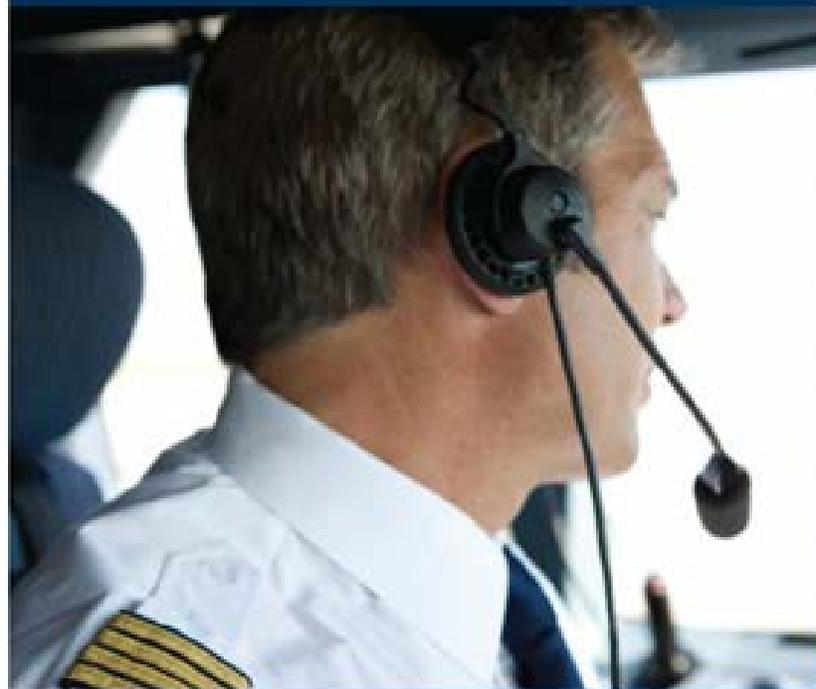


# Phraseology



**Pilots & Air Traffic Controllers Phraseology Study**





## NOTE

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**Senior Vice President  
Safety, Operations and Infrastructure  
International Air Transport Association  
800 Place Victoria, P.O. Box 113  
Montréal, Québec**



# Phraseology Report



**Project Manager / Author:**

*Hanada Said*  
Manager, Safety

**Approved by:**

*Chris Glaeser*  
Director, Global Safety  
Safety & Quality

**Consultant:**

*Capt. Mario Guillemette*  
*Capt. Jonathan Gillespie*

**Contributing Technical Experts:**

*Carole Couchman*  
Senior Technical Officer  
International Federation of Air Line  
Pilots' Associations (IFALPA)

*Dr. Ruth Stilwell*  
Representative to ICAO  
International Federation of Air Traffic  
Controllers' Associations (IFATCA)

*Members of the IATA Safety Group*  
(SG)



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## 1. INTRODUCTION

As the world becomes more and more “global”, language becomes a key factor in the efficiency of Pilot - Air Traffic Control (ATC) communications. Language and communication issues are very important because a miscommunication could potentially lead to a dangerous situation without any of the involved stakeholders being aware.

The use of standardized phraseology is one of the most important factors involved in the process of communication. It provides for quick and effective communication allowing us to overcome differences in language and at the same time reducing the opportunity for misunderstanding. Ambiguous or non-standard phraseology is a frequent causal or contributory factor in aircraft accidents and incidents.

The International Air Transport Association (IATA), together with the International Federation of Air Line Pilots' Associations (IFALPA) and the International Federation of Air Traffic Controllers' Associations (IFATCA), has jointly prepared an on-line survey regarding communication issues, focusing on the non-use of ICAO standard phraseology.

Separate surveys for both airline Pilots and Air Traffic Controllers were prepared to collate the lessons learned in the area of communications. The survey questionnaires were prepared and set-up so that participants could easily respond via a survey engine website on the internet.

The use of “Aviation English” was explicitly excluded from the report as this issue has been managed through other venues. The surveys were designed to identify areas where established phraseology, or local phraseology, has been, or has the potential, to be misunderstood.

Regional differences and analyses were made using the IATA regions, as shown in Appendix A to this report.



## 1.2 EXECUTIVE SUMMARY

This Phraseology Survey was directed by the IATA Operations Committee (OPC) and supported by the IATA Safety Group (SG) as a means of a study, collating Pilots and Air Traffic Controllers' input on areas where the non-use of ICAO standard phraseology results in actual or potential misunderstandings, or where local phrases create potential safety risks. This Phraseology report was created to present the findings of the surveys and to identify areas where additional analysis is required.

This study aims at the initial evaluation of the risk associated with the air-ground communication and performs a synthesis of the issues related to the safety of such events. IATA, in collaboration with International Federation of Air Line Pilots' Associations (IFALPA) and the International Federation of Air Traffic Controllers' Associations (IFATCA), conducted this study. The scope of the study was communication and the use of non-standard phraseology between Pilots and Controllers during all phases of flight.

A first step in reducing the incidence of communication problems is to identify the types of events and locations where they occurred. This survey of Pilots and ATC was organized within that framework to identify categories of events.

This report presents the analysis of

- 2070 Pilots survey responses
- 568 Air Traffic Controllers survey responses

It was notable that there was a reduced number of responses from both types of participants in regions where English was not the principal language. As a consequence, these surveys were translated into two other local languages in the hope of ensuring a broader scope of responses from all major regions of the world.

## 1.3 SCOPE AND OBJECTIVE

In aviation people from many different countries come together. This makes communication between airline Pilots and Air Traffic Controllers potentially difficult as many different languages and knowledge of foreign languages collide. Deviating from standard phraseology, Pilots and Controllers leave transactions open to interpretation. To identify high risk communication hazards associated with non-standard phraseology issues and to identify areas for further research and potential communications improvements and harmonization; two surveys were launched, targeting Pilots and Controllers.

It is to be noted that factors such as the use of non-standard phraseology, local accents, and the use of local languages in radio communication are infrequently reported as



contributing factors to incidents and accidents. However, the vast majority of the surveys' respondents stated that these factors were a concern and routinely caused misunderstanding. Noting that voice communications will remain the industry's primary means of Air Traffic Control communications, and that air traffic is forecast to increase at a very high rate for the foreseeable future, this survey is intended to identify areas for further research and potential communications improvements and harmonization.

## 1.4 CONTENTS

This report presents the analysis and results of the study on communication related safety risks, focusing on causes and mitigation recommendations in the content of phraseology.

- Results of the survey responses that were offered by Pilots in the survey questionnaire
- Results of the survey responses that were offered by Air Traffic Controllers in the survey questionnaire
- Quotes extracted from both Pilots and Controllers' surveys. The responses are written verbatim, without any attempt to correct the language.
- Top issues and hazards identified
- Conclusions
- Results of the survey responses that were offered by Pilots in the translated version of the Russian survey questionnaire
- Results of the survey responses that were offered by Pilots in the translated version of the Chinese survey questionnaire
- Online questionnaire used in the survey targeting all Pilots
- Online questionnaire used in the survey targeting all Air Traffic Controllers



## 2. PILOT SURVEY ANALYSIS

The International Air Transport Association (IATA) and the International Federation of Air Line Pilots' Associations (IFALPA) have worked in collaboration, along with a number of other industry groups, airlines, and unions, in requesting Pilots' participation in a ten (10) minute on-line survey regarding phraseology issues, especially in international operations. These organizations were involved in supporting the 14 question survey and encouraging member participation.

This section presents the analysis of 2070 total responses from Pilots related to communication problems. Survey responses are anonymous and cannot be traced back to the originator. The goal of this survey was to gain insights on different safety threats related to communication and is an attempt to itemize the issues that create difficulties for Pilots when flying in a new and unfamiliar environment.

For the purpose of the study, these issues will be called threats<sup>1</sup>. IATA safety programs support the Threat and Error (TEM) concept where a "threat" is defined as "an event or error that occurs outside the influence of the flight crew, but which requires crew attention and management if safety margins are to be maintained." Threats create challenges that can lead to errors which if not managed properly, can create undesired aircraft states which if not managed properly can lead to an accident. If the threats are known, they should be eliminated whenever possible, and if not, they should be mitigated through training and/or procedures. Reducing the number of threats reduces the possibility of errors, ultimately decreasing risk and increasing the safety margin for operators. An example of threat would be a flight crew who accidentally used the wrong call sign (creating a threat for ATCs and other flights). In this survey, the focus was on identifying phraseology that was mis-understood, or phraseology issues that potentially could be misunderstood.

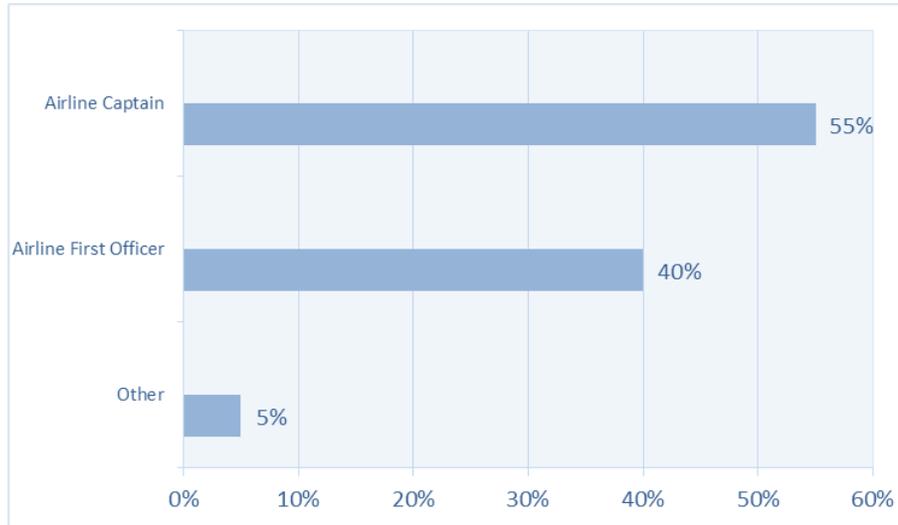
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<sup>1</sup> This threat and error process is called: The Threat and Error Management (TEM) Model by Dr James Klinect of the University of Texas in Austin, TX. The model was developed while collecting data in the early stages of the LOSA program (Line Operation Safety Audit) and is widely used in Aviation Safety. Website address is <http://homepage.psy.utexas.edu/homepage/group/helmreichlab/aviation/LOSA/LOSA.html>



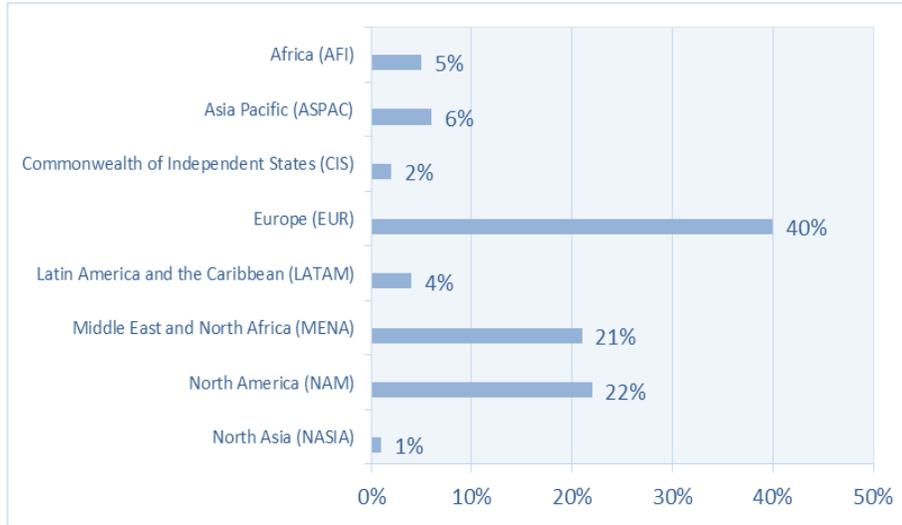
## 2.1 SURVEY ANALYSIS

**Question 1, 'I am an...':** The purpose of this question was to identify the flying qualification of the individual completing the survey. It was notable that 55% were Airline Captains, 40% were Airline First Officers and five percent (5%) were others including retired Pilots in management duties, safety officers with Pilot background, contract Pilot instructors, etc... There were no set targets for either Captains or First Officers and this representation is quite adequate for the purpose of this study.



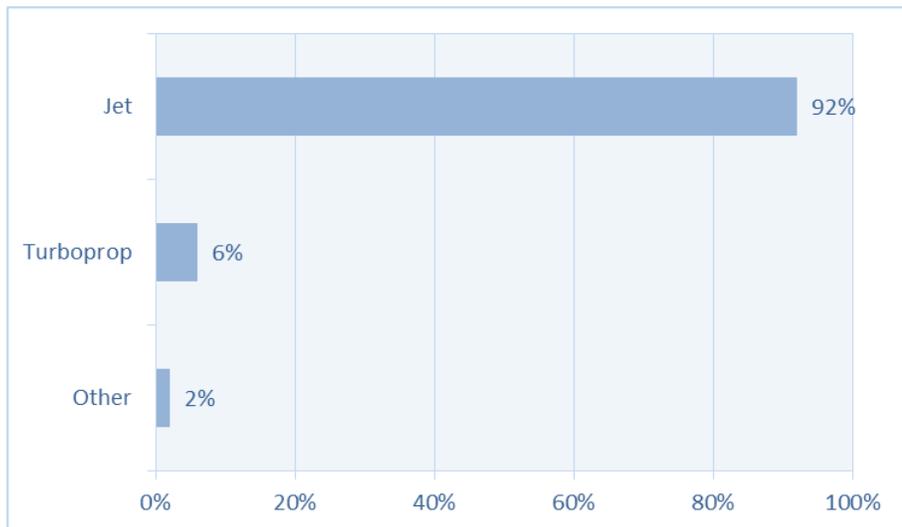
Question 1: I am an

**Question 2, 'I am based in...':** The regional composition of the survey participants had to be taken into account when drawing conclusions from the survey. The representation was adequate from all regions, with 40% being based in Europe (EUR) followed by 22% from North America (NAM); however, North Asia (NASIA) and Commonwealth of Independent States (CIS) did not participate in the numbers originally expected. To remedy this, the Pilot survey was translated into Russian and Chinese languages and analyses of these are presented in appendix B.



Question 2: I am based in

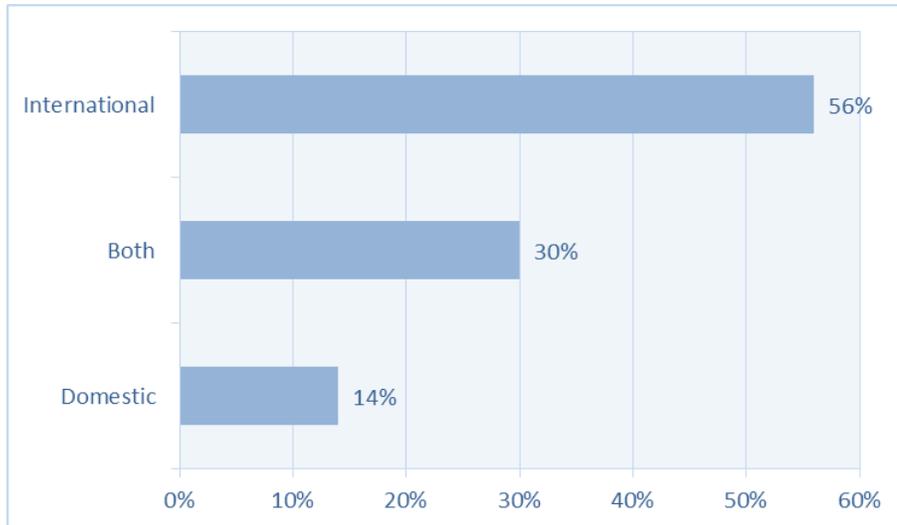
**Question 3, 'What type of aircraft do you mainly fly?':** This question identified the types of aircraft operated by respondents. The majority (92%) were Jet Pilots while six percent (6%) were Turboprop Pilots and two percent (2%) were Helicopter Pilots.



Question 3: What type of aircraft do you mainly fly?



**Question 4, 'My flying is mostly...':** Respondents were primarily Pilots who operated international flights (86%) or both international and domestic flights (30%). The targeted Pilot group was therefore very well represented.



