PROFESSIONAL EDUCATION

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RATIONALE FOR LINGUISTIC PROFILE OF AVIATION ENGLISH LANGUAGE TRAINING COURSE

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Abstract. *The article deals with a new look at learning Aviation English to effectively conduct 'from air-to-ground' communication. The communication is based on both radiotelephony phraseology and plain English. The results of aviation oral discourse analysis linguistic profile research are presented in the article. The ratio of phraseology and plain English use identifies the twofold nature of the communication which should be taken into account while developing an English language training course for aviation personnel according to ICAO language requirements.*

Keywords: air traffic controller; aviation safety; flight crew; professional language competence; radiotelephony communication; spoken aviation english; standard ICAO phraseology.

1. Introduction

The civil aviation safety is often determined by human factors due to the fact that most of the emergency events are caused by a human error. Among others, the English language is becoming one of the main contributors to aviation accidents. Therefore the human error language related should be minimized. This is possible by research of linguistic profile of radiotelephony communication between an air traffic controller and a flight crew.

The radiotelephony communication is conducted during all flight stages and normally by using of standard radiotelephony English phraseology. In non-routine situations special phraseology is used (e.g., distress calls). But often the phraseology is not sufficient to achieve the communication intention. It can be caused by many reasons though not always by technical factors. Especially under stress due to emergency or urgency the communicators will require much more language to interact in cooperative manner.

The International Civil Aviation Organization (ICAO) new English language requirements suggest usage of plain English when radiotelephony phraseology is not enough to communicate successfully.

This twofold nature of radiotelephony communication can't be overestimated. It must be incorporated into an English language training program for air traffic controllers and members of flight crews.

At the moment, there is a society request for training the aviation personnel according to standards of ICAO to operate on international routes. In order to increase flight safety ICAO initiated implementation of the new language proficiency requirements for air traffic controllers and pilots of non-English speaking countries (Doc 9835).

Analysis of language communication during aviation accidents and incidents reveals the fact that the communicators being under stressful situation switch off phraseology and use plain English to manage the situation. Therefore they need to be trained to manage interaction by switching off/on between standard phraseology and plain English. While standard phraseology is prescribed and regulated, plain English is used spontaneously and may vary greatly from one person to another.

In our research we tried to find specific features of radiotelephony interaction between an air traffic controller and flight crew in the light of the twofold nature of communication in non- standard emergency situations.

2. Analysis of research and publications

Analysis of publications shows that the Ukrainian authors addressed the problem of professional training for the radio exchange (I. B. Faynman, Y. V. Kmita, V. V. Piven, T. V. Tarnavskaya). For example, I. B. Faynman highlights the essence of the

preparation of future air traffic controllers to the radio exchange as a component of their general professional training [1].

Research of Y. V. Kmita addresses the impact of foreign competence of air traffic controllers on flight safety. It presents the analysis of this competence, the ratio of its elements, peculiarities of professional activities of air traffic controllers in the context ICAO requirements to level 4 of working language proficiency of aviation specialists [2].

V. V. Piven considers training pilots for radio exchange on international air routes, but does not uncover problems of air traffic control in situations where using of standard phraseology is not provided for [3]. Author T. V. Tarnavskaya analyzed the issue of preparation for radio exchange from perspective of the foreign language communicative competence of aviation specialists [4].

H. S. Pashchenko points out that the English radio exchange by pilots with the air traffic control centre is the basis of flights in international air routes. In extreme conditions of a flight, the radio exchange is superimposed on the complexity of the direct control over the aircraft, adds stress and threatens adverse consequences. Over the past 15-20 years, from 60 % to 65 % of prerequisites for aviation incidents and accidents occurred due to low level of professional knowledge, skills, and command of English language. Theses human related factors are becoming crucial in extreme conditions and when time to assess the flight situation and making a decision is limited [5].

3. Purpose of work

The purpose of the article is to present results of research aimed at analysis of linguistic profile of radio telephony authentic exchange between the air traffic controller and the crew.

The study was based on a sample survey method. The materials were 37 authentic episodes selected according to the criteria of being related to various non-standard situations which encouraged air traffic controllers and crew members to switch on plain English.

