The Use of English in Aviation

Simon Cookson

"It is a widely believed myth that the aviation language is English. It isn’t. It is Aviation English which is a very different thing." (Henrik sen 2003:11.)

Abstract

English is the de facto language of international air transport, but what exactly is aviation English and how is it used? Pilots and air traffic controllers communicate with each other using a combination of radiotelephony phraseology and plain English. While the system usually works well, some of the worst accidents in aviation history have been caused in part by breakdowns in communication between pilots and controllers. As a result, the International Civil Aviation Organization (ICAO) has taken steps to try to improve the language proficiency of all pilots and controllers involved in international flights. The ICAO language proficiency rating scale, which came into effect in March 2008, has implications for the English language training of students on the Flight Operations Program at J. F. Oberlin University.

Introduction

Shortly after 5pm on March 27 1977 a Pan Am Boeing 747 that was taxiiing through fog at Los Rodeos Airport in Tenerife was struck by a KLM Boeing 747 that was midway through its takeoff roll. The result was the worst accident
in aviation history, with 583 fatalities.

A number of factors contributed to the Tenerife disaster. In addition to very low visibility brought about by the poor weather conditions, these contributing factors included plane diversions caused by a bomb alert at Las Palmas Airport in Gran Canaria and interference in radio communications between the control tower at Los Rodeos Airport and the two aircraft. To use a metaphor popular in the field of human factors, gaps in the defensive layers of the system were lined up so that the accident trajectory could penetrate all of the layers like a skewer passing through holes in slices of Swiss cheese. (See Maurino et al. 1995:23–25 or Wiegmann & Shappell, 2003:47–49.)

There were also some language issues. Cushing (1994:9–10) provides a partial transcript for the disaster, and analysis of these issues. He makes the observation that one contributing factor to the disaster was confusion surrounding the phrase "at takeoff":

"... the accident at Los Rodeos airport, Tenerife, the Canary Islands, on 27 March 1977 resulted in part from a misunderstanding of the phrase at takeoff, which was used by the flight crew to indicate that they were "in the process of taking off" but was understood by the tower controller as meaning "at the takeoff point." (Cushing 1994:1.)

The Tenerife disaster arose, like many aviation accidents, from the unfortunate co-incidence of a complex series of factors. The factors included language issues, and this paper describes steps that have been taken recently to address communication problems in aviation in order to prevent such an accident ever happening again. The paper also addresses the question of whether English is indeed the international language of aviation, and it breaks aviation English down into the two component parts of radiotelephony phraseology and plain English, both of which are important to the pilot trainees at J. F. Oberlin University.
The ICAO language proficiency requirements

The International Civil Aviation Organization (ICAO) is an agency of the United Nations that is tasked with overseeing international air transport. ICAO has its headquarters in Montreal, Canada, and since its founding in 1944 it has grown into an organization with over 180 Contracting States and seven regional offices worldwide.

For the last decade ICAO has been implementing a program that is meant to improve the language proficiency of pilots and air traffic controllers around the world. This program has seen the development of language proficiency requirements (LPRs) and a 6-level language proficiency rating scale, which is reproduced in the Appendix. From March 2008 all pilots and controllers involved in international flights must demonstrate proficiency at level 4 or higher on this scale, as is made clear in Section 1.1 of Attachment B to ICAO State Letter AN 12/44.6–07/68:

"The decision to address language proficiency for pilots and air traffic controllers is long standing and was first made by the 32nd Session of the [ICAO] Assembly in September 1998 as a direct response to an accident that cost the lives of 349 persons, as well as previous fatal accidents where the lack of proficiency in English was a causal factor ... As of 5 March 2008, the ability to speak and understand the language used for radiotelephony that is currently required for pilots and air traffic controllers will have to be demonstrated based on the ICAO holistic descriptors and language proficiency rating scale (at Level 4 or above).”

In late 2007 and early 2008, ICAO organised a series of workshops to explain to national administrators and operators how the language proficiency requirements should be implemented. The Asia and Pacific region workshop was held in Bangkok at the end of January 2008, and in his opening remarks to the workshop, Mokhtar A. Awan, Regional Director of the ICAO Asia and Pacific Office, said that “the importance of language proficiency cannot be overstated.” This sentiment was echoed by Paul Lamy, Acting Deputy Director of the ICAO Air Navigation Bureau and co-chair of the Bangkok workshop, who referred
to seven aviation accidents from the last thirty years in which language factors had played a part. A total of 1,459 people died in these accidents.