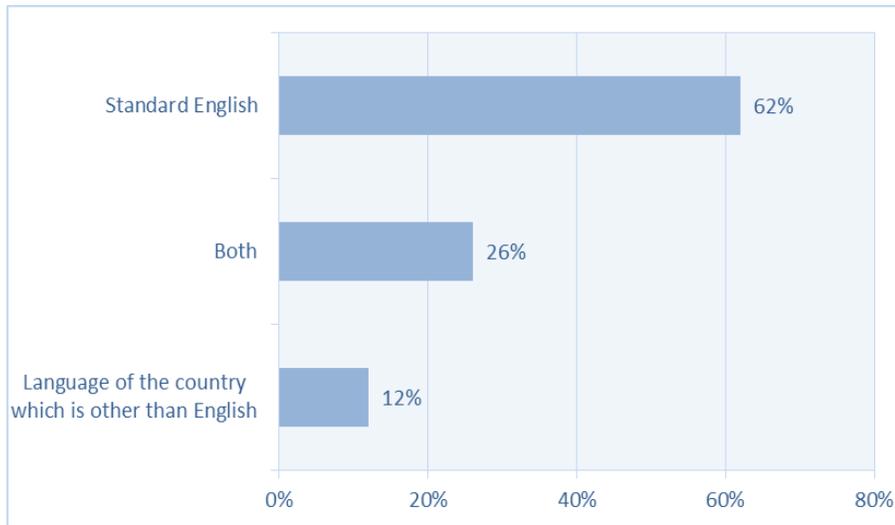
Question 4: My flying is mostly:

**Question 5, 'If I am based in a country where English is not the mother tongue, what language is used to communicate?':** This question addressed the use of native languages in aviation communication. A significant proportion of Pilots who responded (38%) used a language other than English to communicate at certain times. It is almost certain that Pilots in other aircraft with little or no knowledge of the local language operated in the same airspace and on the same frequencies as these pilots, leading to a potential degradation of situational awareness. This condition is an important factor for the remainder of the survey analysis.

International standards of phraseology are laid down in ICAO Annex 10 Volume II Chapter 5 and in ICAO Doc 9432 - Manual of Radiotelephony<sup>2</sup>. Many national authorities also publish radiotelephony manuals which amplify ICAO provisions, and in some cases modify them to suit local conditions.

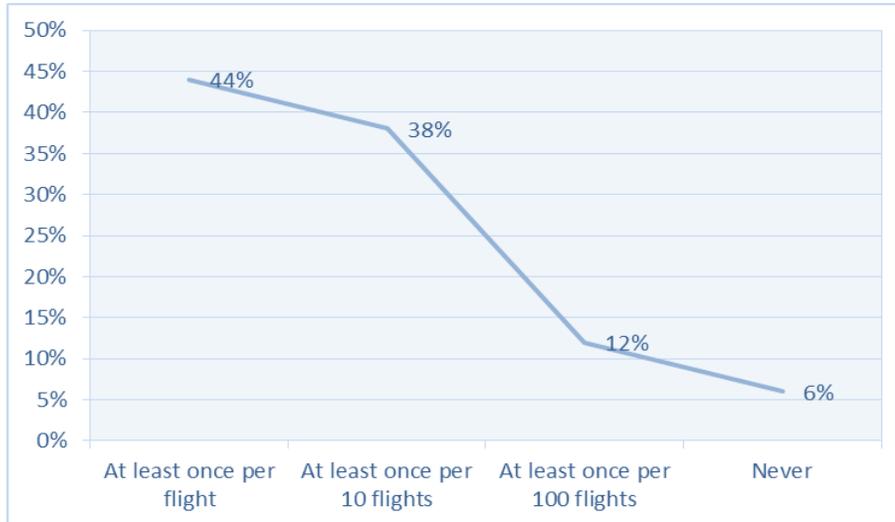
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<sup>2</sup> ICAO Doc 9432 AN/925, Manual of Radiotelephony, Fourth Edition 2007



Question 5: If I am based in a country where English is not the mother tongue, what language is used to communicate?

**Question 6, 'How frequently are you in a situation where ICAO standard phraseology is NOT used?':** 44% of all respondents indicated that they experience non-standard communication phraseology at least once per flight. 38% of participants experience this once per ten (10) flights and 12% once per 100 flights. However, six percent (6%) reported no experience of non-standard phraseology.

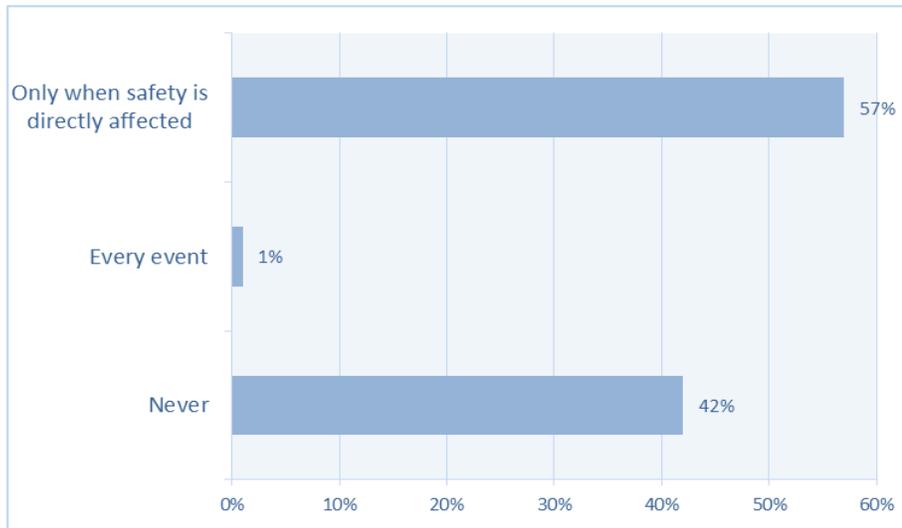


Question 6: How frequently are you in a situation where ICAO standard phraseology is NOT used?

**Question 7, 'How often do you report in your company reporting systems events where ICAO standard phraseology is not used?':** 57% of the respondents reported communication issues related to phraseology only when they encountered safety consequences. One percent (1%) of the respondents said that they report every event, and 42% indicated that they never report this type of event. Therefore, 99% of the

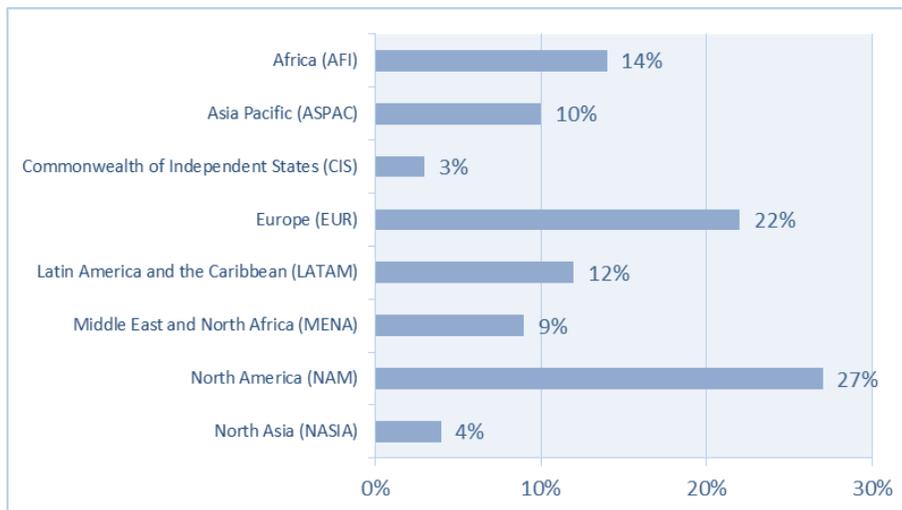


respondents do not report every event. A potential conclusion is that these events are so common that Pilots do not see the need, nor value, of reporting every event. The fact that 57% only report the higher risk events supports this conclusion.



Question 7: How often do you report in your company safety reporting systems events where ICAO standard phraseology is NOT used?

**Question 8, 'In what region do you most often experience an event where ICAO standard phraseology is NOT used?':** Responses revealed that North America (NAM) had the highest proportion of events with 27%, followed by Europe (EUR) with 22%. The fact that many participants indicated that they have encountered an experience in a particular region should be considered in relation to their exposure and destinations.



Question 8: In what region do you most often experience an event where ICAO standard phraseology is NOT used?



It is worthwhile to compare the geographic distribution between the regions most affected in terms of respondents' exposure, with the distribution of the region where the respondent's airline was based. Figure 1 illustrates this comparison.

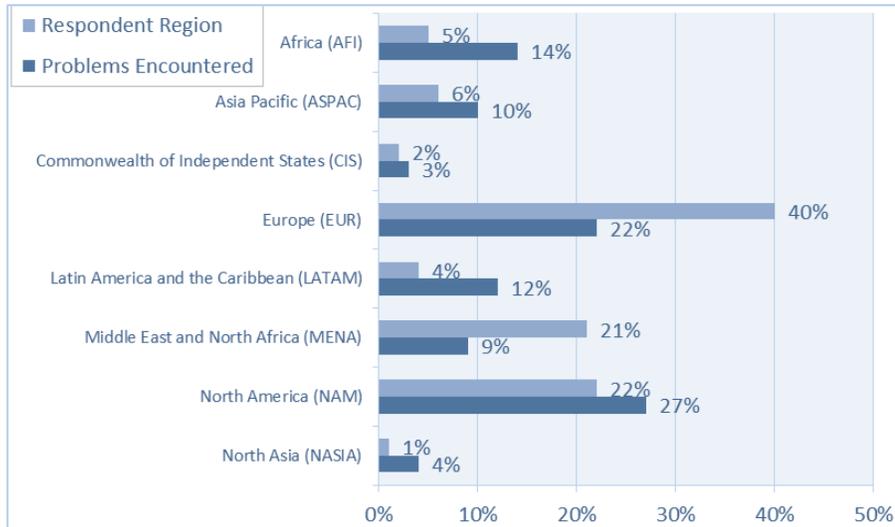


Figure 1: Respondent region vs. problematic region

Table 1 below presents a comparison of the geographic distribution between the regions of the respondent versus the regions where they encounter the most communication issues. 1957 Pilots responded to this question. Pilots primarily encountered events in their own region. However, for:

### North America (NAM)

- 526 Pilots (27%) selected NAM as the region in which they most frequently encountered non-standard phraseology. Of these 209 (40%) were North American based Pilots.
- The next largest groups to select this region were Pilots from EUR with 164 (31%) followed by 93 (18%) from MENA, and 31 (6%) from ASPAC.

### Europe (EUR)

- 435 Pilots (22%) selected EUR as the region in which they most frequently encountered non-standard phraseology. Of these 360 (83%) were European based Pilots.
- The next largest groups to select this region were Pilots from MENA with 38 (9%) followed by 16 (4%) from NAM, and 10 (2%) from AFI.

### Africa (AFI)

- 267 Pilots (14%) selected AFI as the region in which they most frequently encountered non-standard phraseology. Of these 76 (28%) African based Pilots.



- The next largest groups to select this region were Pilots from EUR with 98 (37%) followed by 81 (30%) from MENA.

### **Latin America & the Caribbean (LATAM)**

- 233 Pilots (12%) selected LATAM as the region in which they most frequently encountered non-standard phraseology. Of these 57 (24%) were LATAM based Pilots.
- The next largest groups to select this region were Pilots from NAM with 104 (45%) followed by 54 (23%) from Europe and 17 (7%) from MENA.

### **Asia Pacific (ASPAC)**

- 201 Pilots (10%) selected ASPAC as the region in which they most frequently encountered non-standard phraseology. Of these 71 (35%) were ASPAC based Pilots. The next largest groups to select this region were Pilots from MENA with 61 (30%) followed by 32 (16%) from NAM and 30 (15%) from EUR.

### **Middle East and North Africa (MENA)**

- 168 Pilots (9%) selected MENA as the region in which they most frequently encountered non-standard phraseology. Of these 112 (67%) were MENA based Pilots.
- The next largest groups to select this region were Pilots from EUR with 29 (17%) followed by 12 (7%) from NAM.

### **North Asia (NASIA)**

- 69 Pilots (4%) selected NASIA as the region in which they most frequently encountered non-standard phraseology. Of these 12 (17%) were North Asian based Pilots.
- The next largest groups to select this region were Pilots from MENA with 23 (33%) followed by 15 (22%) from EUR and 8 (12%) from NAM.

### **Commonwealth of Independent States (CIS)**

- 58 Pilots (3%) selected CIS as the region they felt did not use ICAO standard phraseology. Of these 10 (17%) were CIS based Pilots.
- The next largest groups to select this region were Pilots from EUR with 29 (50%), followed by 10 (17%) from MENA.



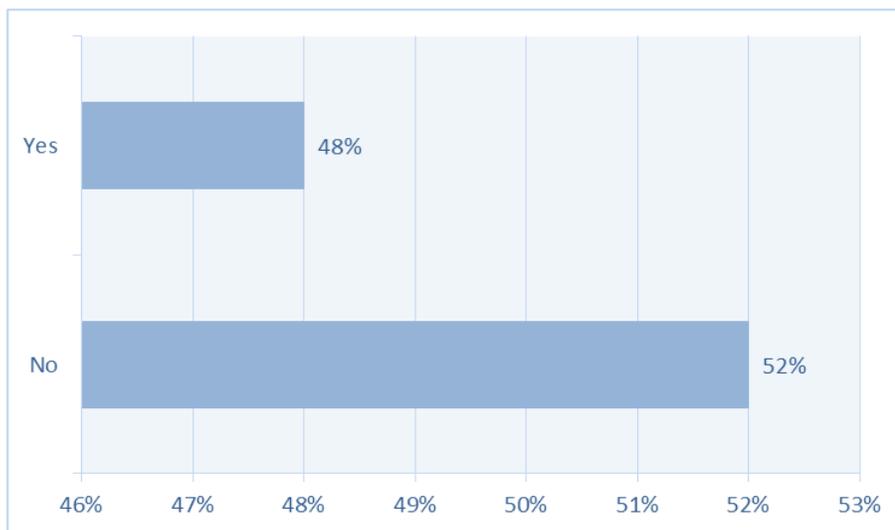
Problematic Region	Reporting Operators' Region							
	AFI	ASPAC	EUR	CIS	NAM	NASIA	LATAM	MENA
North Asia (NASIA)	1	4	15	6	8	12	0	23
North America (NAM)	2	31	164	5	209	8	14	93
Middle East and North Africa (MENA)	3	6	29	6	12	0	0	112
Latin America and the Caribbean (LATAM)	0	1	54	0	104	0	57	17
Europe (EUR)	10	5	360	3	16	3	0	38
Commonwealth of Independence States (CIS)	0	1	29	10	7	1	0	10
Asia Pacific (ASPAC)	3	71	30	1	32	3	0	61
Africa (AFI)	76	3	98	3	4	1	1	81

Table 1: Geographic Region distribution between the regions of the respondent versus regions of events

In summary, the analysis showed that North American Region had the highest number of events in which ICAO standard phraseology was not used. This echoes the results of the Air Traffic Controllers' survey in the next section, in which Controllers identified a greater number of North American Pilots not following ICAO standard phraseology. The analysis also demonstrated that very few Pilots encountered events in Europe besides European based Pilots themselves.

**Question 9, 'Is there an airport(s) where ICAO standard phraseology is not used?':** 48% of respondents experienced airports at which ICAO standard phraseology was not used.

If the respondent answered yes, they were offered a free text box to identify the airport which presented them with the most communication threats. Free text responses showed that many respondents were of the opinion that in aviation communication, English should be the only language. A number of respondents remarked that the use of local languages at international airports should be minimized and possibly not allowed.



Question 9: Is there an airport(s) where ICAO standard phraseology is NOT used?



Figure 2 below shows the number of times a specific airport was identified by the respondents as presenting communication threats. CDG was most often identified but in almost all cases it was because of the use of both English and a local language in Pilot communication and not specifically for non-standard phraseology. The same was true for MAD, PEK, BCN, YUL, PVG, EZE, ORY, LIM, CCS, and GRU. For JFK, ORD, LAX, BOS, EWR, MIA (all in the USA), the use of local phraseology or a term other than ICAO standard caused concern for many non-US based pilots.

