterns of usage in routine communications can provide us with valuable information about the communicative needs of pilots and controllers, while observed variations in the formulation of similar messages, or in the organization of the dialogue, can allow us to make informed decisions about their acceptability in safety critical contexts.

1.2 Why study non-standard routine radiotelephony communications?

1.2.1 The aim here is not, initially, to draw attention to variations as examples of non-standard phraseology. It is assumed that all forms of language (choice of words, uses of syntax, intonation, stress) are translations of individual communicative needs. This translation is occasionally carried out consciously but, for the most part, takes place at unconscious levels, particularly in the resolution of problems in real time.

1.2.2 The underlying assumption is that all needs are of equal value[1]. Before deciding whether a given need and its linguistic expression should be taken into account in the definition of standards, we will need to see:

a) whether it is widely represented among the users; and

b) whether it is in potential conflict with the basic requirements of clarity and concision.

1.2.3 ICAO documents provide the norms for worldwide communications in the most commonly occurring situations of air navigation. These do not constitute a code but a restricted sub-language derived from an already existing natural language; this is both its strength and its weakness. As a sub-language, it has benefitted from resources of the wider language from which it is derived to meet the requirements of changing technology. Modifications to the recommendations in the early 1980s took into account lessons learned from observed misunderstandings (e.g. restrictions on the use of the word “cleared”, and conversion of “affirmative” to “affirm” to avoid confusions with “negative” when only the final syllable is heard). It has proven to be a flexible and easily useable tool.

1.2.4 It is, however, and for the very same reasons, an unpredictable tool. It is difficult for users in some circumstances to dissociate it from the needs expressed by the wider language. In addition, we will observe that some commonly occurring messages in R/T are not catered to by the phraseology, that the recommendations themselves provide contradictory norms, and that in these cases, users make use of their (variable) command of the source language to get their message across.

What are the norms?

1.2.5 Before attempting to identify cases of “non-standard” usage, it is necessary to define the norms for standard usage. However, even in the highly standardized world of air traffic control, this is by no means an easy task.

1.2.6 The ICAO Standards mentioned in 1.2.3 would seem to be an obvious candidate for external norms, but these may or may not be adopted in their entirety by Contracting States (who must nevertheless notify ICAO of any differences that they intend to adopt), and this leads to small differences of phraseology from one country to another. Within one country, local conditions, such as traffic patterns and ATC equipment, can lead to the creation of a specialized phraseology to cover cases not included in ICAO recommendations. Finally, within one workplace (ground station or airline), idiosyncratic changes to phraseology may become a local norm.

1.2.7 Alternatively, one could base the analysis on internal norms — that is to say, on norms that are inherent to the corpus itself. In this case, it is the frequent patterns of language use that establish the norm for a given message type. Less frequent patterns may be interpreted as deviations from this norm, but they may, in some cases, constitute evidence of the need to create a new message type.

1.2.8 It is these internal norms that have been adopted in our study as a starting point for an analysis of the corpus. Observed patterns of language use will subsequently be compared with the official

1. Such needs (apart from the fundamental requirement of communicating information and instructions clearly and concisely while avoiding ambiguity) will be as diverse as emphasizing a particular part of the message, linking up with previous messages, being polite, expressing urgency, authority, displeasure, etc., maintaining conversational rhythm, displaying group membership. Some of these needs may be in conflict with each other — the use of a minority jargon to display group membership may disregard the requirement for clarity.

procedures established by the French Direction Générale de l'Aviation Civile in the document *Procédures de la Radiotéléphonie à l'Usage de la Circulation Aérienne* (DGAC/SIA 1985).

2. PRESENTATION OF THE STUDY

2.1 Objectives and methods

2.1.1 The study initially involved the collection of an extensive corpus of recorded conversations between a variety of pilots and controllers in European airspace during the en-route phase of flight. These conversations were recorded both on the ground (8 sectors) and in the air (16 complete flights). They took place in English and in French and involved English, French, Portuguese and Spanish controllers.

2.1.2 These conversations were subsequently transcribed and divided into numbered turns (uninterrupted utterances by one speaker) and numbered speech acts (individual messages within each turn). The resulting text was then used to create a database of speech acts.

2.1.3 The primary aims of the study are to analyse characteristics of en-route R/T under two headings:

a) utterance characteristics:

— what messages are formulated? (semantic and pragmatic features)

— what are the different linguistic formulations of the same message? (lexical, syntactical and prosodic variation)

b) interaction characteristics:

— how are messages distributed throughout the dialogue?