As well as the Tenerife disaster, the accidents listed at the workshop included the 1996 Charkhi Dadri collision, which occurred when an Ilyushin 76D operated by Kazakhstan Airlines flew into a Saudi Arabian Airlines Boeing 747 that had just taken off from Delhi-Indira Gandhi International Airport. This disaster, in which 349 lives were lost, was the worst mid-air collision in history. While we may never be able to determine exactly what happened, analysis of the flight data recorders led investigators to conclude that the accident resulted from the Kazakh crew misunderstanding an air traffic control communication and descending below their assigned altitude of 15,000 feet, which put them on a collision course with the Saudi Arabian aircraft.

Is English necessary?

Clear communication is obviously essential for the smooth and safe operation of international air transport. The question arises, though, as to whether the communication has to be in English. In other words, is it necessary to make the use of English mandatory for aviation throughout the world? Paul Lamy broached this issue at the ICAO Bangkok workshop by asking, "Do you need to speak English to fly internationally?" He then said, "The short answer is 'No'." He went on to describe instances where other languages could be used, such as hypothetical flights over territories of the former Soviet Union that could be completed with pilots and air traffic controllers speaking Russian. Likewise, pilots could fly international routes in South America using Spanish to communicate with air traffic controllers, and international flights are possible using French in certain parts of Africa or Europe. Such operations are in accordance with Paragraph 5.2.1.2.1 of ICAO Annex 10 Volume II, which states: "The air-ground radiotelephony communications shall be conducted in the language normally used by the station on the ground or in the English language."

Paul Lamy emphasised, however, that the scope of operations is limited for pilots who use Spanish or Russian or any language other than English. You can fly further using English, and you can also fly with more route flexibility since you are not restricted to overlying a series of states where one particular
language is spoken. English is used throughout the world. Indeed Paragraph 5.2.1.2.2 of Annex 10 Volume II states: “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.” Paul Lamy, who is French, summed up the situation by saying: “The fact is that English is the international language of aviation.”

There are certainly people who object to the relentless spread of English, and who do not accept that its dominance is “natural, neutral and beneficial”. (Pennycook 1994:7.) Objectors include both pilots and language instructors. At the Bangkok workshop, for example, Paul Lamy mentioned the case of some older French pilots who had expressed resistance to ICAO’s new English language requirements. Their airline management had responded by saying that resistance to the changes could result in the pilots being reassigned to flying smaller and less prestigious aircraft types.

The reality is that a command of the English language is becoming increasingly important for anyone seeking a career in international air transport. Describing it as “the cross-cultural medium of choice”, McKay and Hornberger (1996:96) have observed that “English has become — or at least is perceived as — indispensable in many areas of international business and for such special purposes as air and sea traffic control.” The ICAO language proficiency requirements are already impacting upon the lives of thousands of people who work in aviation around the world, and many more are bound to be affected in the future. (Millward 2008.) This is an example of language change imposed on a large number of countries by an outside institution. (Graddol 1997:16.) Acknowledging this reality, and accepting the premise that “English is the international language of aviation”, what subsets or varieties of the language do we need to focus on when training students at J. F. Oberlin University?

Radiotelephony phraseology

Two kinds of English feature in air traffic control (ATC) communications: the first is radiotelephony phraseology, and the second is plain English. (Chatham & Thomas 2000:22.) A set of standard radiotelephony, or RT, phraseologies has been developed by ICAO to cover a wide range of routine aircraft opera-
tions. These are periodically modified in response to problems highlighted by accident investigations. The following exchange shows the kind of phraseology used when a pilot receives take-off clearance from a control tower. Note that when requesting permission the pilot does not use the word “take-off”, as this phraseology has been changed since the disaster in Tenerife to reduce possible confusion.

Pilot: Metro Tower, Big Jet 345, approaching holding point C1.
ATC: Big Jet 345, Metro Tower, line up runway 27.
Pilot: Lining up runway 27, Big Jet 345.
ATC: Big Jet 345, runway 27, cleared for take-off.
Pilot: Cleared for take-off, Big Jet 345.

