

# Language Proficiency in Aviation

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### 1. Language and Human Factors

We all use language and language tends to be something we take for granted.

In point of fact, language is probably one of the most complex and also the most fundamental skills any of us has to master. It is a skill which engages not just our intellect but our personality, our emotions and our relation to the world.

It could be said that language is at the heart of what defines us as human beings and affects our performance in every single activity we undertake. Yet our own memories of language learning are often lost in the mists of childhood.

Paradoxically, the fact that language is everywhere and yet transparent explains in part why its use and acquisition have often been treated as negligible quantities in the operational and training worlds.

In recent years, however, two phenomena have converged to cause greater interest in and awareness of language use and learning:

- on the one hand, the rapidly growing needs for communication generated by the global economy have highlighted the shortcomings of much conventional school language teaching in catering for the practical demands of the professional world;
- on the other, the development of human factors studies over the last two decades and their spread from flight deck to hangar have led to a growing awareness of the vital part played by communication and live-ware generally in the safe and efficient execution of any process.

Whether, from an academic point of view, we consider that the use of language is part of the human factors package or not, language skills undoubtedly underlie and affect as a common tool many features of human factors concerns such as:

- ease of communication within a team,
- Efficiency of the training process,

- the use of technical documentation and computers,
- individual self-confidence, curiosity, accuracy and speed of reaction,
- and, more generally, situational awareness.

In the flight crew sector, that tends to drive the industry, there is now widespread and well documented recognition that linguistic misunderstandings and incomprehension have been contributory factors in several major accidents. The first officer's remark "We are at take-off" at Tenerife in 1977 is only the most sadly celebrated of these.

It is however a chilling reminder of how much can potentially hinge on a single common word. Turning to the maintenance arena, where fortunately the time factor is not so critical, similar snares come to mind:

- "The OFF legend comes on" or
- "The top horizontal outboard-flange lower-surface"

where even the application of the principles of Simplified English to Aircraft Maintenance Manuals has not meant that aircraft technicians no longer have reason to be puzzled at times, especially when they are not native speakers of English.

## 2. Requirements

So, in the last few years, the Authorities have sought to address the question of proficiency in the language which is the official *lingua franca* of aviation, English, in the main aviation professions.

- In 1994 the FAA initiated a process leading to an Advanced Notice of Proposed Rulemaking relating to an Operator Flight Attendant English Language Program which received the support of the pilots and cabin crew associations although its recommendations were finally approved and incorporated into new training requirements. ([www.faa.gov/avr/arm/0502oper.htm](http://www.faa.gov/avr/arm/0502oper.htm))
- Advisory circular 60-28 was issued by the FAA Flight Standards Service in 1997 to define the English language skills required by airmen, mechanics and dispatchers. Some rule-of-thumb guidelines as to how this 'fluency' was to be assessed were provided and the responsibility rested with the instructor who could refer to an aviation safety inspector in case of doubt. (<http://av-info.faa.gov/data/advisorycircular/ac60-28.pdf>.)
- Also in 1997, the Air Navigation Commission of ICAO set the task which subsequently led to the creation of the Proficiency Requirements in Common English Study Group. Their recommendations to render an operational level of English proficiency a requirement, rather than a recommended practice, for all pilots and air traffic controllers on international routes were approved by the ICAO Council in March 2003 for implementation in all member states by January 1<sup>st</sup> 2008. ([www.icao.org](http://www.icao.org))
- Meanwhile, on both sides of the Atlantic, the FAA and JAA (now EASA) were regulating language standards to be met by both certifying staff (Part 66-15 (b)), approved maintenance organisations (Part 145-35 (e)) and maintenance training organisations (Part 147). For instance, ECAR 66 quotes IEM 66.15 (b):

1. ‘Certifying staff should have a general knowledge of the language used within the JAR-145 approved maintenance organisation including knowledge of common aeronautical terms in the language. The level of knowledge should be such that the applicant is able to:
  - Read and understand the instructions and technical manuals in use within the organisation;
  - Make written technical entries and any maintenance documentation entries, which can be understood by those with whom they are normally required to communicate;
  - Read and understand the company procedures;
  - Communicate at such a level as to prevent any misunderstanding when exercising the privileges of their authorisation.

In all cases, the level of understanding needs to be compatible with the level of certification authorisation granted.’ ([www.easa.eu.int](http://www.easa.eu.int))

### 3. The Working Environment

The Aircraft Maintenance Technician of 2004 works in a radically different environment from his forebear, the “mechanic”, of twenty years ago.

Aircraft design and maintenance practice have changed substantially in the last two decades:

- a computer interface, which speaks English and is the nucleus of centralized maintenance, has become the alpha and omega of a working shift. It would be trite and unfair, however, to say the pen has replaced the wrench, but there is an element of truth in this.
- new regulations, standards and release procedures have introduced new constraints for technicians.
- technical documentation is also computer-based, generating new more discursive and synthetic reading habits, although it has in no way resulted in a paper-free environment. In non-English speaking countries, translation is fast becoming a thing of the past for economic, commercial, reactivity and safety reasons.
- As regards documentation, eighteen years down the road, AECMA Simplified English has become accepted as the industry norm creating a few problems but attenuating many more. In its wake, the documentary styles of the various manufacturers’ documentation have tended to converge. Research sponsored by the FAA and published this year has revealed in a comparative study that the use of Simplified English has reduced the error rate in reading comprehension among technicians from 18% to 14% for native English speakers and from 31% to 13% for non-native speakers. Perhaps that also says something about native speakers of English! (<http://hfskyway.faa.gov>)
- the recent regulatory environment imposed by civil aviation authorities world wide which defines the standards to which technicians are trained and work and delineates

the process of release to service has brought with it increased paperwork as has the concern for part traceability.