— how are messages sequenced and linked within turns? (turn structure)

— how are messages sequenced and linked between turns? (exchange structure)

— when do the different speakers tend to initiate exchanges?

2.1.4 In addition, we have collected information about the extra-linguistic context of each speech act to enable us to investigate the situational variables that may have a direct effect on linguistic features. Among these variables, we have paid particular attention to:

— traffic density

— professional qualification of speaker

— native/non-native speaker status

— phase of flight/type of sector

2.2 The database

2.2.1 The database has been constructed using the ORACLE relational database management system. The query language is SQL PLUS.

2.2.2 The principal table of the database contains the text of speech acts of the corpus (one speech act for each row of the table) and, in adjacent columns, the results of a manual analysis of the speech acts consisting of the following:

a) speech act meaning:

- illocutionary force (giving instructions, requesting information, greeting, etc.)
- topic (flight level, route, weather, etc.)
- sub-topic (climb, descend, maintain)
- additional components (modalisation, qualification)
- communication problems

b) speech act formulation:

- language used
- syntactic structure
- ellipsis
- prosodic marking
- cohesive devices
- hesitation phenomena
- conformity to phraseology

c) dialogue structure:

- sequential structure of the turns and speech acts
- relationships between acts within a turn (subordination)
- exchange structure (initiation, reaction)
- relationships between exchanges

(The analysis of the dialogue structure is based on recent work done in the area of discourse analysis, and in particular on the model developed by linguists working with Professor Eddy Roulet in Geneva.)

2.2.3 Other tables in the database contain situational information concerning:

— speakers (nationality, experience, etc.)

— flights (type of aircraft, route, weather conditions, etc.)

— control sectors (traffic density, geographical location, etc.)

— recordings (date, time, etc.)

2.2.4 Queries of the database allow two principal types of analysis:

— extraction of the text of speech acts according to specified criteria or combinations of criteria[2]

— frequency counts of speech acts in the database

2.2.5 While the minimum unit of analysis is the speech act, it is nonetheless possible to carry out an analysis of the individual items of vocabulary (word counts and word searches) using the same query language and other software tools.

2.3 Statistical presentation of the corpus

The corpus is constituted as follows:

Length	14 330 words
Vocabulary	1 303 distinct words
Total number of speech acts	6 850
Number of different speech acts	250
Number of different utterances	3 461
Total number of exchanges	2 155
— initiated by pilot	828
— initiated by controller	1 327

(Dialogue in English represents approximately 70 per cent of these totals.)

Note. — Figures are compiled from utterances that include number/letter sequences, place names and aircraft operator names. These variables will be excluded from utterances in later counts in order to give a more accurate view of variations.

2. For example, it is possible to display all climb instructions given by the controllers represented in the database and to group them according to such variables as native-speaker status, density of traffic, and syntactic structure.

3. SOME RESULTS OF THE ANALYSIS

3.1 A breakdown of the communicative tasks

Analysis of the speech acts reveals that only one-third, in the form of instructions and information, are directly concerned with the management of aircraft movements, while two-thirds are devoted to the management of the communication itself. Thirty-three per cent of the total number of acts are turn-management acts — that is, they serve to identify who is speaking to whom. A further 26 per cent manage the different means of communication between pilot and controller (radio frequencies, transponder codes, radar contact) and 5 per cent are “repairs”, serving to clarify misunderstandings. Such a high proportion of “conversation about the conversation” may seem surprising, but this reflects the tenuous nature of the links between aircraft and ground stations, and the very real risks of confusion.

3.2 Level instructions (controller)

3.2.1 Instructions to climb, descend or maintain level are among the most frequent speech acts of the controller (278 occurrences in our corpus — 13.5 per cent of all controller messages).

3.2.2 The basic syntactic pattern for formulating these instructions is:

VERB PHRASE + FLIGHT LEVEL PARAMETER

3.2.2.1 There is, however, a great deal of variation in the formulation of each of these two elements. While in the majority of occurrences the verb phrase uses the imperative form of the verbs “climb”, “descend”, “maintain” or “continue”, a significant number (36) use complete or abbreviated passive forms of the verbs “cleared” and “recleared”. (The use of the terms “continue” and “recleared” is an example of a widespread tendency for speakers to acknowledge links with preceding discourse.)[3] In four cases, the verb is omitted entirely or replaced by a prepositional phrase (“Down to . . .”), whereas in three cases both “climb” and “maintain” are used in the same message.