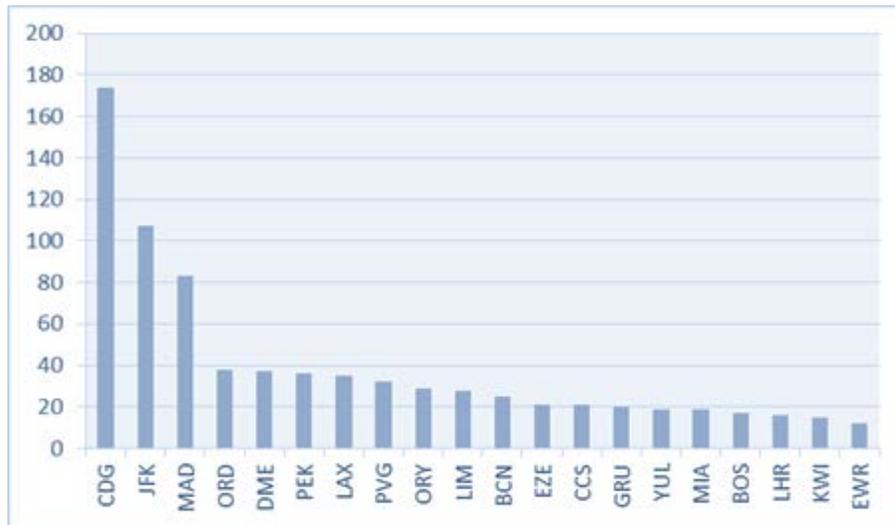
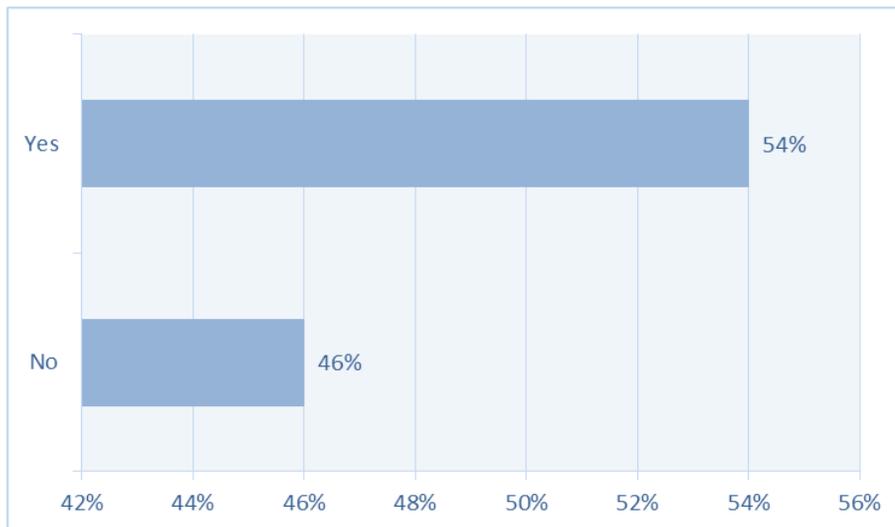


Figure 2: The airport(s) where ICAO standard phraseology is NOT used

**Question 10, 'Is there a procedure or a common practice used by pilots or ATC that causes misunderstanding or errors?':** 54% of respondents indicated that there was a procedure or a common practice used by either Pilots or Controllers that created a threat of misunderstanding and/or errors.



Question 10: Is there a procedure or a common practice used by pilots or ATC that creates misunderstanding or errors?



In order to provide further insight Pilots were given the opportunity to enter the specific conditions that could lead to a threat for them in day to day operations. The responses are naturally subjective but of sufficient interest as to warrant inclusion in this report.

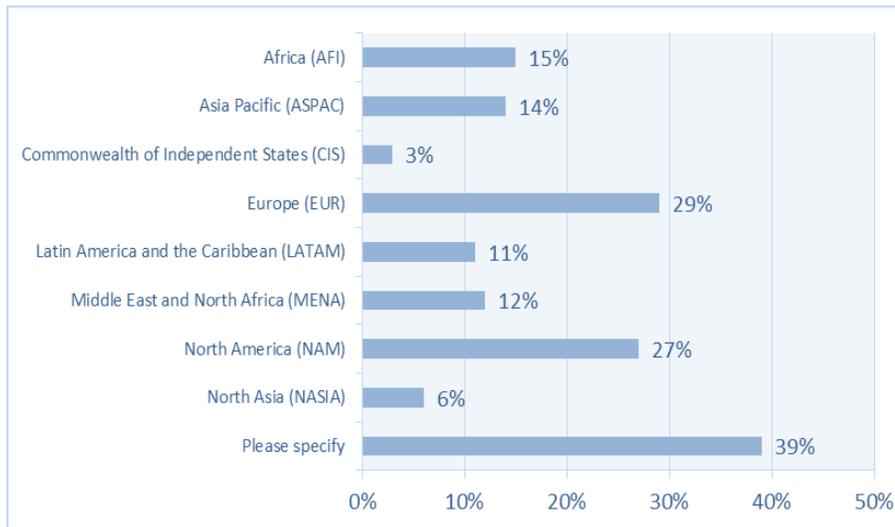
The following is a summary of the most common conditions reported by Pilots in which they identified confusion, especially when frequencies were busy, had a weak signal or static.

- The use of mixed languages with international crews speaking English with ATCs and the local crews speaking the country's language was by far the most often mentioned condition throughout the survey. Pilots indicated that this resulted in their situational awareness being reduced. They had difficulty deciding when to make a radio call without interfering in another crew/ATC communication. This issue was compounded by frequency congestion and may have led to crews 'stepping on' each other's transmissions.
- The lack of standardization in communications was the second most frequently mentioned condition and included reference to the use of slang, the use of a local holding area which was not on the airport diagram, improper usage of the phonetic alphabet (e.g., "Nectar" instead of "November") and the use of call signs where ICAO standard terminology was not used. This condition was most commonly noted in communications within the US.
- For altitude references, the use of the words TO and TWO, and FOR and FOUR was noted as a potential contributing factor in altitude errors (e.g., "cleared to seven thousand" understood as "cleared two seven thousand").
  - If in an area where the transition altitude is 18000 using "cleared to ten thousand" could be construed as "cleared two-ten thousand". Therefore, when using altitude the use of the word "to" could be very problematic.
  - In regions where flight level (FL) is used, the omission of FL in combination with the word "TO" could also cause a threat. (e.g., "cleared to ten" when the correct clearance is "cleared to FL one zero zero this can be mistaken for "cleared 210".
- For heading changes the use of "TO" instead of "heading" could result in confusion with a level change clearance (e.g., "turn TO zero five zero" instead of "heading zero five zero" could be mistaken for clearance to climb/descend to flight level 050).
- The lack of clarity in the applicability of speed and altitude restrictions when using SID's and STAR's. This issue will be analyzed in more detail under question 14.



- The lack of standardization in the use of call signs was also noted. The use of an incomplete or non-standard call sign by either a Pilot or a Controller could increase the risk of communication errors and misunderstandings.

**Question 11, 'If you answer yes to Question 10, please identify the region in which the airport is located and describe the specific threat or misunderstanding':** 29% of respondents identified airports within EUR region, followed by NAM region with 27%. 39% of respondents provided specific examples and locations where they encountered threats, eight percent (8%) indicated an issue with India (FIR and Airports) followed by five percent (5%) in China (FIR and airports).



**Question 11: If you answer yes to question number 10, please identify the region in which the airport is located, and describe the specific threat or the misunderstanding**



Free text responses to Question 11 are quoted below:

*Similar Flt numbers on different airlines*

*Usage of native language with all domestic traffic*

*In various USA airports, mostly JFK... "clear to go" is a horrible example*

*Misunderstanding of clearance onto an active runway. Threat of being on an active runway with traffic on short final.*

*Large US airports, particularly those above (KORD, etc), controllers talk too fast, so you can't quite get all the clearance, but you don't want to ask for a readback because they are so busy. Area of most trouble is with ground control, then tower. It gets progressively better as you go to terminal, then center.*

*Headings can be mistaken for levels and visa versa.*

*Multiple call signs very similar*

*Misunderstanding between taxi clearance and line up clearance. Misunderstanding leading to stay at initial level*

*Misunderstanding, potential loss of separation*

*Speaking fast with strong aggressive accent in a non std ICAO and speaking another language with local operator*

*Non-standard phraseology, improve threat in control-transfers*

*Is aircraft cleared to line up with preceding aircraft still holding at threshold*

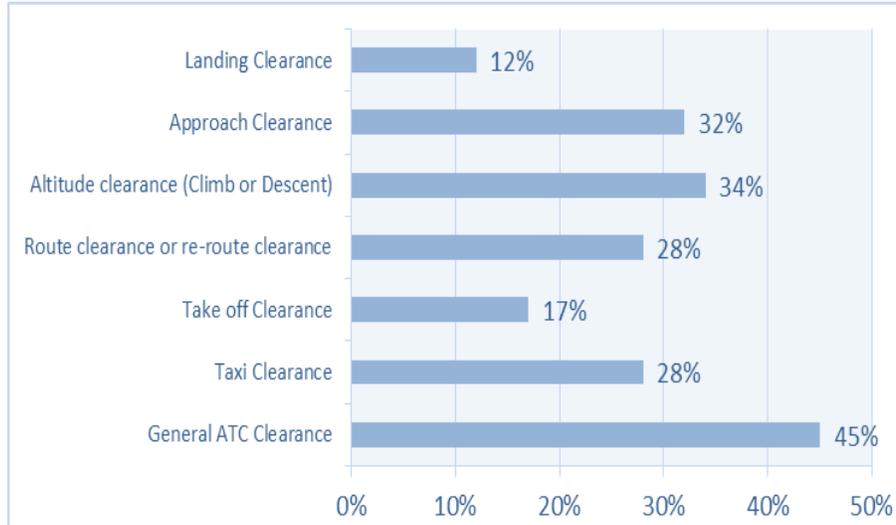
*Line up and wait / hold*

*Specific SID crossing altitude deletions*

*Line up clearance or rwy crossing clearance with rwy hold short red light illuminated. 2.- tight turns into ILS, increasing the chances of interfering into a parallel approach*



**Question 12 ‘In what situation does this typically occur?’:** In relation to Questions 10 and 11 respondents could choose one or more clearances typically affected by non-standard communications.. Landing and take-off clearances were identified as least affected, perhaps because they are relatively simple. More complex clearances for other phases of flight were more frequently affected.



**Question 12: In what situation does this typically occur?**

Responsibility for safe operation and the safe execution of procedures rests on the shoulders of both Air Traffic Controllers and Pilots. Without the interest and attention of both parties, the safe operation cannot work in harmony, and achievement of safety is impossible. Misunderstanding of an ATC’s clearance in any of the flight phases may result in both Pilot deviations and / or operational errors.



Some examples of non-standard phraseology in ATC clearances reported by Pilots in the survey, which may or may not have had any consequences, are:

*Confusion over clearance - present position direct to, or cleared via filed flight plan routing*

*Long clearances "hdg ...+ spd ...+ climb/descend to ...+ clear for ...+ change to frequency ..." very hard to remember all*

*Can cause confusion as to whether a hdg or FL*

*"Clear Direct Heading to XXX", which creates confusion whether ATC wants us to track DIRECT to XXX or maintain a specific HEADING. Another regular ATC CLEARANCE: "Climb To Five Thousand", which could easily be interpreted as "Climb TWO Five Thousand"!*

*Pushback and taxi clearances using very confusing terms and gate hold procedures that amount to frustration and the occasional bout of rage among pilots, especially if they're from another area.*

*If there is no arrival procedure, there is often a very confusing descent clearance. Example; "at 50 miles from xxx, descend to xxxx ft." Also, there are so many transitions on departures, it can be difficult to understand departure clearances due to English not being the mother language.*

*When being cleared for take-off for an RNAV departure there are times when the phrase "clear for takeoff" creates confusion for some because most airports with Rnav departures use "clear for takeoff and state the Rnav departure" . I like to see all CLEARANCES to include the Rnav departure.*

*When assigning a speed, sometimes we hear a CLEARANCE like this: "Reduce speed to two two zero knots". Perhaps it would be better to use "Reduce two two zero knots" or "Reduce to two twenty knots", since using "to (target)" can get confusing. Same thing happens with headings and altitudes with potentially dangerous outcomings.*



Other observations from the survey regarding ATC clearance during Taxi Operation included:

*ICAO procedures should push for all airports to provide clearances before pushing, to allow pilots time to study and discuss the clearance before operating the aircraft. Receiving clearances during taxi requires pilots to program their FMS's at that time, distracting them from their taxi operation.*

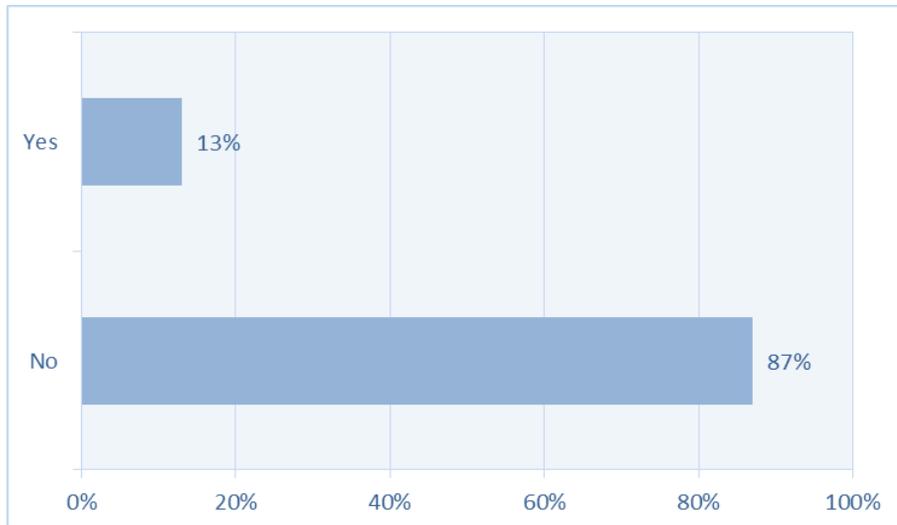
*India, Sri Lanka and other countries where the route clearance is given during taxi out or just prior to reaching the departure runway.*

*ATC clearance given to pilot while taxiing*

*Taxi instructions whilst still at speed on landing roll. A repeated ATC clearance is always spoken faster than the first time whereas it should be slower*

Taxiing is a high workload phase of flight that requires the full attention of the Flight Crew. To increase safety and efficiency, it is necessary to lessen the exposure to hazards and risks by holding the Flight Crew's workload to a minimum during taxi operations. ATC should, whenever practical, give ATC en-route clearance prior to taxi<sup>3</sup>.

**Question 13, 'Are you aware of misunderstandings/interpretations or common errors made when using CPDLC?':** The vast majority of Pilot respondents indicated that they do not encounter communication difficulties with the use of Controller Pilot Data Link Communications (CPDLC). However, two percent (2%) of the respondents indicated lack of awareness about CPDLC, and 13% reported encountering specific issues.



**Question 13: Are you aware of misunderstandings/interpretations or common errors made when using CPDLC?**

<sup>3</sup> ICAO Doc 9870 AN/463, Manual on the Prevention of Runway Incursions - First Edition — 2007



The most common issues identified with CPDLC were as follows (in descending order):

- The number\length of free text messages, unknown abbreviations and use of non-standard phraseology.
- Conditional clearances for a specific time or location that can be ambiguous or subject to interpretation. On some aircraft the conditional clearance can be on page 2 of the display, which can cause confusion.
- New York region issues non-standard clearances for the route or re-route portion.
- Pilot behavior in accepting a clearance before reading it.

**Question 14: ‘This question is more about practices that Pilots experience that are not always standard around the world thus creating a threat: Is there a procedure or a common practice used by pilots or ATC that creates a threat? Is there a local phrase that is often misunderstood?’** Pilots were invited to list practices they have observed that were not necessarily standard in all countries, creating a potential threat. Respondents were able to comment on procedures or common practices used by Pilots or Controllers that could possibly create a threat, especially for Pilots unfamiliar with a region. Pilots were encouraged to contribute because their knowledge was needed to help in the creation of a worldwide database of threats. In total 1044 participants offered additional comments, which have been summarized below.



➤ **Non-standard phraseology:**

The use of non-standard and/or ambiguous phraseology Air Traffic Controllers was cited in 27% of observations, including:

*Use of phrase "down/up to 80" instead of "climb/descend flight level 80".*

*USA: total lack of standardisation, eg "change one twenty five five": is that 120.55 or 125.5*

*Variations on "line up and wait" Variations on altitude phraseology*

*On the ground the ATC says « follow the traffic ahead of you » this created a runway incursion...*

*Some ATC agencies in the MENA region will clear the flight from position "XXX YYY", meaning via the published/planned route, while other nearby agencies will use the same terminology to mean direct between the stated points.*

*The term "Shuttle Climb" is referenced in CYVR missed approach procedures. This is neither defined in Jepps nor understood by FAA*

*Certified pilots. It is an ambiguous direction that is more often misidentified as a "Max Rate Climb" rather than a climb at holding speed.*

*ATC USA: Rwy full length available*

*When given direct routing, we hear "fly to", "got to", "proceed to". There should be only one wording: "direct to" (Boeing and Airbus use this on their FMS).*

*FAA VS ICAO*

➤ **SID'S/STAR'S:**

23% of the remarks included a misunderstanding between Controllers and Pilots about altitude/speed constraints on SID's and STAR's, some of which resulted in operational errors. Analysis of the Air Traffic Controllers' survey later in this report indicated that the number one issue was also the confusion regarding applicability of these constraints. A lack of consistency between various regions of the world was clearly identified by the respondents of both surveys.