It is clear that the radio exchange in civil aviation is an act of verbal interaction, exchange of professional information between the plane crew and ground control services or other aircrafts, which is performed using high-quality communications channels. This communication is conducted in real world circumstances in the air traffic control area, which are depicted in graphical and audio-visual forms on the screens of instruments and control panels [6].

It should be noted that the controller's position in the hierarchical relationships of radiotelephony communicators is higher than the position of the crew, and the communications is based on vertical relationships [6].

The flight safety depends directly on the quality of verbal interaction of aircraft personnel and air traffic controllers. That is why the International Civil Aviation Organization (ICAO) pays special attention to the issues of communication in aviation. For example, the new requirements on language proficiency level were set forth in the legal and regulatory documents of ICAO concerning the English language [7].

The procedure for using the English language in radiotelephony communications is regulated by Standard and Recommended Practices (SARPS) and the Procedures for Air Navigation Services (PANS), which are found in Annex 10 "Aeronautical Telecommunications" and PANS-ATM. Specific requirements for command of the English language as set out in Annex 1 "Issuing Certificates to Aviation Personnel" In addition, ICAO phraseology is published in Volume II "Rules of communication, including rules that have PANS status" [8].

Therefore, we will consider these requirements. ICAO document "Procedures for Air Navigation Services" defines radiotelephony rules using the standard phraseology on international air routes [9].

Analysis of ICAO document 9835 shows that the standard phraseology is a linguistic phenomenon, which is a set of different operating rules. The main linguistic characteristics are the following: limited vocabulary (about 400 words), in which each word has a precise meaning, often limited to the aviation sphere, and short sentences as a result of non-using such auxiliary language units as articles, possessive pronouns, verbs and link verbs "is/are", personal pronouns "I, you, we", and prepositions) [10].

Authentic episodes were analyzed according to the method of sample survey. This method revealed the following results in the table №1 below.

The analysis of the episodes showed that plain English increases up to nearly 19 % of the total number of words used by radiotelephony participants. Therefore phraseology was used in 80 % of interaction. The fact proves that the phraseology is substituted in a proportion of 1 plain English unit to 5 phraseology units. Total 23010 (100 %) lexis have been studied where there were 18660 (81,1 %) phraseology and 4350 (18,9 %) plain English units.

Table 1. Percentage of plain English and standard phraseology in the radiotelephony communication

	Lexical items total	Plain English	Standard phraseology
Value	23010	4350	18660
Percentage %	100	18,9	81,1

Let us consider the example of texts of non-standard situations during the radiotelephony communications:

1) *C: AB nine four six PAPA, report the reason please*

P: We have smoke in cockpit, but we have no fire, light indication now

C: Do you need fire brigade?

2) *C: X DELTA X, stand by*

C: X DELTA X, do you need position another apron?

P: Yes, sir, so we need GOLF two, MIKE one nine

C: Stand by, please, hold position

3) *C: X Y eight five, zero, what flight level do you wish ?*

P: We need flight level one hundred emergency, Mayday, Mayday, Mayday, X Y eight five.

4) *C: Speedbird seven four Delta, say again, please.*

P: Do we have to fly full departure route or do you give us a heading as usually?

C: Speedbird seven four Delta, say again, please.

5) *P : ABC zero two nine four, we would like to come back to the gate, please?*

C: ABC zero two nine four,roger and confirm, are you ready to taxi by own?

P: Yes, ready taxi by my own.

On the basis of these examples, it can be concluded that the communication between the pilot and the air traffic controller in the radiotelephony communication mode has phonetic, grammatical, lexical, syntactic and stylistic peculiarities [11].

Phonetic characteristics of radio broadcasting in general are subject to the general rules of the English language, and some phonetic differences concern pronunciation of digits (two, four, six) and the presence of special phonetic alphabet, which is characterized by acrophonic assigning of code words to letters of the English alphabet (PAPA, MIKE, DELTA), to provide clarity and unambiguity of each statement [11].

Syntactically, this type of communication is characterized mainly by incomplete grammatical structure of sentences, which lack subject, link verb "to be", as well as other minor parts of the sentence [11].

Stylistically radio exchange between the pilot and air traffic controller is characterized by neutrality, impersonality and lack of emotional expressions [11].

