EMBRY-RIDDLE
Aeronautical University™
SCHOLARLY COMMONS

International Civil Aviation English Association   ICAEA Workshop 2018, Building on the ICAO LPRs – Communication as a Human Factor

May 10th, 10:55 AM - 11:55 AM

What Should We Teach Native English Speakers?

Dominique Estival
MARCS Institute, Western Sydney University, Australia

Follow this and additional works at: https://commons.erau.edu/icaea-workshop

What should we teach Native English Speakers?
Workshop at 2018 ICAEA Conference, Daytona Beach, Florida, USA
Dominique Estival
MARCS Institute, Western Sydney University, Australia

1. Introduction

While non-native English speakers (EL2) aviation professionals must attain ICAO ELP Level 4 and are tested for the comprehension of a variety of accents, native English speakers (NES) are not. This paper reports on the outcomes of a workshop held at the 2018 ICAEA Conference, titled "What should we teach Native English Speakers?". Groups of Aviation English teachers, Air Traffic Controllers, pilots and representatives of aviation regulators explored the different ways in which NES and EL2 student pilots approach Aviation English and learn to communicate while learning to fly. The aims of the workshop were to foster a discussion of the ways participants may have already prepared NES to deal with EL2 pilots or ATC, and to elicit suggestions of what could or should be included in a syllabus for NES, with the aim of raising their awareness of the difficulties faced by EL2s and of ways to alleviate those.

The starting point was a presentation of the ICAO guidelines for Native English Speakers (ICAO, 2010), with specific questions about what they mean in practice. A participant worksheet (see Appendix) was then used to guide group discussions and to collect suggestions. The discussion focussed on specific approaches to prepare NES pilots and ATCs to not only master radiotelephony phraseology in their production, but also how to understand EL2 pilots and ATCs. Fifteen (15) groups of 2-5 people returned the worksheet after group discussion of the questions during the two workshop sessions. Section 4 presents a summary and an analysis of those answers, with a discussion of the suggestions proposed by the workshop participants. Unsurprisingly, there was agreement that training for NES pilots should include comprehension of a variety of accents and an understanding of the difficulties EL2 pilots may experience, confirming findings and recommendations made recently by Clark (2017) and Borowska (2017).

2. Background

Our research on Aviation Communication (Estival, Farris, & Molesworth, 2016; Jang, Molesworth, Burgess, & Estival, 2014; Molesworth & Estival, 2015; Wu, Molesworth, & Estival, 2018) explores the types of errors made by pilots under different conditions. In particular, our experiments in a flight simulator (Australian General Aviation pilots) and our later analysis of LiveATC data (Commercial Aviation) show different behaviours by NES and EL2 pilots at different stages of their training. Overall NES pilots made fewer communication errors than EL2 pilots but the EL2/NES distinction was confounded by other factors.

In the flight simulator experiments (Estival et al., 2016; Molesworth & Estival, 2015), there was no difference between EL2 and NES pilots under conditions of higher information density and greater pilot workload, while faster ATC speech rate proved significant only for low qualified (i.e. PPL or less) pilots: not only did higher ATC speech rate have a significant impact only on low qualified EL2 pilots, but the type of error varied significantly between low qualified EL2 and NES pilots. Low qualified NES pilots made more mistakes than

omissions (they need to be taught to think before speaking), while low qualified EL2 pilots made more omissions than mistakes (they need to be encouraged to speak). There was no significant impact of ATC speech rate for high qualified (CPL or higher) pilots, nor a significant difference on the type of error they made, showing that with higher qualification and more training, both groups perform equally well (with an accompanying decrease in mistakes for NES pilots and a comparative apparent increase in mistakes for EL2 pilots).

In the LiveATC data we analysed for Sydney Approach and Departures (Wu et al., 2018) we observed a significant impact of higher information density on the number of errors made by accented pilots, and a difference in the type and category of errors made by native English sounding versus accented pilots. For the type of errors, there were omissions in the readbacks of both native English sounding and accented pilots, but mistakes only in the readbacks of accented pilots. For the category of error, while there were more errors with words for accented than native English sounding pilots, there was no difference for errors with numbers.

Discussion about Aviation English is more often centred on the need to teach English to non-English speakers and on the most efficient ways to do so [REFS], but the non-compliance of Native English Speakers with the phraseology is arguably as much a problem for international aviation communication as the difficulties that non-native speakers of English may have. For instance, Clark (2017) identified particular issues with the way NES produce radio transmissions: deviation from standard phraseology and not adhering to ICAO number pronunciation. She proposed several recommendations, as given in Table 1.