Page 27 of the Manual on the Implementation of ICAO Language Proficiency Requirements states that: “The first principle of good radiotelephony technique is adherence to ICAO standardized phraseologies.” However, it goes on to acknowledge on page 30 that the use of these phraseologies is far from universal. In the US, in particular, alternative phraseologies are commonly used. Kenneth M. Mead, Inspector General of the US Department of Transportation, commented on the use of different phraseologies in a letter sent to Congressman Bob Franks, dated 27th October 2000:

“Standard air traffic control phraseology has been developed by the International Civil Aviation Organization (ICAO), but there are nations, including the United States, which have adopted different phraseology. For example, the ICAO standard phraseology for an aircraft to hold its position is “line up and wait.” However, US air traffic controllers use the phraseology “taxi into position and hold.” This phraseology may not be familiar to foreign pilots arriving at US airports.”

Pilots flying international routes must therefore be familiar not only with the ICAO radiotelephony phraseologies but also, if they enter US airspace, with the FAA phraseologies.
Plain English

The second kind of English featured in air traffic control communications is plain English, or general language. This is more difficult to define as it is those parts of English lexis and grammar that a pilot or controller needs in order to cope with a wide range of non-routine situations that have themselves not been clearly defined. (Mitsutomi & O′Brien 2003:12.) Page 30 of the Manual on the Implementation ICAO Language Proficiency Requirements states that: “Only when standardized phraseology cannot serve an intended transmission, plain language shall be used.” Therefore pilots and air traffic controllers can resort to plain English if they are faced with a situation for which no phraseologies exist. Page 69 of the ICAO manual cites the following example, which has more than half of the dialogue in plain English as the pilot of a light aircraft tries to deal with a landing gear 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.

Emergencies or urgent situations are most often cited as the occasions on which plain language is required. An oft-quoted example occurred on 24th June 1982 when a British Airways Boeing 747 which was en route from Malaysia to Australia lost power in all four engines as it flew through a plume of volcanic ash. There was no standard RT phraseology for this situation. The crew of the British Airways 747 eventually managed to restart the engines at a lower
altitude and make a successful emergency landing in Indonesia on three of the engines. In the meantime, however, a communication breakdown had occurred between the plane and the ground when the first officer tried to notify local air traffic control that all four engines had shut down. His message was misunderstood as meaning that only engine number four had shut down. This illustrates the ease with which miscommunication or misunderstanding can occur, especially in the high-stress environment of an emergency situation.

Not only emergencies but also more mundane situations may fall outside the scope of RT phraseologies and require the use of plain English. In the following example, from page 68 of the ICAO manual, there is no standard phraseology for the pilot’s request for high speed:


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

ATC: For the time, yes.

Professional opinion differs as to how much importance should be placed on plain English. At the Bangkok workshop air traffic controllers from Indonesia and Brunei told me that in their experience the breakdown was 80–90% phraseology versus 10–20% plain English. These figures were echoed by Hiroshi Yasuda, the Director of Education and Training Planning of the ATS Department of the Japanese Civil Aviation Bureau. On the other hand, Ronald Vega Bolanos, Tower Supervisor at Juan Santamaria International Airport in Costa Rica, stated in a plenary session at the 2007 ICAEA Forum that plain English is used more than standard phraseology for air traffic control communications in his region. He said, in other words, that more than 50% of RT communication in the Central American region is in plain English.

The difference in these figures may partly reflect wishful thinking insofar as the main purpose of the Costa Rican supervisor’s presentation was to stress the importance of learning plain English, whereas the Asian controllers were more intent on showing the diligence with which they use ICAO phraseologies. The figures may, however, also reflect real differences in practice resulting from
different national and cultural characteristics, especially between the cultures of Asian countries and North or Central America. Anecdotal evidence suggests that American pilots and air traffic controllers, for example, have a tendency to use a large amount of idiom-rich plain English which can be very difficult to comprehend for pilots who are not native English speakers.

Whatever the breakdown, it is essential that the trainee pilots at J. F. Oberlin University become familiar both with RT phraseologies and plain English. Furthermore, there is an important implication for the classroom: while the RT phraseologies are clearly defined and can be taught and tested in a controlled manner, the plain English requirement is much more loosely defined and the teaching approach will therefore have to be more open.

Conclusions

The ICAO language proficiency requirements came into effect in March 2008, and while some countries are taking advantage of a 3-year transition period to implement changes in training, it is clear that all pilots who fly internationally now have to demonstrate a higher level of English than was the case before. This means that trainees on the Flight Operations Program at J. F. Oberlin University will have to master several aspects of English by the time they become airline pilots. Firstly, they will need to demonstrate language proficiency at ICAO level 4 or higher. Secondly, they will have to master RT phraseologies. Finally, they will need to be able to cope with non-routine flight situations using plain English. The mastery does not have to be achieved during their first three semesters of study, before they head off to Arizona for flight training, but during that period students should develop a foundation of English that prepares them for eventual mastery.