It is important to note that the professional (foreign language) communicative competence of air traffic controller takes a leading role during the radiotelephony exchange on international air routes. Therefore, professional (foreign language) communicative competence of the air traffic controller means foreign language communication knowledge, skills, abilities and capability of their appropriate usage for communication in the process of radiotelephony exchange with flights that operate on international air routes, in certain conditions of professional interaction; it means an integrative education of personality, which has a complex structure and acts as an interaction and convergence of linguistic, social and cultural, and communicative competence, level of development of which allows aviation professionals to effectively implement foreign language and, therefore, cross-language, cross-cultural and interpersonal communications [12].

Concern over the role of language in aviation accidents and incidents has been expressed from several quarters. Data obtained from the ICAO Accident/Incident Data Reporting System (ADREP) database, United StatesNational Transportation and Safety Board reports (ASRS), the United Kingdom Mandatory Occurrence ReportingSystem (MORS) and Confidential Human Factors Incident Reporting Programme (CHIRP) corroborate that the role oflanguage in accidents and incidents is significant [10].

Analysis of air crashes and prerequisities to them were as follows:

Trident/DC – 9 mid-air collision, Zagreb – 1976
Two B747 runway collision, Tenerife – 1977
B707 running out of fuel, airport Kennedy 1990
B757 aircraft collision with the ground, Cali – 1995
IL – 76/B747 mid-air collision, Delhi, India – 1996
MD83/Shorts 330, Paris – runway collision – 2000
MD80/Citation runway collision, Milan – 2001
Ty-154M/B757 mid-air collision, Germany – 2002
B737 – 500 aircraft crash, Perm, Russia – 2008

showed that their main reasons of miscommunication are the following:

a) Improper use of standard phraseology due to underdeveloped foreign language competence. b) Insufficient spoken language competence development;

c) Use of more than one language in the same airspace (lack of social and strategic competence). [13].

It is well known that the problem of occupational mobility dominates in a current world of work. Currently, a graduate of an engineering and technical educational establishment is an air traffic controller – a specialist, who demonstrates possession of the knowledge and abilities required to perform the safe air traffic control as well as the ability to implement professional and cross-cultural communication in multicultural/language environment. That is why, today the professional foreign language communicative competence is one of the most important component of an air traffic controller`s general professional competence [14].

ICAO Doc 9835 defines that the ICAO standardized phraseology is used in all situations for which it has been specified. And in case standardized phraseology is not sufficient for successful communication the plain language is used.

The aim of the ICAO standard phraseology is to cover routine and non routine situations. However, the prescribed phraseology cannot predict all possible spoken communicative intentions. Consequently, a need for the language beyond the narrow subset of the ICAO phraseology arose. This language is called plain English in aviation context. Therefore, the ICAO provisions provide improved guidance on the use of Aviation English and at the same time strengthen the provisions on the use of radiotelephony phraseology [15].

In the context of non-standard situations when standard phraseology is not enough to communicate successfully, a natural language plays a significant role in filling communication gaps. Consequently, the radiotelephony communication offers a selective use of plain English in non-standard situations [1].

Under the plain language in radio communication one means spontaneous, creative and non-coded to use a specific natural language [10].

A radio exchange in the context of performing typical professional task has some specific features regarding language factors, and it requires special skills to perform "from ground to air" communication which are the targets of language training [1].

37 samples of radiotelephony authentic episodes have been studied to find the ratio of phraseology and plain English (Table 2).

For the table, we have selected the highest percentage (plain English) during the radiotelephony communication in non-standard emergency situations.

Table 2. Some examples of air-to-ground language percentage (R/T communication in emergency)

№	Lexical items total	Standard Phraseology	Plain English	Ratio (%)
#1	765	281	484	**36,7**
#2	765	244	521	**31,8**
#6	416	113	303	**27,2**
#8	406	131	275	**32,3**
#9	764	166	598	**21,7**
#13	173	47	126	**27,2**
#17	235	48	187	**20,4**
#18	1169	474	695	**40,5**
#19	262	62	200	**23,7**
#20	484	123	361	**25,4**

Let us consider 14 radiotelephony authentic episodes dealt with various non-standard situations and induced air traffic controllers and flight crew members to use plain English. Some examples of the radiotelephony episodes analyzed are as follows:

1) *C: X DELTA X X X, X-Tower, good-afternoon, line up Runway one eight right*

P: We need VIP parking to pick up passenger, we need taxi instruction

C: X DELTA X, stand by

C: X DELTA X, do you need position another apron ?