Table 1. Recommendations for NES (Clark, 2017:32)

• Native English speakers should think of English in the flight deck or over the radio as not English as they know it, but instead as a different 'language'.
• On-going language awareness training should be implemented.
• Language awareness training should emphasise the elimination of local slang and non-standard phraseology.
• Language awareness training should incorporate awareness of non-native English listeners in training.

These recommendations echo and reinforce the guidelines provided by the International Civil Aviation Organization in Doc 9835 (ICAO, 2010).

3. The ICAO guidelines for Native English Speakers

ICAO has long identified as a potential problem for aviation communication the fact that, given the use of English as the international language of aviation, Native English Speakers not only have a perceived advantage over speakers from other linguistic backgrounds but may also have a different approach to aeronautical communication, taking it as licence to use conversational English instead when it is not appropriate. For that reason, ICAO provides specific recommendations and guidelines for NES (ICAO, 2010). More specifically, ICAO (2010) recommends: a) that NES production must be intelligible (see Table 2), and b) that NES must be aware of potential difficulties for EL2 (see Table 3)

Table 2. NES production must be intelligible (ICAO, Doc 9835)

3.3.3 […] users with high proficiency must *accommodate their use of language* so as to remain intelligible and *supportive to less proficient* users.
4.5.3 […] e) Proficient speakers shall use a dialect or accent which is *intelligible to the aeronautical community*.

Table 3. NES must be aware of potential difficulties for EL2 (ICAO, Doc 9835)

4.5.10 […] native speech should not be privileged in a global context.
5.3.2.1 […] the burden for improved communications should not be seen as falling solely on non-native speakers.
5.3.1.3 […] Native speakers of English, in particular, have an ethical obligation to *increase their linguistic awareness* and to take special care in the delivery of messages.

We can say anecdotally that in countries where English is the official language, even senior flight instructors are rarely aware of these recommendations. In Australia, where there is testing of ELP for NES for comprehension of other English accents, awareness of the speaker's own linguistics characteristics is not emphasized. Meanwhile there is no training or testing of NES pilots for ELP in the US.

ICAO (2010) also spells out specific strategies for NES for better cross-cultural communications, as shown in Table 4.

Table 4. Strategies for better cross-cultural communications (ICAO, Doc 9835)

5.3.1.4 […] b) native and other expert users of English can acquire *strategies to improve cross-cultural communications*;
5.3.1.4 […] 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*; and
5.3.1.4 […] 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.
5.3.3.2 In this context, native speakers aware of the challenges faced by speakers of English as a foreign language (EFL) 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. They can also attend more carefully to readbacks in cross-cultural communication situations, *taking greater care to avoid the pitfalls of expectancy*, where a pilot or controller expecting a given result unconsciously affects the outcome. 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.

| 5.3.3.7 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*. |
| 5.3.5.2 […] While communication errors will probably never completely go away, disciplined use of ICAO standardized 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. |

The question is whether this in fact happens and whether NES are even made aware of these obligations. The discussions during the workshop at ICAEA 2018, and the answers provided by the workshop participants on the worksheet (see Appendix 1) demonstrate that this is not the case.

4. Answers from the workshop participants

In total, 15 worksheets were returned at the end of the workshop. Most groups spent more time discussing the first question, and some did not answer any of the other questions. In the tables given below, the number of answers returned for each question is given in brackets. The full answers to all the questions can be found in the online document where they were entered by the author after collating the paper worksheets[1]. As the answers to Question 1 and Question 2 were very detailed, Table 5 and 6 provide summaries as well as the breakdown of answers for those questions.

Table 5. Q1. What do you think are the most important requirements[2] for NES regarding communication between NES and EL2 in the aviation context? [15/15]

Summary of answers to Q1	
Strategies for accommodation [8], e.g. simplification [14], speech rate [11], accent [6], paraphrase [3], cross-cultural strategies [3]	44
Awareness of the need to adapt in the international environment	10
Stick to the Standards, Procedures and to Standard Phraseology	7
Attitude: professionalism and patience	4
Training of instructors; Testing; Reviews	4

Breakdown of answers to Q1	
Rate of speech/speak slowly/pace	11
Accommodate/accommodation strategies	8
Stick to the standard. Doc 4444 (ICAO, 2016b), ch.12	6
Keep to essential words/simplify vocabulary	6

---

[1] https://docs.google.com/document/d/1cTWn0Iyj0LJpMdeSzCBRUjOFOuBGyNfbEqrDaqLPCWM

[2] The worksheet referred to 'requirements'. Elizabeth Matthews pointed out that strictly speaking, ICAO Doc 9835 (ICAO, 2010) does not give 'requirements' but recommendations and guidance. Only what is in the Annexes is required – and only from the States that have signed.