References


ICAO documents


Online resources

Aviation Safety Network. Homepage:
<http://aviation-safety.net/index.php>

1977 Tenerife accident:
<http://aviation-safety.net/database/record.php?id=19770327-0>
<http://aviation-safety.net/database/record.php?id=19770327-1>

1982 British Airways incident:

1996 Charkhi Dadri accident:
<http://aviation-safety.net/database/record.php?id=19961112-0>
<http://aviation-safety.net/database/record.php?id=19961112-1>

Appendix — ICAO language proficiency rating scale

The tables on the following pages show the 6 levels of the ICAO Language Proficiency Rating (LPR) scale, from expert to pre-elementary level. Operational level (= level 4) describes the minimum required proficiency level for radiotelephony communication as of March 5th 2008.
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<tr>
<th>LEVEL</th>
<th>PRONUNCIATION</th>
<th>STRUCTURE</th>
<th>VOCABULARY</th>
<th>FLUENCY</th>
<th>COMPREHENSION</th>
<th>INTERACTIONS</th>
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<td>Expert 6</td>
<td>Pronunciation, stress, rhythm, and intonation, though possibly influenced by the first language or regional variation, almost never interfere with ease of understanding.</td>
<td>Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task.</td>
<td>Vocabulary range and accuracy are sufficient to communicate effectively on a wide unfamiliar topics. Vocabulary is idiomatic, nuanced, and sensitive to register.</td>
<td>Able to speak at length are natural, effortless flow. Varies speech flow for stylistic effect, e.g. to emphasize a point. Uses appropriate discourse makers and connectors spontaneously.</td>
<td>Comprehension is consistently accurate in nearly all contexts and includes comprehension of linguistic and cultural subtleties.</td>
<td>Interacts with ease in nearly all situations. Is sensitive to verbal and non-verbal cues and responds to them appropriately.</td>
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<td>Extended 5</td>
<td>Pronunciation, stress, rhythm, and intonation, though possibly influenced by the first language or regional variation, rarely interfere with ease of understanding.</td>
<td>Basic grammatical structures and sentence patterns are consistently well controlled. Complex structures are attempted but with errors which sometimes interfere with meaning.</td>
<td>Vocabulary range and accuracy are sufficient to communicate effectively on common, concrete, and work-related topics. Paraphrases consistently and successfully. Vocabulary is sometimes idiomatic.</td>
<td>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 makers or connectors.</td>
<td>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.</td>
<td>Responses are immediate, appropriate, and informative. Manages the speaker/listener relationship effectively.</td>
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<tr>
<td>LEVEL</td>
<td>PRONUNCIATION</td>
<td>STRUCTURE relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task.</td>
<td>VOCABULARY</td>
<td>FLUENCY</td>
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<td>Operational 4</td>
<td>Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation but sometimes interfere with ease of understanding.</td>
<td>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.</td>
<td>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.</td>
<td>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 makers or connectors. Fillers are not distracting.</td>
<td>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.</td>
<td>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.</td>
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<tr>
<td>Pre-operational 3</td>
<td>Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation and frequently interfere with ease of understanding.</td>
<td>Basic grammatical structures and sentence patterns associated with predictable situations are not always well controlled. Errors frequently interfere with meaning.</td>
<td>Vocabulary range and accuracy are of accuracy are often sufficient to communicate on common, concrete, or work-related topics, but range is limited and the word choice often appropriate. Is often unable to paraphrase successfully when checking vocabulary.</td>
<td>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.</td>
<td>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.</td>
<td>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.</td>
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<td>LEVEL</td>
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<tr>
<td>Elementary 2</td>
<td>Pronunciation, stress, rhythm, and intonation are heavily influenced by the first language or regional variation and usually interfere with ease of understanding.</td>
<td>Shows only limited control of a few simple memorized grammatical structures and sentence patterns.</td>
<td>Limited vocabulary range consisting only of isolated word and memorized phrases.</td>
<td>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.</td>
<td>Comprehension is limited to isolated, memorized phrases when they are carefully and slowly articulated.</td>
<td>Response time is slow and often inappropriate. Interaction is limited to simple routine exchanges.</td>
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<td>Pre-elementary 1</td>
<td>Performs at a level below the Elementary level.</td>
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