P : Yes, sir, so we need GOLF two, MIKE one nine

C: Stand by, please, hold position

In this episode, the percentage of plain English is 36,7 %. This non-standard situation is about a VIP passenger landing and a taxi instruction.

2) *P: ABC four five five, we are now radar heading three three zero, we have pressurization problem ... pressurization, we starting emergency descent*

C: ABC four five five, say again please

P: ABC four five five, X

C: ABC four five five, sir, we are starting emergency descent, due to pressurization problem.

In this episode, the percentage of plain English is 31,8 %. This non-standard situation reveals a pressurisation problem and an emergency landing.

6) *P: Ground, KLM one three eight seven*

C: KLM one three eight seven, X-Ground

P: Yes, we have problem with nose wheel steering, it`s fully be to the left, so we have to remain position here, we request towing track

C: KLM one three eight seven, roger, shut down engine, wait for towing

P: Wait, shut down engines our position here and wait for the towing, KLM one three eight seven.

In this episode, the percentage of plain English is 27,2 %. This non-standard situation is related to a problem with nose wheel steering .

8) *C: X six nine XX, what kind of problem, report, please*

P: OK, no problem for us, we have a only ... only information mass on check

C: Information about?

P: And on runway we see bird flocks, on runway was birds

P: Now already, X six nine X X

C: X six nine XX, advise please, did you use extremely breaking?

P: On the right we see on birds, X six nine XX, it was problem for us. Now we are ready for departure, X six nine X X

In this episode, the percentage of plain English is 32,3 %. A problem with a flock of birds on the runway is revealed in this non-standard situation.

9) *C: XX three two XX, say again please, your problems*

P: We have avionics problems, X X three two X X

C: Roger, X X three two X X

C: XX three two XX, turn right, heading zero one zero, descend altitude six thousand feet, please

P: Right, heading zero one zero, descending altitude six thousand feet, XX three two XX

P: And, this is PAN-PAN XX three two X X. We have a problem with heading indicator on ILS, we can`t to maintain altitude and heading final, just keep, please.

In this episode, the percentage of plain English is 21,7 %. This non-standard situation is about a problem with an instrument landing system.

13) *P: Radar, LOT seven X X*

C: LOT seven X X, go ahead

P: Ok, would you please what type of the aircraft, it was near our position, one thousand feet above

C: LOT seven X X, Airbus three eight zero

P: Ok, in this case I would like to report, we have just passed wake turbulence area, it causes very extremely heavy turbulence.

In this episode, the percentage of plain English is 27,2 %. There is an example of turbulence problem in this non-standard situation .

17) *P: ABC eight seven five*

C: Go ahead

P: We just won`t inform you, we are receiving TCAS advisory alert from traffic climbing on hour nine o`clock position

C: ABC eight seven five, opposite traffic climbing three four zero

P: That`s understood, we received TCAS alert from that climbing traffic.

In this episode, the percentage of plain English is 20,4 %. This non-standard is about a dangerous mid-air collision.

18) *C: XXXX eight Charlie, what kind of technical problem do you have?*

P: We have a gears down and locked indicate, so it not rea l problem, but we can not go to cruse flight and we have to have at airport. No futher assist, and requirements

C: X X X X eight Charlie, roger

P: XXXX eight Charlie, may be do you need convenient make orbit about any point?

In this episode, the percentage of plain English is 4065 %. This non-standard situation is about the technical problems.

19) *C: MIKE ALPHA DELTA, please, advise reason*

P: No airspeed on the right side, we will come back. If I can just hold and check outside the aircraft see, there is something wrong, something blocked and a bit of use, and then I will go back to you, OK, we might be even to go, again in next five minutes

C: Roger, thank you

P: OK, MIKE ALPHA, we have the "follow me" in sight, request the parking spot, we will can check and we would to go yes or not.