The examples below have been taken directly from comments made by Pilots answering the survey:

*SIDs and STARs require airplane to comply with all altitude restrictions, either climbing or descending, unless the ATC specifically cancel the restrictions at a specific intersection, and when doing so, sometimes the ATC asks pilots why they are levelling instead of continue the climb or descent;*

*Altitude restrictions in SID STAR*

*High workload after airborne with a SID change and altitudes giving in meters*

*There is no consensus whether altitude restrictions on SIDs and STARs are deleted or still applicable if assigned another altitude, i.e., certain countries this applies but in rest of world this does not. Lack of standard phraseology to indicate whether altitude restrictions are deleted or not;*

*The inconsistent procedure for clearance to climb/descend on SID's and STAR's is a source of confusion and requires additional communication for clarification. This uses often scarce communication time;*

*In country XXXXX crossing altitude restrictions still apply even when off route. You are still required to adhere to the restriction now passing abeam that position at the specified altitude. This only applies to country XXXX;*

*When approaching on a STAR radar service clears you "Direct to a waypoint" sometimes they mean cancel the star and fly direct other times they mean fly the STAR and continue to that waypoint. I think the word Direct is not properly used.*

➤ **Words/Number pronunciation:**

The use of the words "TO" and "TWO", and "FOR" and "FOUR" (as in Question 10 above) was the second most common threat with 14% of observations. Some Pilots observed that when using altitudes (below transition) as opposed to flight levels, the possibility of error is greatest. It was recommended that the words "altitude" or "flight level" be used in all altitude/level change clearances. For example: "Airline XXX climb to altitude five thousand feet", rather than "Airline XXX climb to five thousand", which could be easily misunderstood as "Airline XXX climb two five thousand."



It was also observed that when the prefix “flight level” was not used, it created a situation where these words could be mistaken for numbers. Therefore, it is important to use FL when appropriate.

*Using words as TO, FROM etc... are supposed to be expelled from phraseology. This is why we have inbound XYZ, XYZ inbound, NEXT etc... in our "word base";*

*ATC often uses the word TO (two?) when issuing descent or climb clearances;*

*Use the word "To" on an Altitude clearance. Example "Clear to 3 thousand feet". Am I clear 3000 feet or 23000 feet?*

*Both ATC and pilots commonly use Climb/Descend TO a FL and omit to use Climb/Descend TO ALTITUDE xxxx THOUSAND FEET. Also the word 'DEGREES' is often omitted when assigned a heading of eg 240 (DEGREES)*

*Descend to (two?) 2000 feet'. Why not say descend 'altitude 2000 feet'?*

*Frequently used is for example Descent to(Two)three zero zero instead of descend FL300*

*The word to and the number two quite often can lead to misunderstandings.*

*My complaint is ATC not using "Flight Level" or "Altitude" before a climb or descent clearance and not using the word "Degrees" after a heading instruction. Even in your example "Climb to (two?) nine zero" Should be "Climb to (two?) Flight Level nine zero". This removes the possible error/threat.*

### ➤ **The use of language other than English in communication**

Language was mentioned on many occasions throughout the survey and represented overall the most common observation by Pilots flying international operations. The fact that a local language was used between local Pilots and between local Pilots and ATC was felt to reduce the situational awareness of non-native Pilots. Pilots again expressed difficulty in knowing when to call (as in Question 10 above) because they were unable to determine if the conversation was over between Controllers and local Pilots. The following are Pilots' observations with regard to the use of local language:



*Foreign crews do not understand French language and that affects situational awareness*

*Use of local language for chat and clearances to other aircraft on the frequency destroys situational awareness*

*Local language leads to loss of SA by other carriers*

*Use of Chinese to domestic traffic but English with others. This reduces SA*

*General misuse of the English language, along with two different languages being used, depleting Situational Awareness*

*Reunion/Madagascar. Comms between aircraft and ATC in French. Breaks down the situational awareness if you do not understand French or any other local language in the specific region.*

*Whilst in Canadian (Quebec) airspace the insistence of both pilots and ATC to speak French. This seriously degrades situational awareness for non-French speakers.*

*Use of a foreign tongue to locally based pilots, that if you do not speak means that you are not completely aware of what is happening around you with regards to other traffic*

*Mixture of English and local language*

11% of the remarks included an observation about the use of native language in aviation communication, especially in countries in EUR, CIS, LATAM, and NASIA. Pilots believed that the use of a single language (English) would help to improve their situational awareness and avoid other communication problems. The following is a typical example of a suggestion to use only one single language (English) in communication:

*In some countries where native language is used with native flights other than English reduces situational awareness significantly, especially in busy terminal areas. In my humble opinion, I think English should always be used due to safety issues.*



The FAA sponsored a study titled: U.S. Airline Transport Pilot International Flight Language Experiences, Language Experiences in Non-Native English-Speaking Airspace/Airports<sup>4</sup>. From their report dated May 2010 below is a quote from one of the pilots that was interviewed:

*During one part of the interview, a pilot answered a question that expressed the sentiment of many pilots. The question was, “When controllers are speaking in their native language to their own pilots, is that much of an issue for you?” to which the pilot replied, “I feel out of the loop because I don’t know if the foreign carrier coming in might be conflicting traffic for me. You kind of know what the controller’s asking them and what they’re acknowledging. So, everybody’s sort of on the same sheet of music. I really have no idea what the controller might be asking the pilot. It makes me a little uneasy; for the most part, I guess they’re keeping things sorted out, I hope.”*

➤ **Speech rate:**

The issue of speech rate was addressed in five percent (5%) of the observations by respondents. The FAA study mentioned above discussed speech rate and stated that “US Pilots reported that the Controllers’ speech rate was the biggest problem they experienced in communication. As traffic load increased, so did the rate of speech and the number of repeated transmissions. Some Pilots perceived that Controllers may speak faster, either to mask a lack of proficiency or to show off their proficiency. In fact, the ICAO Language Proficiency Rating Scale contained in Doc 9835 (ICAO, 2004)<sup>5</sup> evaluates the fluency dimension of proficiency using tempo as one element of consideration – a faster tempo received a higher mark for fluency. Therefore, while learning English, Controllers might be told to speak faster to obtain a higher score on this dimension. They may continue to speak quickly once in the control room, although they may be less proficient on other dimensions. In general, speaking fast does not help to understand the instructions better, especially when English is not a native language.”

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<sup>4</sup> DOT/FAA/AM-10/9, U.S. Airline Transport Pilot International Flight Language Experiences, Report 3 Language Experiences in Non-Native English-Speaking Airspace/Airports

<sup>5</sup> ICAO Doc 9835 AN/453, Manual on the Implementation of ICAO Language Proficiency Requirements, First Edition 2004



Examples of observations by Pilots with respect to speech rate:

*ATC providing too many instructions within one clearance ie altitude, heading, airspeed in same clearance. Controllers in general speaking to fast due to high volume of traffic and working several frequencies at once;*

*Controllers usually speak to quickly and with strong accent, that can be dangerous. Pilots are also afraid of the consequences of an initial misunderstanding. It's stressful without perceivable benefits;*

*Comms to quick, resulting in say again or confusion.*

*Authorized for X or Y approach, and then cleared to a point that is not on that specific approach. Reading of clearances extremely fast and then having to ask say again slowly 3 times.*

Another language related issue was the observation by Pilots from non-English speaking countries that Controllers in English speaking countries have a tendency to speak fast<sup>6</sup>, use local phrases, slang or non-ICAO phraseology, making it difficult for them to understand. Below is an example of an observation from the survey:

*My experience is that most controllers in Australia speak too fast and in a slang that is very difficult to understand. Also they use the "climb TO nine zero". Also in the USA they often speak too fast and with a very strong accent. It is funny to see (hear) that most problems arise in so called English speaking countries. Also India is a big problem as they often seem to think that the faster they speak, the better they know the language. China and most other Asian countries have improved tremendously over the past years.*

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<sup>6</sup> Flight Safety Foundation, Aerosafety World, Say again, please, May 2011, Linda Werfelman



➤ **Multiple Instructions:**

Pilots indicated that when they received several ATC instructions at once, they were more susceptible to errors of understanding. Communications should be short and include concise instructions, and not be given during critical phases of flight (e.g., at high speed during landing rollout). Examples of quotes from the survey with respect to multiple instructions:

*Sometimes, controllers give too many instructions on a single call;*

*Long streams of instructions with multiple numbers (alt, speed, heading, crossing alt, etc...);*

*When the aircraft is slowing down to taxi speed (around 100 KTS), the tower gives you all kinds of taxi instructions including crossing a runway. This is not the best time to overload the first officer. The aircraft is still at high speed and the FO still has duties to carry. The tower should at least wait until the aircraft is off the runway or engaged on the taxiway*

*Multiple instructions in one clearance...ie heading/alt/speed/turn*

*Speaking too fast with multiple instructions.*

*Controllers often issue more than 2 instructions in a single transmission.*



- Air Traffic Controllers giving multiple instructions combined with very rapid speech was cited in eight percent (8%) of observations. Examples of such factors quoted from the Pilots' survey are:

*Too many instructions/clearances in one transmission*

*Too much information in a single message, specially during taxi instructions. Inflight, speed, headings and altitudes are not given in a standard and logical way, sometimes in different order. A logical order, speed/hdg/alt, according to most Boeing MCP display, could help a lot.*

*Transmitting instructions that contain multiple elements*

*Too many information (ex: more than 3 instructions). Use of slang that might be difficult to understand for non-native English speaker.*

*Rate of speech in many MENA countries combined with the local accent*

*Own wordings are often used. In local accent. Plus speed of speech.*

*Use of very rapid speech, mostly by atc*

*Fast mumbled taxi clearances*

*Sometimes controllers are so busy that they don't speak clearly in an effort to say the instructions as quickly as possible.*

*Multiple instructions that involve level, speed and conditional clearances, in busy airspace*

ICAO recommends maintaining an even rate of speech not exceeding 100 words per minute. When a message is transmitted to an aircraft and its content needs to be recorded the speaking rate should be at a slower rate to allow for the writing process<sup>7</sup>.

- Air Traffic Controllers' accent/slang, non-native and poor English were cited in 17% of observations. The use of French by French Controllers to French Pilots was cited as number one non-English language, followed by Spanish, Italian, Russian and Chinese. Some quotes extracted from the Pilots' survey:

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<sup>7</sup> ICAO Annex 10 Volume II Aeronautical Telecommunications



*ATC/Pilot communicates in French which leaves other pilots out of the clue...*

*Voice in Spanish/French to local operators and therefore identification of possible threats decreased.*

*Half of the communication is in French which can result in a loss of awareness.*

*Lack of English capability in China. Chinese is often spoken by ATC to Chinese pilots*

*Use of Spanish/Chinese instead of English*

*South American and Russian pilots are very hard to understand due pronunciation and omission of words. Greatest safety hazard though is the incorrect interpretation of ATC clearances and the failure of ATC to correct erroneous readback from pilots.*

*They speak normally in mother language and the English level is very poor.*

*language of the country such as French Spanish Chinese and Russian spoken on the radio*

*Speaking French and Italian all the time with local Airlines*

*Rapid speech and use of slang*

*Common (spoken) language, slang.*

*Use of slang, idioms, metaphors etc*

*When either pilots or controllers use slang or heavily-local accent in their transmissions eg Americans and other native-english speakers. They have tendency of not using standard phraseology as long as they are using English (in their local twangs, irrespective), they reckon the rest of the world ought to understand them.*

*Use of slang instead of standards (like "see you back in the triple nickel" instead of "at XXX point, contact NY on frequency 5550")*

*EIDW: Local "Slang" is often used on the radio and clearances often include excessive information. LIRQ: Very poor English both spoken and undertood by many controllers. LFPG: Use of French in such a busy airport often causes loss of situational awareness with regards to other traffic.*

*Poor command of English is at the root of non-standard phraseology.*



➤ **Readback:**

In six percent (6%) of the observations, a readback error was cited, and Pilots often felt that their readback was not listened to. Sometimes an incorrect readback was made by the Pilot and was not detected by the Controller. Pilots indicated that they needed an acknowledgment to their readback to close the communication loop. At times, they were told not to readback the clearance but to just listen and this was not acceptable in the opinion of the survey respondents. Examples of quotes from the survey with respect to readback:

*When ATC gives clearance during flight that involves speed, hdg and FL all in the same sentence followed with break/break. One of the numbers often gets wrong and there is no read back to verify. Exp. speed 250 hdg 250 level 150 break/break;*

*There is no need to do readback, and if you insist to do readback, they don't correct you if you make a mistake.*

*Sometimes pilot's or atc don't give the read back and don't correct them.*

ICAO Annex 11 para 3.7.3.1 requires “Flight Crew shall read back to the air traffic controller safety-related parts of ATC clearances and instructions which are transmitted by voice”<sup>8</sup>.

ICAO Annex 10 – Volume II and PANS ATM (Doc.4444) provide rules and procedures for Pilot / Controller communications:

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

Para 5.2.1.5.3: Speech transmitting technique should be such that the highest possible intelligibility is incorporated in each transmission. Fulfillment 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
- c) the writing process. A slight pause preceding and following numerals makes them easier to understand;
- d) maintain the speaking volume at a constant level;”

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<sup>8</sup> ICAO Annex 11 Air Traffic Services



## ➤ Transition altitude\ transition flight level

The climb performance of some aircraft has increased tremendously over the years and the resulting climb rate can create a situation where the aircraft reaches the transition altitude very soon after takeoff.

Some regions have a variable transition altitude depending on the ambient atmospheric pressure. Globally transition altitude may vary from 3,000 to 18,000 feet, with some countries changing the altitude daily. Adding to this complexity is the use of meters instead of feet to designate altitudes as well as the use of height based on QFE in some parts of the world.

Many newer aircraft types have a flashing altimeter setting or similar 'attention getter' when passing the transition altitude or transition level, which is programmed in the database of the Flight Management System (FMS) and modifiable by the pilots. However, variability in transition altitude creates a potential disagreement between the actual transition altitude on the day and the altitude that is programmed in the FMS database or manually inserted. The result may be a flashing reminder at the wrong altitude or other errors due to changes in the transition altitude.

Examples of quotes from the survey with respect to transition level and altitude:

*Transition altitude/flight level should be more consistent worldwide;*

*The low transition altitude causes high workload down low, also opens up the 110 / 100 problem. Why not lift the transition altitude to 10,000 feet and level to FL110 in all countries where it is currently below 10,000 feet;*

*Transition altitude is different in every country. Why can't there be a worldwide standard altitude where this happens.*

## ➤ Cleared for the approach

Some pilots have expressed concerns when "cleared for the XYZ approach" when the aircraft is still above the altitude at which the approach procedure commences. In some cases, this clearance indicates that the aircraft can descend to the published approach altitude, whereas in other countries the aircraft is required to maintain its present altitude until it intercepts the glide slope or further descent clearance is given. Clearly the lack of consistency



across the world creates a threat at a time that can be very busy for a crew. The following quote is a typical example:

*ATC give specific descent altitudes in the approach phase. These are frequently not in accordance with the approach plate minima (higher) which is acceptable but then they clear you for the approach. In order to complete the approach further descent is now required. This frequently leads to ambiguity as to which altitude is acceptable to ATC. I believe that clear for the approach means clear to complete the approach in accordance with the procedure and using the stated altitudes. This is however often unclear and leads to additional RT to clarify and sometimes delay in descending which can lead to stability issues especially during NPA.*

*Glide intercept altitude is 4000ft. Pilot have clearance to follow STAR (STAR MEA is 5000 then 4000) and have clearance for ILS approach with last cleared altitude 8000ft. May pilot initiate further descent according to STAR and intercept glide from 4000ft or he must be at 8000 ft? Does ATC must emphasize to descent according to STAR?*

*At 6000ft on approach, "start descend for (!) thousand feet"*

### ➤ **Metric Altitude**

Pilots complained that the non-standard use of meters rather than feet to denote altitude increased risk because even with new aircraft having both measurements they needed to use an alternative source of information, such as a plasticized card with meter to feet conversion tables. In many aircraft, meters are not displayed requiring Pilots to convert meters to feet, and then set the altitude window (in feet) to meet the required metric altitude or level. Some modern aircraft have this capability through a meter/feet selection button. It was also noted that the useable flight levels vary from one adjacent country to another, requiring altitude adjustments when crossing the border. For example: China and Russia have different useable flight levels but similar enough that if the required change is not completed it could result in loss of standard separation. Further adding confusion is the fact that vertical speed indications remain in feet, even when climbing or descending between metric altitudes.