Simplify language	6
Accent intelligibility for international community/tone down (NES) accent	5
Cross-cultural strategies (40% pilots from Asia)	3
NES need more awareness of culturally-specific and figurative language / sensitivity to culture	3
Awareness of colloquial vs International phrases/words	3
Paraphrase more simply ('sideways')	2
Awareness of the need to adapt to EL2 / adapt fluency, rate of speech, rhythm	2
"authority" attitude towards EL2	1
Know how to paraphrase if EL2 can't understand	1
Empathy + care	1
Study the procedures where flying (PPs)	1
KISS	1
Exposed to different accents	1
Clarity	1
Enforce re-testing	1
Organising shift meetings as a review of ATC general performance	1
Commonalities across NES countries	1
Attitude (integrity, professionalism)	1
Good 'training the trainer'	1
Experienced instructors mentoring young instructors	1
Patience w/training EL2	1

For Question 2, which asked for instances of communication between NES and EL2, participants were more interested in giving examples of communication failures than examples of successes, with only 2 example of success: one involving the reverse image of the main causes of failure, i.e. good use of standard RT, and one showing the creativity of EL2 when their English vocabulary is failing.

Table 6. Q2. Examples of NES interacting with EL2: failures and successes [14/15]

Q2.a. Main causes of failures [14/15]	
Summary of answers to Q2.a	
Lack of training in phraseology for NES, deviations from standard phraseology (e.g. "follow the greens"; "twelve ninety five")	6
Use of slang/jargon/colloquialisms/idioms (e.g. "kill the rabbit")	5
Attitude: lack of sympathy, lack of patience, culture of superiority towards EL2, non-supportive behaviour, arrogance	4
No exposure to different cultures, lack of awareness of cultural issues	2
Non-compliance with standards, non-compliance with rules	2
NES speech too fast	2
Too much information in the same message (more than 3 pieces); sometimes irrelevant information	1
Rote learning/checklists	1

Q2.b. Successes [2/15]	
Standard RT + Confirm, Clarify, Check	1
Innovative creation in unusual situation: "the earth going up and down" to express "earthquake"	1

The answers to Question3, about whether and how NES are taught how to deal with EL2, demonstrate not only the lack of such training, but the perception of the need to provide explicit instruction to NES.

Table 7. Q3. Teaching those requirements to NES - In your own experience: [10/15]

Q3.a. Are they taught? [10/15]	
No	9
Yes	0
Sometimes	1

Q3. b. Which ones? (e.g. being intelligible, being aware of difficulties for EL2) [2/15]	
Given scripts of previous situation. Being aware of difficulties	1
not taught routinely	1

Q3.c. Where are they taught, and by whom? [5/15]	
They should be taught by instructors that are prepared for that and aware of its importance (most likely NNS, experienced pilots or instructors)	1
in cockpit	1
App being developed Beta stage software for self-study (Ohio University) – PlaneEnglish	1
English Language Specialist (Case Study, Test, Role Play)	1
not happening yet	1

Q3. d. How are they taught? (e.g. explicitly, by example, by correction, by rule) [2/15]	
Explicitly. Role Play	1
maybe… CAP-413 for British radiotelephony is an example to teach British pilots & ATCOs to stick to standards	1

The answers to Question 4, about how NES should be taught, were very detailed and are given in full in Table 4.

Table 9. Q4. How should the ICAO requirements for NES be taught? [11/15]

Standard Phraseology classes for NES, which should include: teaching accommodation skills by analysing samples of real life R/T communications, with breakdowns, with NES and NNES.
NES could be exposed to a variety of accents and there could be some tasks in which they had to understand and role play interactions with NNES.
They should be taught how to be aware, communication strategies.
Case studies

Native English speakers could start to learn other languages so they better understand the challenges
Listen to themselves
Clean up speech (Hesitations)
Teach on the ground first (vocabulary), then intersperse with flight training
Phraseology should be re-tested: - Level 4 every 3 years - Level 6 every 6 years
Textbooks based on ICAO for Pilots and ATCs
For ATC: classroom theory; online qualification
Phraseology refresher course
Phraseology testing as part of ground school
Workshop to raise awareness on limiting NES use of idiomatic and figurative in plain language interaction.
Simulator: Competency checks should involve a language element
CRM/TRM should include language as an element of training
For written manuals: expose authors to learning situation of readers/ mechanics
When doing line checks pilots should be evaluated. ICAO requirements should be added to line check
Built into training - initial and recurrent
Video, on line learning
Role-playing and open-ended scenarios
NES should be held accountable
Regulation
Initial training + recurrent training
Part of checklist on which you are assessed.
Case studies of risky situations
Role-play: on a sim position - Switch pilot-controller - Pilot-controller synergy training
Impossible to enforce unless it is regulated → All aviation authorities must impose RT training (refresher) and testing
It should be a requirement
Something like a short course like Dangerous Goods or Aviation Safety. Once per 2 years.