- standardisation and the need for savings have steered most airlines away from in-house training development and towards the use of manufacturer courseware ... again in English.
- finally, the global economy and hard times have spurred the airlines towards various forms of co-operation, alliance, load sharing and partnership. National boundaries have less and less significance. Simultaneously, the maintenance workforce is increasingly mobile, multicultural and cosmopolitan. Sociological and personal reasons only reinforce the professional need for a common language both in the hangar and at the ramp.

As you can see, all these trends have something “invisible” in common: a much increased reliance upon language and upon a single language, English.

Before we close this chapter, I should like to refer you to some very thorough and illuminating research being conducted since 2001 by C.G. Drury at New York State University, Buffalo, under the auspices of Dr. William Krebs of the William J. Hughes Technical Center of the FAA. This study addresses the question of Language error in Aviation Maintenance. It is in response to an FAA concern that non-native English speakers in repair stations in the USA and abroad may be prone to an increased error rate that could potentially affect airworthiness. Research has largely been based on comparative studies conducted in American and Chinese repair stations.

Interim reports and an excellent abstract of the research to date can be obtained from the web site: <http://www.hf.faa.gov/maintfund.htm>.

Findings will be submitted in a paper at the Human Factors and Ergonomics Symposium in New Orleans in October 2004.

Various strategies, that could be termed ‘survival tactics’ in some cases, to cope with insufficient English language skills and work towards greater proficiency, are described in the interim reports ..... which naturally leads us to our next chapter.

#### **4. The Learning Environment**

Working towards greater appropriate linguistic proficiency takes place in two distinct learning environments.

The first, less cluttered, heterogeneous and interrupted by the outside world, is that of the technical college training ab initio young people to become qualified AMTs. In this environment, the main concerns are hiring and training qualified teaching staff, complying with Part 147 requirements, designing a syllabus and selecting suitable courseware. The constraints are those of any academic establishment.

It is quite another kettle of fish, the situation is quite different, in the world of the airlines and repair stations. The issues that face a technical college also have to be addressed in the operational world but, in addition, there are many other complicating factors which mean that technical English training is not good news for training managers and foremen.

- The populations are heterogeneous in terms of age and initial linguistic ability
- They have specific needs as regards subject matter; a systems mechanic and a structural specialist do not use the same documents, have the same basic training or need the same terminology.
- MRO work loads, hence availability, fluctuate constantly.
- Most workers work shifts so training scheduling is a headache.
- Many technicians do not use English outside the work place so that familiarity with the language is not sustained naturally.
- Language testing may be perceived as a threat to their careers or as reflecting badly on their professional ability.
- Much general English teaching may be long, costly and inefficient.
- For management, the recent requirements (Parts 66 and 145) have already placed a considerable burden on training time and budgets.
- For the staff, the fallout from these same requirements and the rapid changes in both their technical and professional environment have already meant that they have had to learn and adjust to much that was new. Having to swallow English might just be the last straw!

It may look as if we have let all the misfortunes of the World out of this Pandora's box by mentioning English. There is, though, a ray of hope that should not be underestimated: on the whole, aircraft mechanics are good and imaginative learners and curious, committed professionals. And with that a lot can be done.

So, where do we go from there?

## **5. The Way Forward**

As you know, there are no magical solutions and language acquisition is a slow and ongoing process. However, as with any training objective, there are a few factors that are critical in giving oneself the best chance of success.

- Appropriately qualified language professionals with significant aviation experience need to be employed.
- Time must be taken to design an appropriate assessment and learning system, not just the setting up of courses. This requires the language professionals to be included in a team that brings together human resources, training and local management. No system will work if it does not grow out of the working environment.
- The staff should be seen as being taught to perform tasks in English rather than as being taught the English language. This is both more motivating and more cost

effective. Objectives are more realistic and assessable if they are expressed in operational rather than linguistic terms.

- Specific and engaging courseware should be selected for both teacher-led and guided self-access learning. (The operative word here is 'guided'!)
- Most companies would be surprised by the talent sleeping amongst their staff. The use of facilitators to act as a complement to the language teachers, ensures continuity and brings language learning to the hangar floor.
- Learners require to be monitored, not just administratively as bums on seats but also pedagogically, for their learning to be effective.
- Good communication about objectives and ground rules to learners and their management provides everyone with a shared visibility which is a prerequisite for involvement.
- A combination of various media (classroom, resource centers, CBT, distance learning and OJT) and actors (English for Specific Purposes language teachers, technical facilitators) can create synergy and foster a learning continuum that may well reduce classroom time while increasing its effectiveness.
- Learning, especially learning a language, is an ongoing process. The tools now exist for this to blend into the everyday working environment.

To conclude these thoughts on English language proficiency that I have just shared with you briefly, let me say that to my mind something is underlying them all. Language proficiency is not just a question of understanding or not understanding information. It circumscribes the whole way people are able to behave because it affects their self-confidence, their awareness of the world around them and the scope of their capacity to report this to others.

More information may be found at:

[www.bwise2.com](http://www.bwise2.com)

ICAEA, the International Civil Aviation English Association, has its web site at:

[www.icaea.pata.pl](http://www.icaea.pata.pl)