3.2.2.2 The flight level parameter is also subject to extensive variation. In 54 occurrences, most of which are instructions to maintain level, the parameter consists simply of the flight level number, while in a further 10 occurrences there is no explicit mention of the parameter at all (“Maintain”). In these cases, the instruction is in response to a message from the pilot in which the present flight level has been stated. Once again, and this time through ellipsis, the controller establishes a link with the preceding discourse — and saves time.

3.2.2.3 Another form of variation is the addition of a preposition between the verb phrase and the parameter — including “to”, notorious for its possible confusion with the number “two” (“Climb to 3 5 0” is attested in the corpus). Other additions are the adverbial elements “immediately”, “initially” and “(for the) time being”. While the first has official status as a marker of urgency, the two others seem to be frequent enough (28 occurrences) to constitute an element of unofficial phraseology whereby speakers can inform

3 . The fact that phraseology is presented as a list of discrete messages means that this communicative need is not catered for. Other signs of its importance for speakers are: other verbs prefixed by “re-”; the addition of “now” to some instructions; the use of linking words (“and”, “so”, etc., “you can if you wish”); words with deictic reference (“this radar heading”, “that’ll be final”) . While some of these devices may be seen as ways of economizing on language, and thereby achieving conclusion, another communicative need may be at work here, namely, by exercising mastery of the discourse, speakers may be ensuring the listener’s confidence in their mastery of the situation.

the addressee of their plans for the future. In this case, controllers reassure pilots as to their intention to provide further instructions and thereby forestall further questioning from pilots.

3.2.2.4 The positioning of these adverbials in the message is variable. “Initially” occurs both in medial (between the verb phrase and the flight level parameter) and final positions — nine and eight occurrences, respectively. Three out of the eight occurrences of “(for the) time being” are in the initial position. All three occurrences of “immediately” are in the medial position. The tendency to avoid the initial position for adverbials (the position recommended by phraseology for “immediately” and similar words) may be due to cognitive preferences in the ordering of elements and/or to considerations of sentence rhythm.

3.2.2.5 Only 31 per cent of all “level” instructions in English are standard with respect to phraseology. In these cases, native speakers show a higher level of standardization (46 per cent of utterances are standard) than non-native speakers. It should be pointed out that official procedures are contradictory on the use of the preposition “to” in front of flight level parameters, since both “CLIMB (or DESCEND) (level)” and “CONTINUE CLIMB (or DESCENT) TO (level)” are proposed.

3.3 Present level information (pilot)

3.3.1 Information given by the pilot to the controller concerning flight level may concern the present or future level. The corpus contains 244 speech acts of this type in English (14 per cent of all pilot messages), of which 200 concern a present level.

3.3.2 The most frequent syntactic pattern is made up of a verbless statement of the flight level parameter. However, this pattern accounts for only a slim majority (56 per cent) of the occurrences, and consistent patterns of variation can be observed.

3.3.3 As in controller instructions, there may be omission of the marker “flight level” (83 occurrences) or omission of the word “flight” (54 occurrences). This latter variant gives rise to potentially ambiguous utterances like “level 2 9 0”, where the word “level” can be considered as an adjective describing the aircraft’s current flight attitude or as a noun identifying the aircraft’s current level regardless of its attitude.

3.3.4 The addition of a prepositional or verb phrase in front of the flight level parameter is a very common feature of these messages (107 occurrences) and can be interpreted as a need for the pilot to add to his information about the aircraft’s current vertical position, an indication of the aircraft’s current vertical movement.

3.3.5 Verb phrases are usually in the verb+ING form, and prepositional phrases can be grouped according to notions with reference to a fixed point:

— “at”; “maintaining” (34 occurrences): no change of level, no change of attitude

— “levelling” (3 occurrences): no change of level, change of attitude

— “reaching”; “approaching”; “coming to” (11 occurrences)

— “crossing”; “passing” (17 occurrences): change of level, no change of attitude

— “leaving”; “out of” (25 occurrences): change of level, change of attitude

3.3.5.1 This would seem to be a widely felt communicative need for pilots, for which no message type is officially provided. A certain consensus exists on terminology, but each different notion is expressed by more

than one variant. Indeed, one controller informed us that he interprets differently the utterances "Approaching flight level 2 5 0" and "Reaching flight level 2 5 0". While the latter is a simple statement of current movement and level, the former is a gentle reminder by the pilot that a further climb or descent clearance is expected.