The answers to Q5 mostly repeat those of Q.4 and confirm the need for explicit training, and testing of NES. The current recommendations would ensure adequate training if they were observed and put into practice.

Table 9. Q5. Should there be other requirements for NES in addition to those in ICAO Doc 9835? [5/15]

Q5.b. If so, what are they? [5/15]
NES shouldn't be automatically rated level 6 but they should undergo testing in Aviation English and Standard Phraseology, in which they would have to prove their

ability to apply accommodation skills. If there are reports for communication problems, they should be re-tested.
It should be included in the testing policy (NES should be tested).
Training could also be a requirement (mandatory training)
Should be tested (S.P. for NES)
Incorporated as other task?
Level 6 never gets retesting. Recommend recurrent testing for level 6.
If the ones in 9835 now were adhered to, probably no need for more!
And these requirements should appear in the documents that pilots/controller read: - Manual of RTF (Doc 9432, 2007) (ICAO, 2007) - FAA Pilot/Controller Glossary AIM (FAA, 2018) - Doc 4444 (ICAO, 2016b) - Annex 10, vol II (ICAO, 2016a)

Q5.b **And how should they be taught [1/15]**
See answer 4

Conclusion

It is clear from the answers given by the workshop participants and shown in Tables 5-9 above that there is a strong feeling – at least among the workshop participants – that:
- NES should be taught Standard Phraseology
- NES should be tested regularly
- The recommendations in (ICAO, 2010) should be made mandatory
- Training for NES as well as for EL2 and NES would benefit from case studies and role-playing

Currently, Aviation English is not taught nor tested in the US, which is a serious issue for the rest of the world, where it is not only taught but tested as part of pilot and ATC licencing. This, there is compliance with the LPRs around the world, but not in the US.

Incorrect phraseology and miscommunications are not just an issue of safety, they are also a problem for efficiency of operations, causing delays, adding to costs (for the airlines) and inconvenience (for the passengers). Unsuccessful communication requiring repetitions and clarifications can also prevent distress messages from being heard, causing accidents/incidents that are not directly traceable to miscommunication (see also (Matthews, 2018)).

References

Borowska, Anna (2017). *Avialinguistics: The study of language for aviation purposes*. Frankfurt am Main: Peter Lang.

Clark, Barbara. (2017). *Aviation English Research Project: Data analysis findings and best practice recommendations*. Retrieved from https://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=7802

Estival, Dominique, Farris, Candace, & Molesworth, Brett R.C. (2016). *Aviation English: A lingua franca for pilots and air traffic controllers*. London, UK: Routledge.

FAA. (2018). *FAA Pilot/Controller Glossary AIM*. Retrieved from https://www.faa.gov/air_traffic/publications/media/pcg_basic_chgs%201_2_9-13-18.pdf.

ICAO. (2007). *ICAO Doc 9432. Manual of Radiotelephony, Fourth Edition*. Montreal, Canada: International Civil Aviation Organization.

ICAO. (2010). *ICAO Doc 9835. Manual on the Implementation of ICAO Language Proficiency Requirements, 2nd Edition*. Chicago, USA: International Civil Aviation Organization.

ICAO. (2016a). *Annex 10 to the Convention on International Civil Aviation: International Standards and Recommended Practices and Procedures for Air Navigation Services, 7th edition.* Montreal, Canada: International Civil Aviation Organization.

ICAO. (2016b). *ICAO Doc 444. PANS-ATM, or Procedures for Navigation Services – Air Traffic Management)* Montreal, Canada: International Civil Aviation Organization.

Jang, Raymond, Molesworth, Brett R. C., Burgess, Marion, & Estival, Dominique. (2014). Improving Communication in General Aviation through the use of Noise Cancelling Headphones. *Safety Science, 62*, 499-504.

Matthews, Elizabeth. (2018). *A linguistic review of aviation accidents*. Paper presented at the International Civil Aviation English Association 2018, Daytona Beach, FL, USA.

Molesworth, Brett R. C., & Estival, Dominique. (2015). Miscommunication in general aviation: The influence of external factors on communication errors. *Safety Science, 73*, 73-79.

Wu, Qiong, Molesworth, Brett R.C., & Estival, Dominique. (2018). *Investigating miscommunication in commercial aviation between pilots and air traffic controllers*. Paper presented at the 13th International Symposium of the Australian Aviation Psychology Association, Sydney, Australia.