In this episode, the percentage of plain English is 23,7 %. This non-standard situation reveals a problem with climbing.

20) *C: XXXX six PAPA, report the reason please*

P: We have smoke in cockpit, but we have not fire, light indication now

C: Do you need fire brigade?

P: Negative

C: I see.

In this episode, the percentage of plain English is 25,4 %. This non-standard situation is about a smell of smoke in the cockpit.

6. Conclusion

Based on the analysis of the percentage of the processed data of authentic texts, it may be concluded that the standard ICAO phraseology is used in all cases for which it is established. Only in cases when standardized phraseology cannot be applied during scheduled transmissions, then plain language is used. In radiotelephony communication, standard phraseology and plain language might be used in the switching off/on. Moreover, the languages can be used together in the same communication session [16].

Thus, the standard ICAO phraseology is a set of clear, short, internationally recognized formalized messages prescribed to be used in all standard situations and most emergency circumstances that occur. They are carefully worked out by aviation specialists and thus have a unique functional meaning and an unambiguous content. A plain language is clearly different, in which the content of the messages is determined by culture, context and disposition of the listener [16].

However, the standard phraseology cannot often provide effective communication due to its limited resources. It occurs in non standard, abnormal, and sometimes emergency situations which an aviation specialist encounters. It is also insufficient for conveying additional information about situations, for example, clarifying about the reasons for the delay, the condition of a sick passenger, weather conditions, the nature of the failure, obstructions on the taxiway. Under such conditions the plain English language is requested and is important to maintain safety [16].

The aforementioned arguments make obvious that new English teaching strategies should be developed and provided. This will require special training of English language instructors. The training should propose a new approach to simultaneous teaching of radiotelephony phraseology and plain English by using specially designed activities to learn how to switch on/off one language or another. A combined approach to training in phraseology and plain English brings the advent of a better and non-ambiguous radiotelephony communication if pilots strictly follow the rules concerning the radiotelephony communication language [15].

The training of Aviation English instructors should provide knowledge of phraseology, flight operation rules, language training for purposes of radiotelephony exchanges, plain English in aviation context, methodology of teaching trainees to switch off/on the languages in situations of emergency. The latter can be implemented during the simulator training for pilots.

Thus, the rationale for English language training course of aviation personnel must be an integrative language course of Aviation English designed to be used also during the simulator training and proposing special activities for radiotelephony communication in non standard situations based on integral use of both phraseology and plain English.

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Статтю присвячено питанню нового підходу до курсу навчання авіаційної англійської мови з метою підготовки до ефективного спілкування в режимі «земля-повітря». Це спілкування здійснюється із застосуванням фразеології радіообміну та звичайної англійської мови. У статті представлено результати аналізу усного дискурсу цього радіообміну. Питома вага використання фразеології та звичайної мови під час ведення радіообміну визначає подвійну природу цього спілкування, що має бути враховано під час розроблення навчального курсу з англійської мови, призначеного для мовної підготовки авіаційних фахівців відповідно до нових вимог ІКАО.

Ключові слова: авіадиспетчер; авіаційна безпека; екіпаж повітряного судна; професійна лінгвістична компетенція; радіотелефонний обмін; розмовна авіаційна англійська; спілкування англійською; стандартна фразеологія.

Е. П. Петращук[1], О. Н. Васюкович[2]. Обоснование лингвистического профиля учебного курса по авиационному английскому языку

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Статья посвящена проблеме нового подхода к курсу обучения авиационному английскому языку с целью подготовки к эффективному радиообмену «земля-воздух». Такой радиообмен осуществляется с использованием стандартной фразеологии и разговорного английского языка. В статье приводятся результаты исследования устного дискурса общения членов экипажа и авиадиспетчера. Удельный вес использования фразеологии и разговорного английского определяет двойственную природу этого вида общения, что необходимо учитывать при разработке учебного курса по английскому языку, предназначенного для языковой подготовки авиационных специалистов в соответствии с новыми требованиями ИКАО.

Ключевые слова: авиадиспетчер; авиационная безопасность; общение на английском; профессиональная лингвистическая компетенция; радиотелефонный обмен; разговорный авиационный английский; стандартная фразеологія; экипаж воздушного судна

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