3.3.5.2 Sixty-eight per cent of the utterances use non-standard phraseology, which specifies only one message type.

3.4 Indirect speech acts

3.4.1 The example of the different interpretations of "approaching" and "reaching" points to the infrequent, but consistently present, phenomenon of speech acts that are "not what they seem", or "indirect" speech acts. These have the linguistic form of one type of speech act (e.g. "giving information") but are interpreted by listeners as a different type of speech act (e.g. "requesting action"). Everyday conversation provides a multitude of indirect speech acts, which are often associated with attempts at "face-saving", i.e. preserving one's reputation or dignity. Speakers may "face-save" for themselves and for the listeners by formulating a request in such a way that the listeners' freedom of action is not impinged upon, while diminishing the embarrassment of a possible refusal.[4] The mechanisms that result in listeners making correct inferences about the true intention behind such speech acts are complex and subject to error — but they are highly dependent on all participants' knowledge of the relevant context.

3.4.2 Indirect speech acts are common enough in our corpus to merit close examination. There are 48 occurrences, of which 43 are pilot messages. Not surprisingly, they are most frequent where the speakers are using their native language, and they mostly concern requests for levels and routes that are not in the flight plan. The variety and length of some of the utterances, and their punctuation by hesitation noises, betray the difficult nature of the problem!

— "Can you give us some idea as to euh when we can euh expect higher level?"

— "We could go to the euh Toulouse VOR, tango oscar uniform."

— "If Fl is available, we would be obliged."

— "x is standing by for Fl should it become available."

— "Is there any chance of Fl?"

3.4.3 Common features of these utterances are that they are disguised as messages giving or requesting information, and that they make use of a modal element expressing the notion of feasibility or capability.[5] One is tempted to conclude that the official procedure for requesting a clearance (REQUEST CLIMB . . .), which is definitely a direct speech act, does not always correspond to imperatives felt by pilots to save face!

4 . "Brr, it's cold in here" is more likely to be interpreted as a request for the listener to close a window, or at least to give permission to the speaker to do so, than as a simple piece of information or the starting point of a chat about the weather.

5 . This notion seems to be an important one for pilots and controllers to express in their messages, since it is a component of 43 speech acts in the corpus. (Other common modal notions are those of wishes and future likelihood.) Official phraseology is not clear on this point as it provides more than one syntactic pattern for R/T users to model other messages on:
11.2.3.4 (c) CAN YOU CLIMB . . . ?
11.3.4 (b) ADVISE IF ABLE TO CROSS . . . ?

3.4.4 Taken out of context, such messages are difficult to interpret. However, a small minority (4 occurrences where French is being spoken as a native language) remain ambiguous even in context, leaving the agreed status of the speech act uncertain. They are all requests from the controller to the pilot about the ability of the pilot to accelerate or turn.

C. Vous pouvez accélérer la descente vers 50?	P. Affirmatif madame. On y va.
[C: Could you accelerate *the descent to 50?*	*P: Affirmative, madam. Let's go.]*

3.4.5 The messages use a declarative syntax and are marked as questions by rising intonation only. In the example above, the pilot replies twice: once to the request for information and once to the implicit instruction.

3.5 Comments

We have seen that language variation, both internally and in relation to external norms, is a constant feature of routine R/T. Some variations may be judged to be insignificant, while others have definite implications for the mutual understanding of intentions. Training should sensitize users to these areas.

3.6 Conclusion

3.6.1 The following dialogue (attested in the corpus) takes place between two native speakers of English in the lower airspace in the vicinity of a major airport. Two aircraft are descending towards the airfield:

1	P	euh Fox Charlie who's ahead euh us or Golf Yankee?
2	C	well you're neck and neck
3	P	euh: we can euh keep a high speed in the descent if you want us to
4	C	euh yeah I don't know how the TMA are going to plan this you can if you wish
5	P	you're the boss
6	C	well they'll be the boss when you get down there euh I I'm just sort of keeping you apart for the moment
7	P	Understood

3.6.1.1 While this conversation will no doubt meet with the disapproval of phraseological purists, it serves to underline the fact that, through radiotelephony, and despite the careful precautions of air navigation bodies at all levels, the respective roles of pilot and controller are liable to undergo frequent renegotiation.

3.6.1.2 It is also a striking example of the kind of strain put on non-native speakers of English as they try to visualize surrounding traffic while listening in on the radio.

3.6.2 Many variations can be seen in the variety of communicative needs, apart from the stated aims of concision and clarity. It is these needs that must be evaluated before official language standards are decided on and, if necessary, new message categories are created. In any case, the needs can provide valuable input for the language training of pilots and controllers.

— END —