Pilots' comments from the survey are provided below:

*A major threat that increases cockpit workload significantly is the use of METRIC altitudes when climbing and descending (as opposed to during cruise) especially at QFE airports where a conversion needs to be done between QFE Meters by ATC to QNH Feet for Aircraft systems;*

*I would prefer altitude clearances to include the word "altitude", e.g. "descend to altitude 9,000 feet". SID clearances to altitudes above published SID constraints would be clearer if they included the word "unrestricted". The problems caused by use of metric Flight Levels are mitigated in my company by robust standard operating procedures and the use of a metric conversion card. However, FLs in China involve a metric level, but ATC frequently require a rate of climb / descent in feet per minute. Mixing two measurement units is not ideal.*

*On very busy and difficult to understand frequency we were cleared to descend to FL 9800 meters using more than 2000 fpm rate of descent. Mixing units in a same clearance is common occurrence.*

### ➤ **Altitude/Speed Constraints**

If a crew was given a speed or an altitude restriction, it was not always clear if that restriction was still valid when a subsequent clearance was provided. Clarification was often required, creating more congestion on the frequency, often adding to an already busy frequency.

*It is common when getting speed restriction that it is not clear if the restriction is still valid when transferred to a new controller;*

*Speed restrictions on arrivals also remain a source of confusion among controllers despite the guidance the AIM provides (example: Airline ABC, max forward speed when at 12000 feet with a cross fix xxxxx @ 210 kts 10 miles ahead. Does that void the STAR speed restriction? It's not an expect, its a cross "at"; but ATC just said max forward. Had they said, max forward speed and void the speed restriction at XXXXX, that would be clear, or max forward speed but cross XXXXX at 210 kts, that would be clear; but they rarely do this, and then confusion reigns.)*

### ➤ **Taxiing over a red stop bar**

Red stop bars are installed at many airports to identify the entrances to active runways. A number of reports noted that Flight Crews were instructed to cross



illuminated red stop bars, creating confusion and additional radio conversations. In the survey, it was reported more than once that ATC in MENA region often clear the aircraft to 'cross the red stop bar' at a runway holding point rather than switching the lights off. Some Pilots also indicated that even after asking the lights to be extinguished their request was denied and that they were told to line up.

Pilots' comments from the survey are provided below:

*There is a tendency for ATC to clear aircraft to taxi through red stop bar lights onto active runway. If ATC doesn't get a read back because of frequency congestion they will get into a lengthy discussion with the specific aircraft crew about their lack of response when in fact no one can hear the clearance due to multiple transmissions at the same time (ATC and other aircraft);*

*At a certain airport, the red stop bars at the holding point rwy 33L cannot be switched off therefore pilots have to cross a red stop bar all the times. This practise is very dangerous and has already been reported many times but so far with no effect.*

*Clearance to Take off or to cross an active runway with a red stop bar still illuminated (no LVP in force)*

*Approaching a Red "stop" bar whilst taxiing, a request to cross is made, and the aircraft cleared. But the bar remains red. The runway is active. A further request is made... "cross the red" will normally be the response... But not always. Gets confusing, especially whilst crossing an active runway.*

*Notam and ATIS: Stop bars are ON for maintenance, some understand that they can cross when cleared to lineup for example*

*ATC clearing you to cross a runway with stop bars (red) on, and instructing you to disregard the lights.*

*Not using line up and wait behind clearance, also lots of airports do not exercise the Red stop bars and are left on when cleared to line up due to laziness of tower staff.*

*Cleared to cross the runway hold short red lights (this is very frequent) some airlines reply that by their sop they are not allowed to cross any red bar. This seems to be the only way for them to switch those lights off when receiving clearance for line up or to cross an active runway.*

*When ATC give clearances to be execute after a while, like "clear to cross after the ACFT on 3 nm final". They always forget the stop bars and we have to ask them again.*



The following information extracted from ICAO Doc 9870 AN/463 Manual on the Prevention of Runway Incursions First Edition 2007<sup>9</sup>:

#### “10. STOP BARS

The following extracts from ICAO Standards and Recommended Practices are provided to assist flight crews in understanding the use and application of stop bars: Annex 2 — Rules of the Air, Chapter 3: “3.2.2.7.3 An aircraft taxiing on the maneuvering area shall stop and hold at all lighted stop bars and may proceed further when the lights are switched off.”

This lack of harmonization with ICAO SARPs degrades global safety, as it may lead to flight crews crossing illuminated stop bars that are functioning as the last safety barrier.”

#### ➤ **Route clearance while taxiing**

In some countries, it is a common practice to receive the en-route clearance while the aircraft is taxiing to the runway. Some Pilots feel that risk increases when they have to divert their attention from taxiing the aircraft to copying and reviewing the route clearances. Also, the Pilot taking the clearance is effectively out of the loop for the taxi sequence which in itself contains multiple threats.

*ATC Route clearance at some airfields are given during taxi out and more often than not, as the pilot is lining up with the "takeoff clearance"*

*Certain airports in the Caribbean on Int'l flights use clearance delivery and ground control frequencies for engine start requests and taxi instructions. Then, they wait to issue the flight's clearance on tower frequency. At certain very busy airports, this practice seems to divert the tower controllers attention away from the arriving and departing aircraft in the immediate vicinity of the airports*

Controllers should not transmit to an aircraft during take-off, initial climb, the last part of final approach or the landing roll, unless it is necessary for safety reasons, as it may be distracting to the Pilot at a time when the cockpit workload is at its highest<sup>10</sup>.

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<sup>9</sup> ICAO Doc 9870 AN/463, Manual on the Prevention of Runway Incursions

<sup>10</sup> ICAO Doc 9432 AN/925, Manual of Radiotelephony, Fourth Edition 2007



## ➤ Other Communication Problems

Pilots reported that they themselves need to be more disciplined and use standardized phraseology, especially in busy centers and when more than one language is used.

*Poor radio discipline throughout leads to congestion/interruptions/repeat instructions /repeat information/delayed descent clearances and on and on;*

*Long airway and taxi clearances were given. No radio discipline. Everyone keeps blocking each other. This is very specific to certain airspace.*

*Poor RT discipline is the biggest threats, including the use of dual language. At CDG, I was nearly involved in a ground collision during pushback when my pushback clearance was cancelled in favour of another aircraft. The cancellation was given in French, which neither I nor my colleague understood. Although we did not acknowledge the cancellation, the other aircraft was cleared to push from the stand next to us. When I noted both of us moving at the same time something obviously wasn't right so I told my tug-team to stop pushing until I had resolved the situation.*

*There are so many, I could write a book. And a very thick one at that. Its quite shameful that apparent professionals can have such poor discipline. Eg being told to cross stopbars, being issued altitude clearance without callsign, being issue tracking deviations and clearances without callsign, having altitude constraints ignored without being cancelled, being ignored on the radio when inconvenient to reply, being continually stepped on by pilots not listening out, being issued non standard terminology clearances with local words inserted etc etc etc.....*



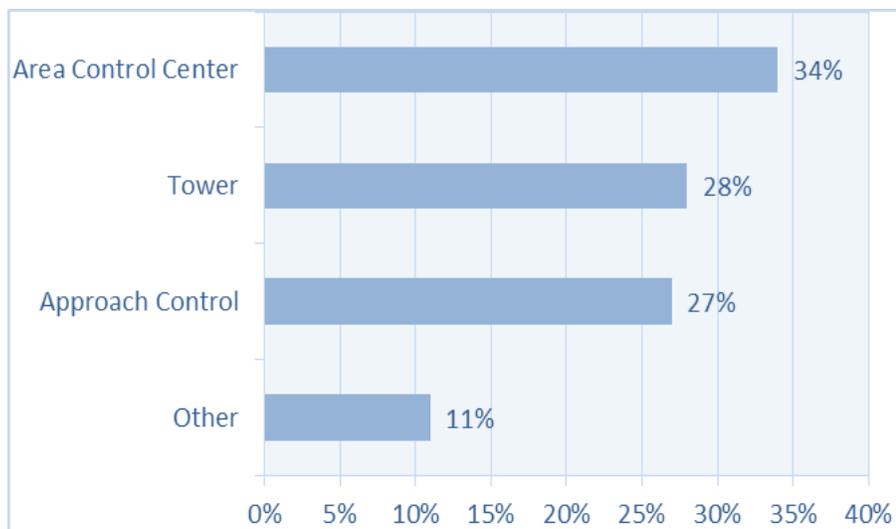
### 3. ATC SURVEY ANALYSIS

The International Air Transport Association (IATA) and the International Federation of Air Traffic Controllers' Associations (IFATCA) worked together in requesting Air Traffic Controller participation in a ten (10) minute on-line survey regarding phraseology issues, especially in international operations. IFATCA was involved in supporting the 11 question survey and in encouraging member participation.

This section presents the analysis of 568 responses related to phraseology and communication problems. Survey responses are anonymous and cannot be traced back to the originator. The goal was to gain insights on safety threats related to communication and to itemize the issues identified. Because the Threat and Error (TEM) model is not routinely used in the Air Traffic Management (ATM) world, this survey used the term "Challenges." A challenge in this context can be the precursor for error and if the Challenges are known, they can be eliminated or mitigated. Reducing the number or magnitude of these challenges thereby reduces the possibility of operational errors.

#### 3.1 SURVEY ANALYSIS

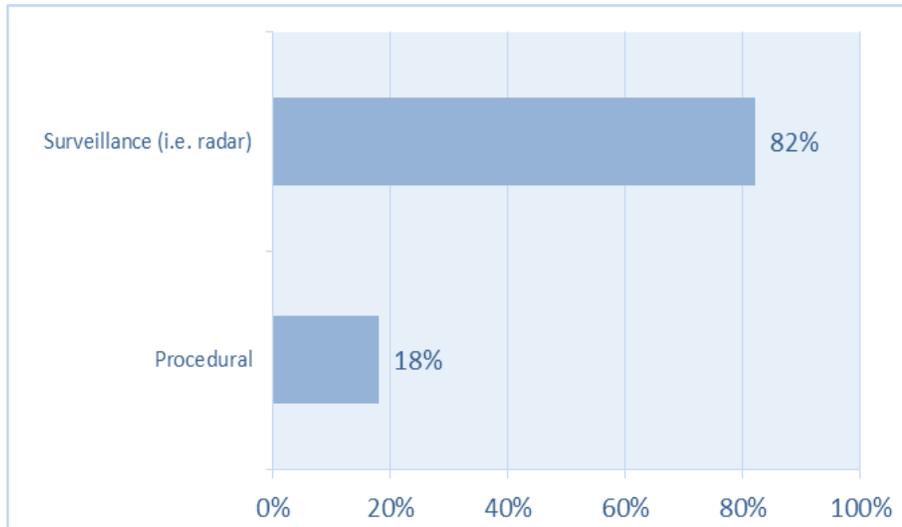
**Question 1, 'What is your primary job focus?':** The functional area of participating Air Traffic Controllers is presented in three main categories: Area Control, Control Tower and Approach Control. 34% worked in the Area Control Center, 28% were in the Control Tower and 27% were in Approach Control. 11% worked in other locations, which included experience in both Tower and Approach Control, flight information, Safety department, etc.



Question 1: What is your primary job focus?

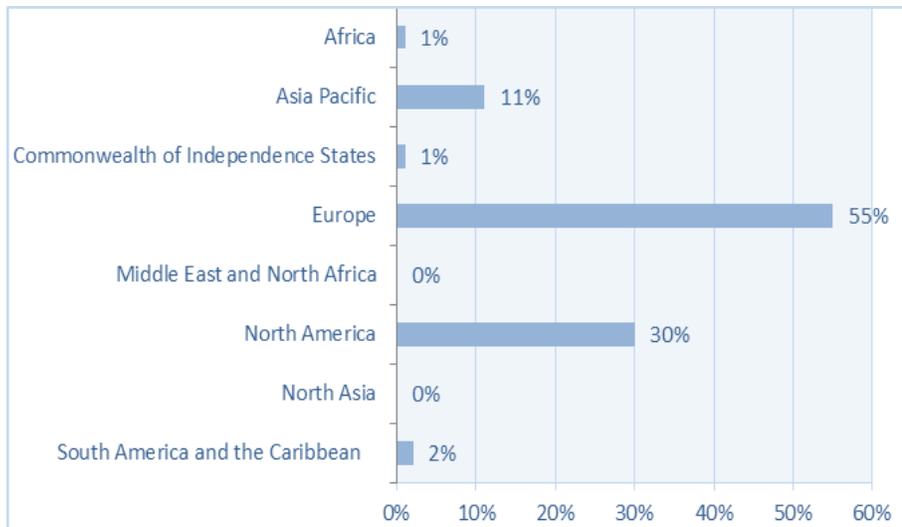


**Question 2, 'What separation standards do you use most?':** Responses showed that 82% of the Controllers operated to surveillance separation standards and 18% used procedural control.



Question 2: What separation standards do you use most?

**Question 3, 'I am based in...':** The region of operation for the group of respondents had to be taken into account when later drawing conclusions from the survey. The representation was sufficient from certain regions, with 55% being based in Europe and 30% based in North America; however, there was a lack of participation from other regions and therefore the responses to the questions should be reviewed from this perspective.

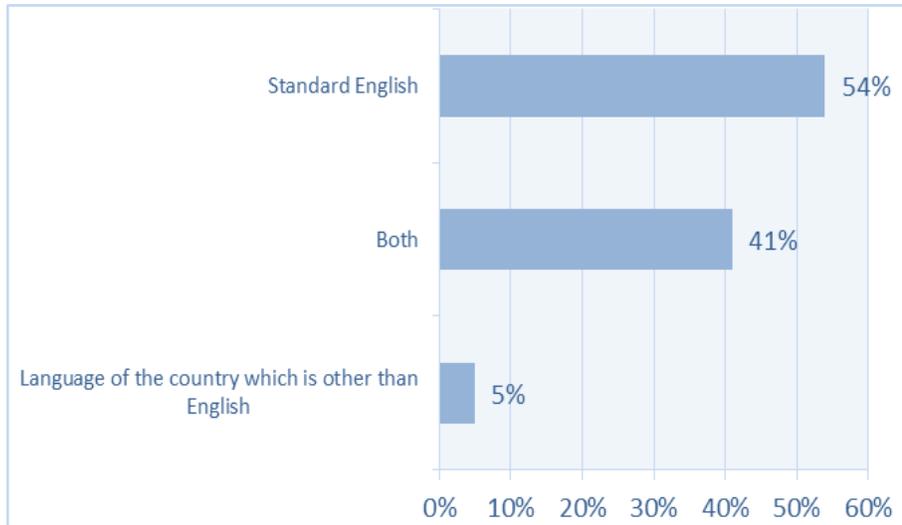


Question 3: I am based in



**Question 4, 'If I am based in a country where English is not the mother tongue, what language is used to communicate?':** This question aims to identify the use of native languages in aviation communication. The results indicated that 46% of respondents reported using a language other than English to communicate at certain times.

Figure 4 below shows the combined percentage of Pilots and Controllers, who commented on the use of a language other than English to communicate at certain times.



Question 4: If I am based in a country where English is not the mother tongue, what language is used to communicate

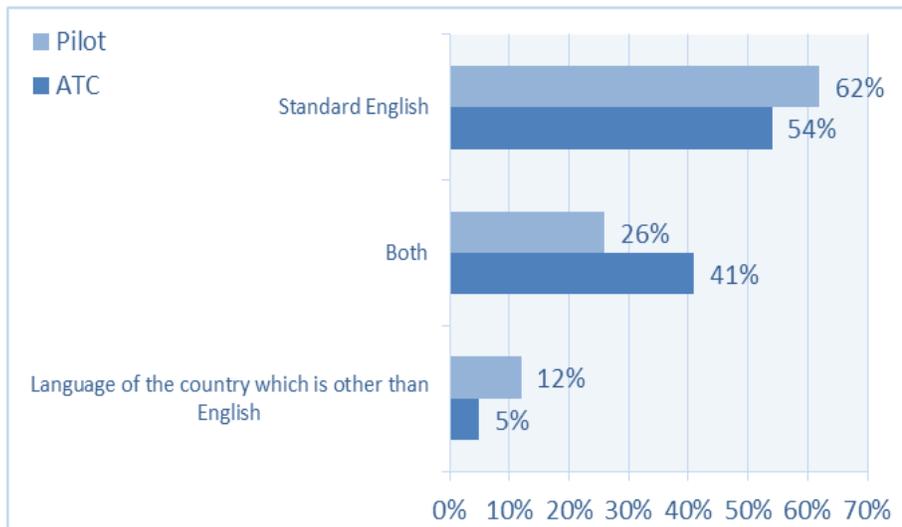


Figure 4: Percentage of pilots and controllers giving feedback on the use of a language other than English



**Question 5, ‘How often are you in the situation where ICAO standard phraseology is NOT used?’:** Respondents indicated the frequency with which they experience communications where ICAO standard phraseology is not used. The majority of Air Traffic Controllers (52%) encountered this problem at least daily and a further 25% reported that they encountered it at least weekly.



Question 5: How frequently are you in a situation where ICAO standard phraseology is NOT used?

Figure 6 below compares the Pilot versus Controller reporting rates for non-standard phraseology (where Pilot rates are per flight and Controller rates are per day), with a similar result noted between the two groups.

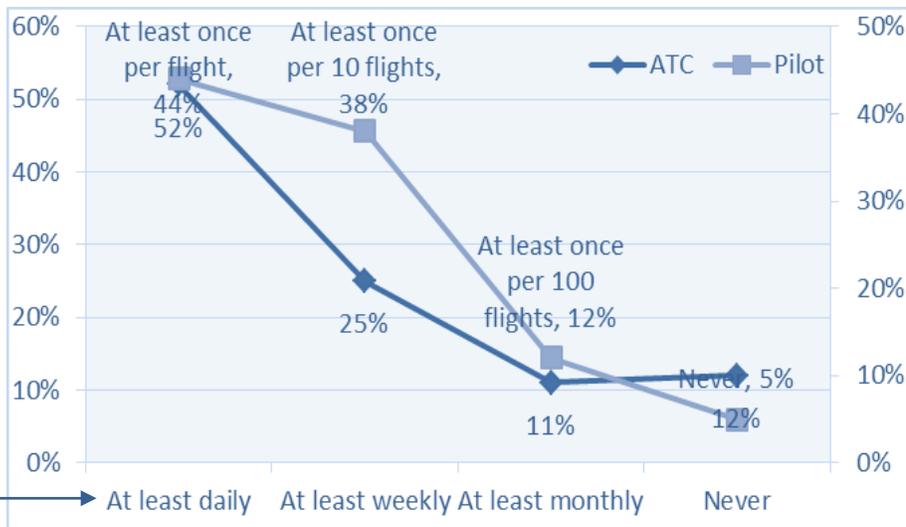
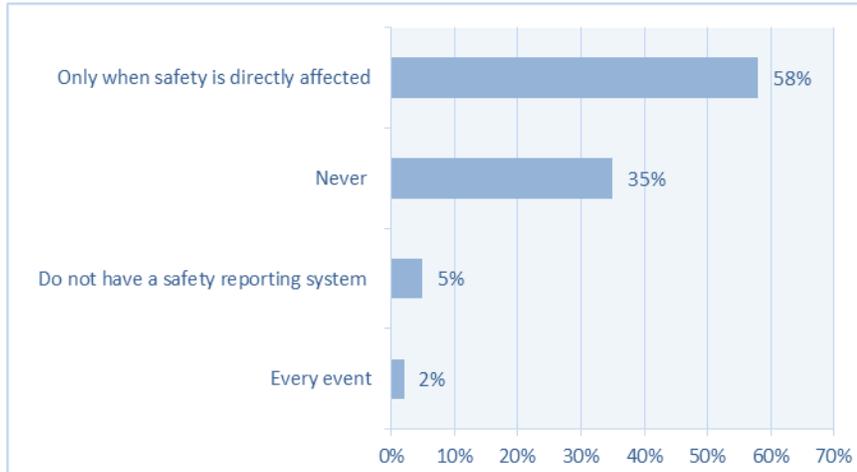


Figure 6: Frequency of communication problems with non-standard phraseology estimated by pilots and controllers



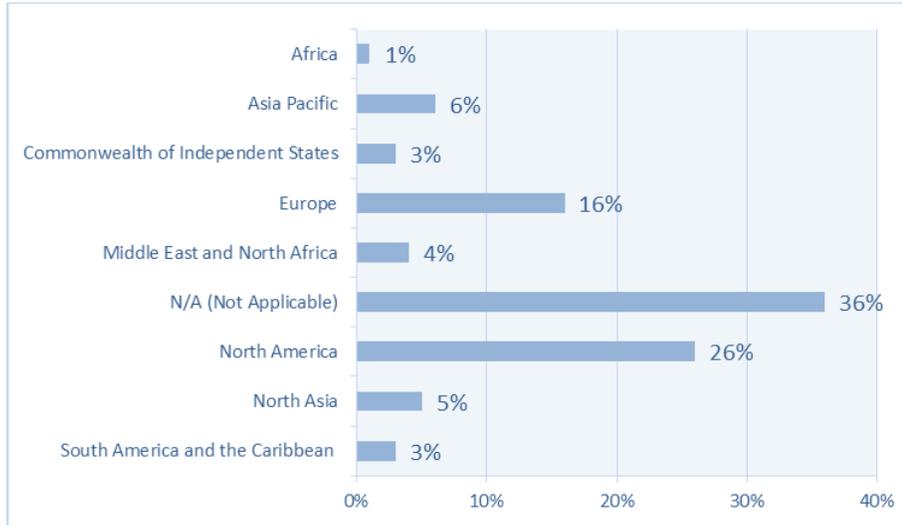
**Question 6, ‘How often do you report in your safety reporting systems events where ICAO standard phraseology is not used?’:** 58% of the respondents formally reported communications issues only when they have had actual safety consequences. A very small number, two percent (2%) said that they report every event, whereas 35% indicated that they never report this type of event. Of concern was the five percent (5%) of respondents who indicated that they do not have a formal reporting system in place.



**Question 6: How often do you report in your safety reporting systems events where ICAO standard phraseology is NOT used?**



**Question 7, ‘Specify the originating region that most often airline operators are from which do NOT use ICAO standard phraseology’:** This question illustrates that Controllers most often experience an event where ICAO standard phraseology is not used in communications by Flight Crews originating from certain regions. The survey revealed that North America (NAM) had the highest percentage with 26% followed by Europe with 15%.



**Question 7: Specify the originating region that most often airline operators are from which do NOT use ICAO standard phraseology.**

Table 2 below illustrates the geographic distribution between the regions of the ATC respondents versus that of the Pilots who reportedly do not use standard phraseology. From the total 568 responses, 329 Controllers answered question 7 to indicate the origin of the Pilots involved. Analysis revealed that:

### **North America (NAM)**

138 Controllers out of 329 (41.9%) selected North American Pilots when responding to the question. Of that group 74 (53%) were European Controllers and 56 (40.5%) were North American Controllers. The other 8 responses were Asia Pacific, LATAM and African regions. As in the Pilots’ survey, responses suggest that Controllers are more critical of their own region’s counterparts.

### **Europe (EUR)**

83 Controllers out of 329 (25%) selected European Pilots when responding to question 7. Of that group 81 (97.5%) were European Controllers. The other two (2.4%) Controllers were from Asia Pacific.



## Asia Pacific (ASPAC)

33 Controllers out of 329 (10%) selected Asian Pacific Pilots when responding to question 7. Of that group 13 (39%) were Asian Pacific Controllers, 11 (33%) were North American Controllers while 9 (27%) were Europeans controllers.

AFI, CIS, NASIA, LATAM and MENA Pilots were not mentioned in sufficient numbers to draw conclusion from the analysis of the data.

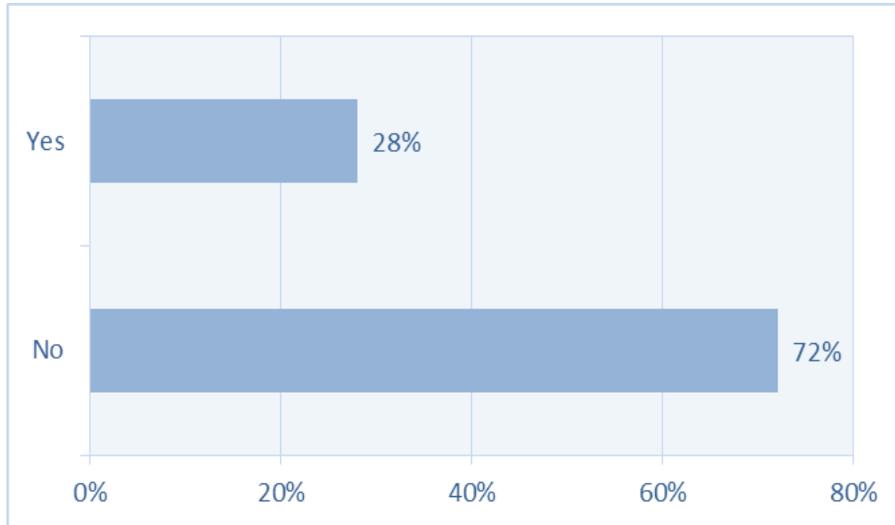
In summary, similarly to the Pilot's survey in which they indicated that a significant number of North American Controllers did not follow ICAO phraseology, Controllers selected the North American Pilots most frequently for not following ICAO phraseology. Both surveys thereby indicate trends for North America that should be acknowledged and acted upon by the appropriate authorities.

Pilots' Region	Reporting ATC Region							
	AFI	ASPAC	EUR	CIS	NAM	NASIA	SA	MENA
North Asia (NASIA)	1	4	16		5	1		
North America (NAM)								
Middle East and North Africa (MENA)		5	11		5			1
South America (SA)	1	2	1		11		3	
Europe (EUR)		2	84		5			
Commonwealth of Independence States (CIS)								
Asia Pacific (ASPAC)		12	9	1	11			
Africa (AFI)	2	1	3	1				
N/A	1	20	101	2	70		5	1

**Table 2: Geographic Region distribution between the regions of the respondent versus the Pilots that use non-standard phraseology**



**Question 8, 'Is there a specific phraseology (standard or non-standard) routinely used that creates confusion?':** 28% of the survey respondents indicated that there were specific conditions which could be a source of confusion and misunderstanding in communications. Examples are provided below the graph.



**Question 8: Is there a specific phraseology, (standard or non-standard) routinely used that creates confusion?**

The following quotes are typical examples:

*The main problem in the USA is where FAA phraseology differs from ICAO and an International operation (crew) is involved. Expect clearances are too often taken for an "official" clearance. This means more frequency congestion as clarification is required.*

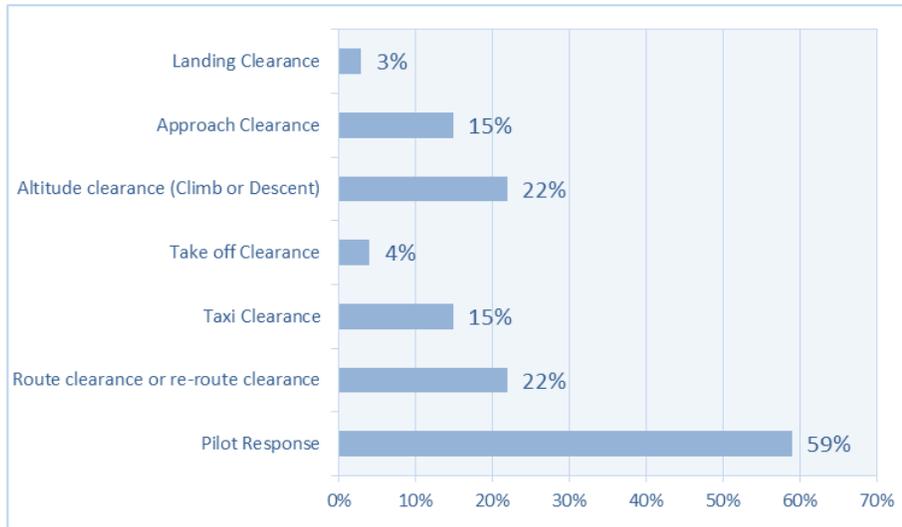
*Any phraseology relating to an aircraft on an RNAV arrival or departure. Climb and maintain, and descend and maintain are no longer understandable by most pilots. Delete speed restrictions is also very confusing.*

*Altitude readback, not stating flight level or thousand, just saying 260 "two, six, zero" Can easily be confused with headings*

*The phraseology for a time based climb clearance seems to always cause confusion.*

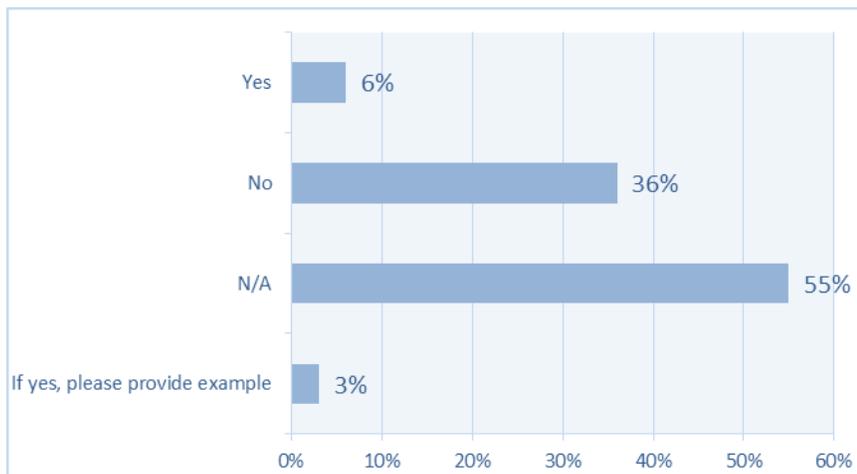


**Question 9, ‘In what situation does this typically occur (which phase of flight)?’:** 59% of respondents indicated that Pilot response to an ATC communication was the most common area of confusion.



Question 9: In what situation does this typically occur (e.g. which phase of the flight)?

**Question 10, ‘Are you aware of misunderstandings/interpretations or common errors made when using CPDLC?’:** Survey respondents indicated that there were no apparent problems in the usage of Controller Pilot Data Link Communications (CPDLC). Very few specific comments were made but the need to use standard phraseology in CPDLC free-text messages was identified.



Question 10: Are you aware of misunderstandings/interpretations or common errors made when using CPDLC?



**Question 11: 'Is there a procedure or a common practice used by pilots or ATC that creates a safety concern? Is there a local phrase that is often misunderstood?':**

To the question about procedures or practices that were problematic, the controllers provided the following information:

- Controllers' responses indicated that the lack of proper readback by Pilots was their greatest concern. Incorrect readback, incomplete readback, and not using their callsign are the most mentioned issues. Pilot failures to use proper callsigns were mentioned 30 times out of the 175 comments for this question. In comparison, the issue of similar callsigns was only mentioned five (5) times.

*Not using a call sign in the read back happens hundreds of times a day. Sometimes it is more critical than others. Nevertheless, it should NOT be acceptable.*

- Pilots' failure to request a reduced speed when a specific speed was assigned (mainly on downwind) occasionally caused loss of separation. When questioned, Pilots indicated that they have to comply with company procedures regarding airspeed. However, they frequently did not advise the Controller who would not be aware of company procedures. An example of comments made by Controllers:

*We have a problem with pilots reducing speed even though they were given a specific speed. This does occasionally result in loss of separation with trailing aircraft. This does often occur on downwind/base/final and with British/Chinese/Eastern European airlines.*

*Some flights do not comply with clearances to reduce or increase speed while are vectored. They say that they are complying with company rules, and i am not familiar with company rules. So what should i do?!!*

*Different company policies not allowing all of the pilots in the system to fly the airplanes more standardized. I.E. Lahso, speed on departure and speeds on final etc.....*



- SID's and STAR's routinely create issues for Controllers. Example of Controller comments:

*I give a climb and maintain clearance to an altitude. This cancels any altitude restrictions on a SID. Pilots don't climb and ask if they have to comply with the SID. Busy ATC facilities make up none standard phraseology to avoid these question and pilots think this is standard.*

*Clearing a commercial airline pilot on departure to an altitude above the restrictions on a SID and getting a questionable readback on altitude restrictions published on the SID from the pilot.*

*U.S. pilots frequently question whether a new altitude assignment on a SID automatically cancels the crossing restrictions, taking up valuable frequency time. Some controllers have resorted to changing their own phraseology to include "cancel altitude restrictions" thinking they are helping. It is my belief that by EDUCATING pilots to understand the correct interpretation of the phraseology we can eliminate this confusion. Instead, we are using our "own" phraseology, creating a situation where now we are making pilots think that controllers HAVE to say "cancel altitude restrictions" in order to cancel them. U.S. air carriers also frequently "chip" on the arrival sector, thinking they are helping us, offering that they 'have traffic in sight and can follow it,' asking for their sequence, wanting to know why they have to follow slower traffic, etc...again, taking up valuable frequency time. Especially on arrival sectors, pilots should be more attentive to the frequency and instructions instead of trying to "assist" controllers by chatting on the frequency.*

*When an aircraft following SID/STAR and cleared TO some level, pilot should not ask whether any level or speed restrictions unless i am removing the restrictions, as it is inbuilt in the system of SID/STAR, when situation arises i can remove the restrictions and pass it on to the concerned aircraft*

*Climb now FL100, when SID restriction of 6000'. Is that unrestricted/SID cancelled?*

*After taking off, aircraft call approach. They are initially cleared to climb to FL120. I re-cleared them to climb FL190. They are supposed to comply with the SID, but nearly 90% of them say "I understand to climb FL190 UNRESTRICTED" and I just told them to continue to climb, nothing else*



## 4. CONCLUSION

The conclusions in this section have been drawn from the analysis of responses and recommendations provided by Pilots and Air Traffic Controllers in the survey questionnaire. The following factors have been identified as contributory to Pilot - ATC communication errors:

Operational factors which increase the likelihood of communication errors include:

- Non Standard Phraseology
- Rate of speech delivery
- Use of general aviation English in lieu of standard phraseology
- Use of slang
- Ambiguity in general aviation language
- Lack of Harmonization

Other factors which compromise human communication include:

- Difficulty for some non-native speakers in pronouncing English vowel-based words including the phonetic alphabet
- Accents, including native English accents and strong English dialects
- Non-English speaker to non-English speaker communication

These factors are more difficult to address but may be remedied in part through training.

Many Pilots and Controllers believe that improvement of communication skill and discipline will help to reduce this issue. The aim of the recommendations in this section is to improve the quality of communication according to the survey respondents.

ICAO Annex 10 Volume II, para 5.1.1: "In all communications, the highest standard of discipline shall be observed at all times."

The use of non-standard phraseology is a major obstacle to Pilots and Controllers effective communications. Standard phraseology helps significantly by reducing any ambiguities of spoken language and hence promotes a common understanding among people

- Of different native languages, or,
- Of the same native language but who use or understand words differently (e.g., regional accents or dialects).

Non-standard phraseology or the omission of key words may completely change the meaning of the intended message, resulting in miscommunication and potential traffic conflicts. For example, any message containing a number should include what the number refers to (e.g. a flight level, a heading or airspeed). Inclusion of key words helps prevent erroneous interpretation and allows for more effective read-back/hear-back.



Pilots and Controllers might use non-standard phraseology with good intentions; however the use of standard ICAO phraseology helps to minimize the potential for misunderstanding.

The most common phraseology problem for Pilots, was the fundamental difference between the North American phraseology “taxi into position and hold” (which has the same meaning as the ICAO standard phrase “line up [and wait]”) and the standard ICAO phraseology “taxi to holding position” (which means taxi to, and hold at, a point clear of the runway – ILS Cat 1, 2/3 etc). North American crew used to the terminology \*taxi into position and hold\* when instructed to \*taxi to holding position\* at times misunderstood the instructions for a clearance to enter the runway. To harmonize procedures, U.S. Department of Transportation, Federal Aviation Administration (FAA) has issued a Notice<sup>11</sup> concerning the harmonization between FAA and ICAO and to change from “taxi into position and hold (TIPH)” to “line up and wait (LUAW).”

This study aims to be a start in further opening lines of communication between Pilots and ATC, the States’ regulators and the Airline management teams of IATA carriers. It is hoped that it will provide momentum towards a greater harmonization of communications, procedures and common practices around the world.

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<sup>11</sup> U.S. Department of Transportation, Federal Aviation Administration, JO 7110.65T Air Traffic



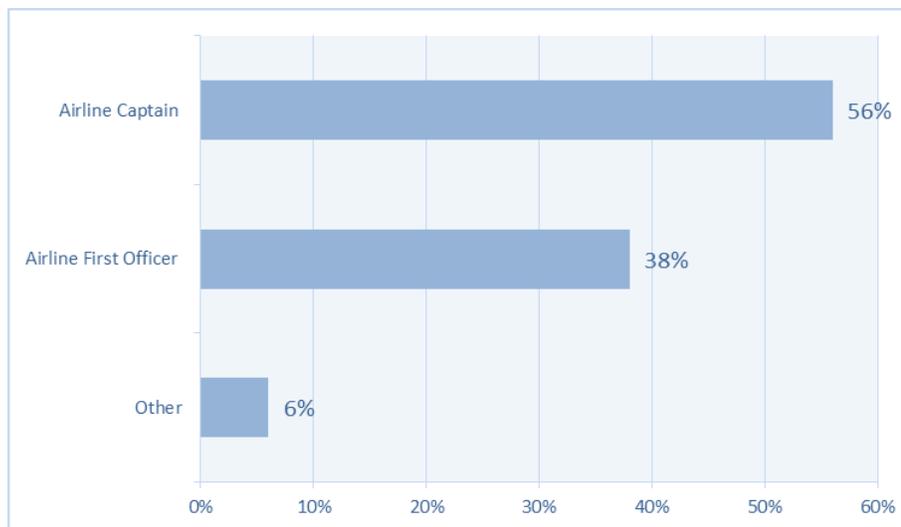
## 5. PILOT SURVEY ANALYSIS – Russian Translated version

It was notable that there was a reduced number of responses from both types of participants in regions where English was not the principal language. As a consequence, these surveys were translated into two other local languages in the hope of ensuring a broader scope of responses from all major regions of the world. This section presents analysis results of the translated version of the Pilot Phraseology Survey that was conducted in Russian.

The survey responses were very limited with only 143 respondents from Commonwealth of Independent States region. Almost all responses came from airline community. Hence Air Traffic Controllers survey analysis is omitted.

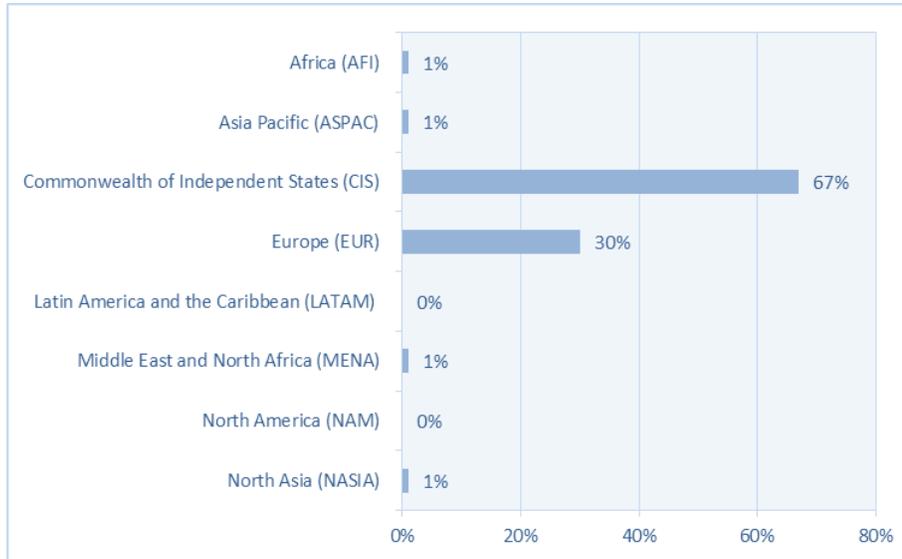
### 5.1 SURVEY ANALYSIS

**Question 1, 'I am an...':** The purpose of this question is to identify the current role of the individual completing the survey. It was notable that 56% were Airline Captains, 38% were Airline First Officers and 6% were others including Pilot instructors, flight engineers, radio operators, managers with pilot background etc... There were no set survey targets for either Captains or First Officers and this representation is quite adequate for the purpose of this study.



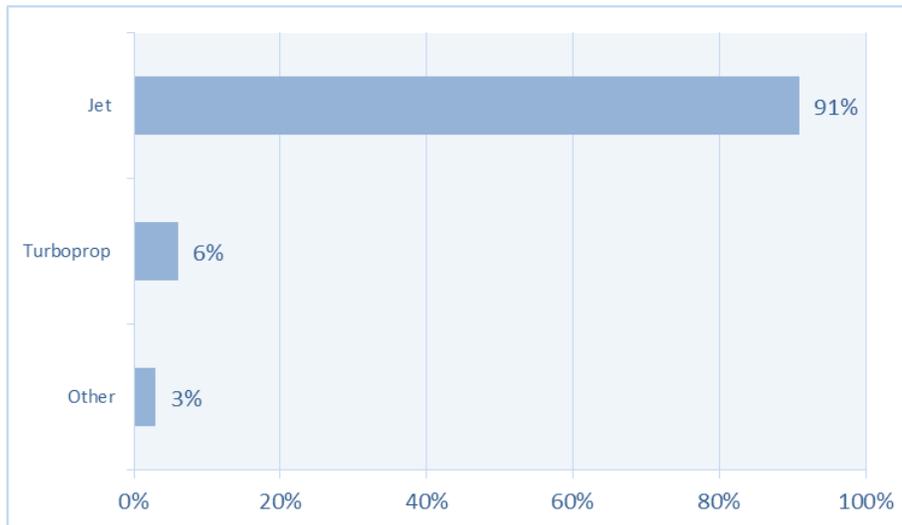


**Question 2, 'I am based in...':** The regional composition of the survey participants had to be taken into account when drawing conclusions from the survey. Due to the nature of the translated survey most airlines are based in Commonwealth of Independent States (67%) and Europe (30%).



Question 2: I am based in

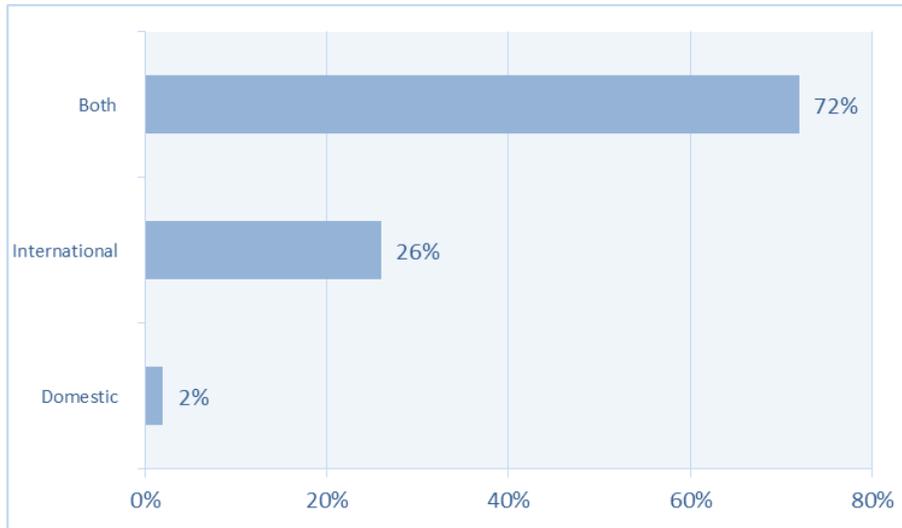
**Question 3, 'What type of aircraft do you mainly fly?':** This question identified the aircraft type of operation. This illustrates that the majority (91%) of the survey respondents were Jet Pilots. The "Other" category three percent (3%) was Helicopter Operators.



Question 3: What type of aircraft do you mainly fly?

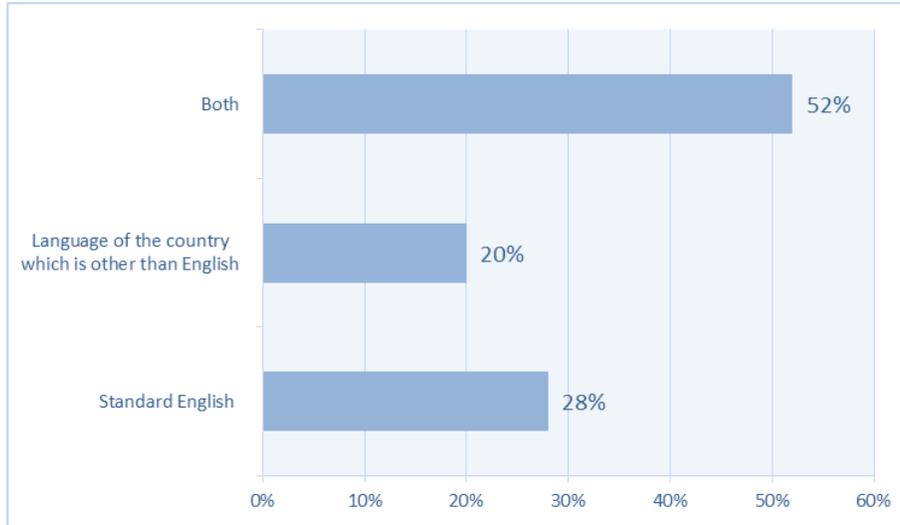


**Question 4, 'My flying is mostly...':** The group of respondents consisted primarily of Pilots who operated international flights. The targeted group was therefore very well represented with 98% of Pilots flying internationally or both international and domestic.



Question 4: My flying is mostly:

**Question 5, 'If I am based in a country where English is not the mother tongue, what language is used to communicate?':** This question addressed the use of native languages in aviation communications. Due to the nature of the survey 72% of Pilots who responded used a language other than English to communicate at certain times. It is likely these same Pilots shared airspace with Pilots in other aircraft who had little or no knowledge of the local language. A consequence of a mix of languages is that flight crews who do not understand the native language may have decreased situational awareness. This information is an important element for the rest of the analysis which will be explained in more detail later.



Question 15: If I am based in a country where English is not the mother tongue, what language is used to communicate?

Some examples of responses from the Pilots survey:

*While entering or leaving the Moscow zone with high-density traffic, the ATC controller often switches from English into Russian. I have to ask to repeat instructions in English as I have a foreign captain in the cockpit. That takes time.*

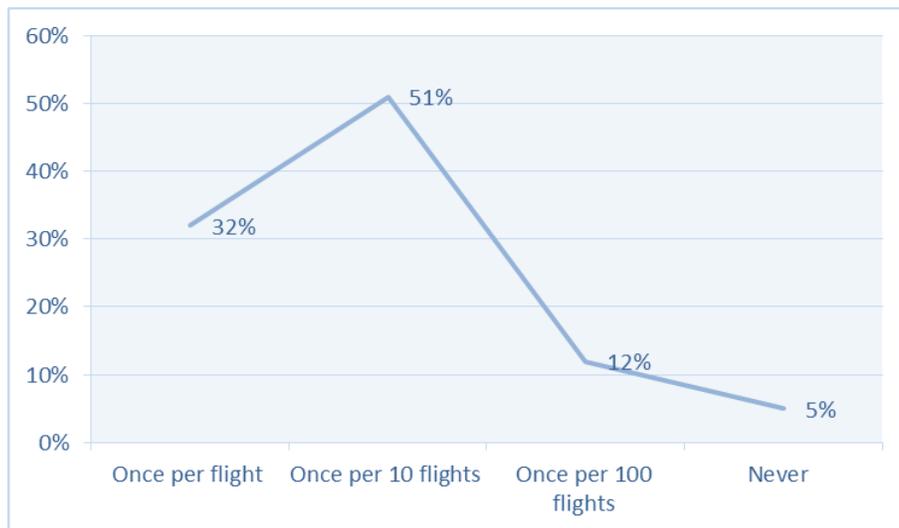
*Communication is being held in English language and ATC controller switches into Russian.*

*Mixed usage of phraseology in English and in Russian*

*AT Communication using different languages (ex. one aircraft using english, another - Russian)*



**Question 6, 'How frequently are you in a situation where ICAO standard phraseology is NOT used?':** The results of the survey showed the frequency with which Pilots experienced an event where ICAO standard phraseology was not used. 32% of all respondents indicated that they experienced this type of communication problem at least once per flight. 51% of participants reported that they encounter this problem once per ten (10) flights and 12% reported that they encounter similar issues once per 100 flights. However, five percent (5%) reported no experience in this type of communication problem.



Question 6: How frequently are you in a situation where ICAO standard phraseology is NOT used?

The top factors contributing to the occurrences involving non-standard phraseology were:

- The use of non-standard phraseology including ambiguous phraseology by Air Traffic Controllers was cited in 35% of responses. Some quotes extracted from the Pilots' survey



*Instructions to follow to the actuator is sometime by the name (Chelobitevo, Larionov, etc.) and not by two-letter code which takes extra time when making data FMGS*

*Lack of formal clearances (STAR clearance, APP clearance) for exit, approach and landing at the airports of the Russian Federation*

*Vectoring not by giving direction, but to the unspecified point. For example, "Proceed to final", "Direct to base". Vectoring using speed rate in Russia using terms "minimum speed" and "maximum speed". In some sectors, ATC defines ground speed for cruising aircraft.*

*Many stations use 'to' when command to climb or descend prior the new altitude or Flight Level figures without word 'FL' or 'altitude*

*"Cleared for ILS approach" doesn't mean cleared to intercept ILS, you have to maintain heading and altitude until you receive special clearance to intercept loc and descend on g/s*

*In case of declaration of emergency by crew, Controller shall first of all report aircraft position and time!*

*USA: total lack of standardisation, eg "taxi in to position RW..." instead of "Line up RW..."*

- Air Traffic Controllers' accent/slang, non-native and poor English were cited in 15%. The use of Russian and the use of slang by native speaking countries (US) were also cited. Some quotes extracted from the Pilots' survey:

*USA: Frequent usage of slang in phraseology, which greatly complicates the understanding between crews and ATC controllers*

*While entering or leaving the Moscow zone with high-density traffic, the ATC controller often switches from English into Russian. I have to ask to repeat instructions in English as I have a foreign captain in the cockpit. That takes time.*

*All ATS stations in France use local town names instead of waypoint names when they command shortcut procedure*

- Air Traffic Controllers giving multiple instructions combined with very rapid speech was cited in nine percent (9%). Examples of such factors quoted from the Pilots' survey are:



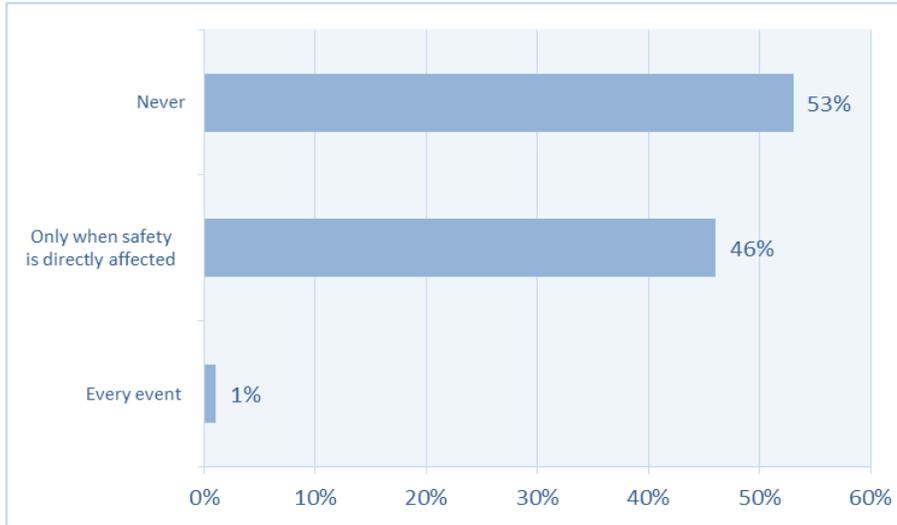
*Egyptian ATC controllers speak very fast. When requested to repeat become irritated and usually repeat more quickly. Often, after a request "say again" they change the whole sentence, giving new instructions*

*Excessive information given by ATC controller after having cleared STAR, distracting from the piloting and executing SOP during approach and landing in Russia, CIS and Asian countries. "Follow the third", "descend 600", etc. Obsolete reporting procedure for installing QFE altimeter settings. Clearance to capture ILS localizer is often omitted.*

*Russian phraseology involves a lot of unnecessary words (bearing, distance, took and maintaining flight level, pressure setting, etc.), after which follows necessary information (continuing climb, descend), during which time you may need to put the plane in horizontal movement. Rebalancing and discomfort for passengers, superfluous and unnecessary actions of the crew, which should be avoided!*

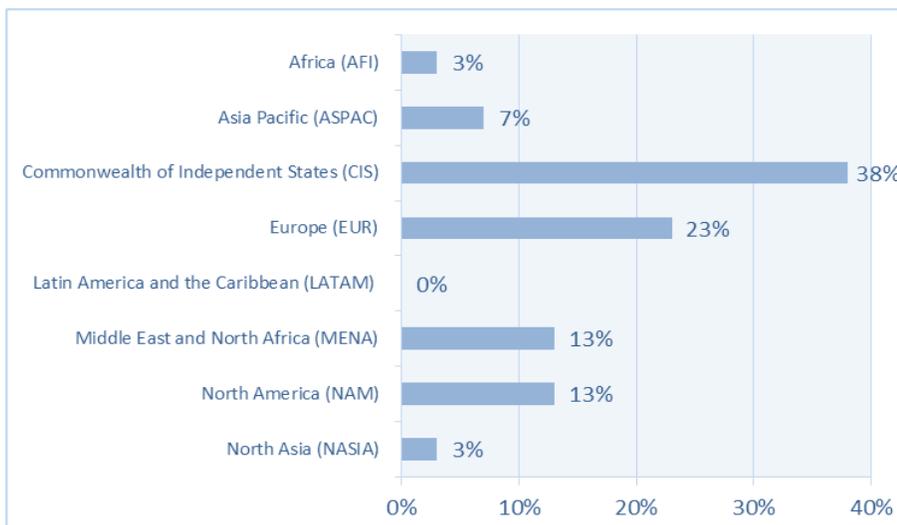
ICAO recommends maintaining an even rate of speech not exceeding 100 words per minute. When a message is transmitted to an aircraft and its contents need to be recorded the speaking rate should be at a slower rate to allow for the writing process.

**Question 7, 'How often do you report in your company reporting systems events where ICAO standard phraseology is not used?':** 46% of the respondents formally reported communication issues only when they encountered safety consequences. One percent (1%) of the respondents said that they report every event, and 53% of Pilots indicated that they never report this type of event. Therefore, 99% of the respondents do not formally report every event. A potential conclusion from this result is that these types of events are so common that Pilots do not see the need, nor the value, of reporting every event. The fact that 46% only report the higher risk events supports this conclusion.



Question 16: How often do you report in your company safety reporting systems events where ICAO standard phraseology is NOT used?

**Question 8, 'In what region do you most often experience an event where ICAO standard phraseology is NOT used?':** This responses to this question illustrated the regional distribution of Pilot experiences where ICAO standard phraseology was not used. Due to the nature of the survey focused on Russian speaking airlines, Commonwealth of Independent States (CIS) has the highest percentage 38%, followed by Europe with 23%, Middle East and North Africa (MENA) and North America (NAM) with 13% each, The fact that many participants indicated that they encountered an experience in a particular region should be considered in relation to their exposure and destinations.



Question 8: In what region do you most often experience an event where ICAO standard phraseology is NOT used?



It is worthwhile to compare the geographic distribution of the regions most affected in relation to exposure with the distribution of the region where the respondent's airline was based.

The region with the highest percentage of issues was CIS (38%), followed by EUR (23%). Figure 1 illustrates the region the respondent is based vs. the region in which they most often experience an occurrence.

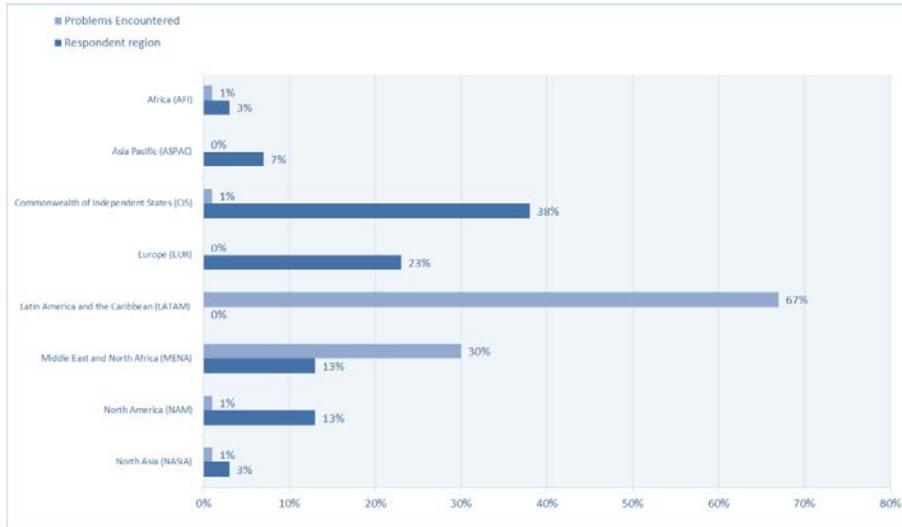


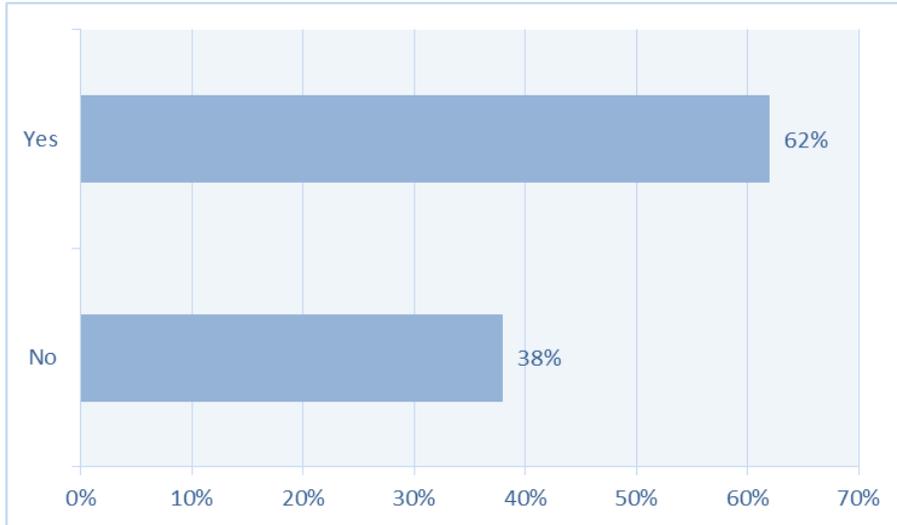
Figure 1: Respondent region vs. problematic region

The analysis shows that North American (NAM) Region had the highest number of complaints where ICAO standards phraseology was not being used from Pilots not based in the region. Another problematic area was MENA with the same complaints from Pilots based outside the region.

**Question 9, 'Is there an airport(s) where ICAO standard phraseology is not used?':**

The responses to this question indicated that 62% of respondents experienced events where ICAO standard phraseology was not used. The survey showed that many participants were of the opinion that in aviation communication, English should be the only language. A group of respondents remarked that at international airports the use of local languages should be minimized and possibly forbidden. The consequence of using a mix of languages, especially when flight crews do not understand the native language, may be decreased situational awareness.

In this question, if the respondent answered yes, they were offered a free text box to identify the airport which they felt presented them with the most threats from a communication point of view.



Question 9: Is there an airport(s) where ICAO standard phraseology is NOT used?

Figure 2 below represents the number of times a specific airport was identified by Pilot respondents as where it had happened more than once. Airports of Moscow zone (SVO, DME, VKO) were the airports most often identified. However, in almost all cases the airport was identified because of its use of the mix of English and a local language in Pilot communication and not specifically for its lack of ICAO standard phraseology. However for the airports JFK, ORD, IAD (all in the USA), the use of local phraseology or a term other than ICAO standard caused concern for many international pilots in the survey.

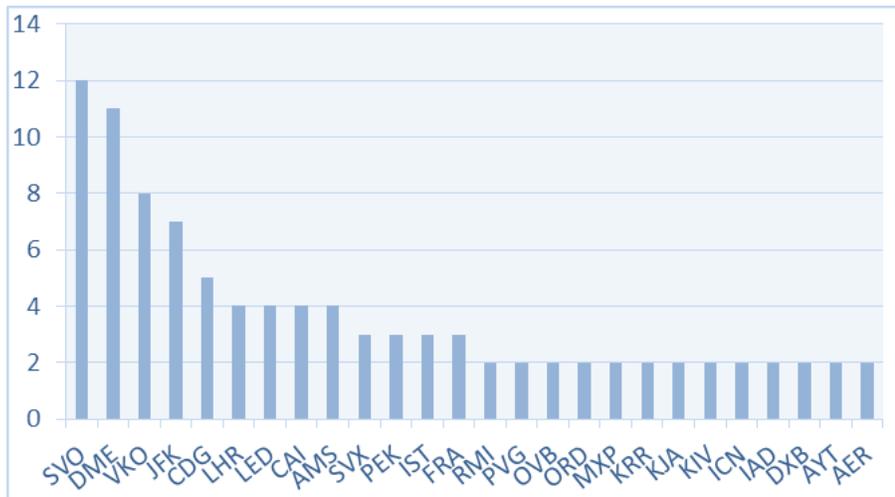
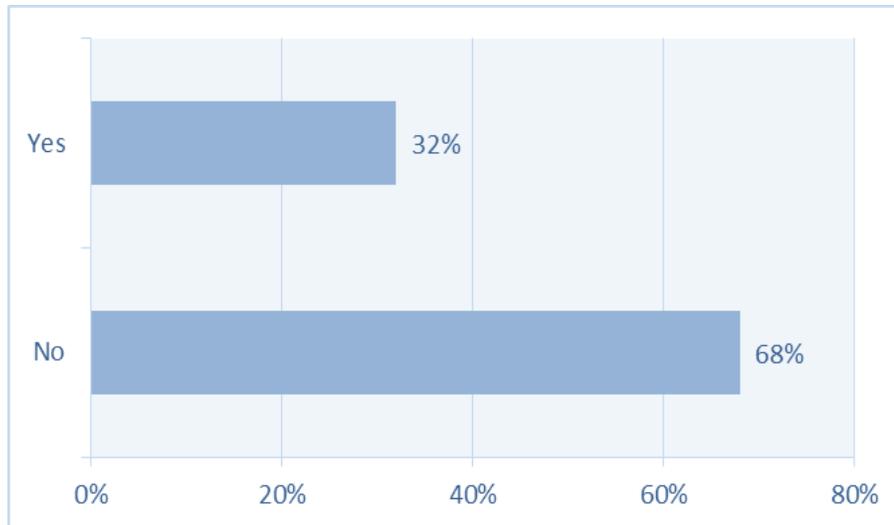


Figure 2: The airport(s) where ICAO standard phraseology is NOT used?



**Question 10, 'Is there a procedure or a common practice used by Pilots or ATC that causes misunderstanding or errors?':** 32% of the survey respondents indicated that there was a procedure or a common practice used by either Pilots or Controllers that created a threat of misunderstanding and errors.



**Question 10: Is there a procedure or a common practice used by Pilots or ATC that creates misunderstanding or errors?**

Pilots were given the opportunity to record the communication misunderstanding or procedures that can possibly create a threat for them in their day to day operations. For this question, each participant provided his/her own comments and suggestions, which can potentially be prejudiced by experience and exposure to certain types of communication problems.

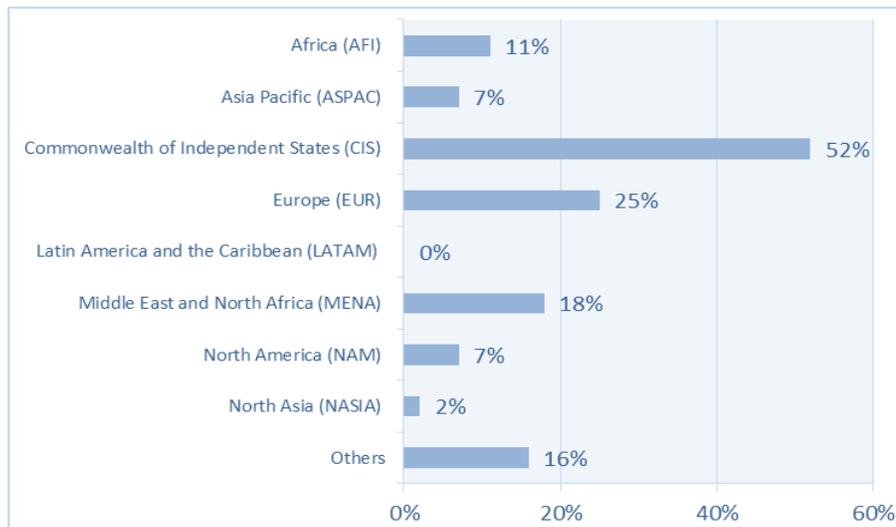
This section presents a summary of the most common remarks reported by Pilots in which they identified cases resulting in confusion, especially when frequencies were either congested or had a weak signal or static.

- Use of QFE altimeter settings for foreign crew used to QNH altimeter settings when landing was identified as a major possible threat in the CIS region although it is allowed by ICAO standards.
- The use of mixed languages between international crews speaking English with ATCs and the local crews speaking the country's language was by far the most common condition reported throughout the survey. Pilots indicated that this resulted in their situational awareness being degraded. They had difficulty deciding when to call without interfering in another crew/ATC communication. This issue was further compounded when the frequency was congested and may have led to crew 'stepping on' each other's transmissions.



- The lack of standardization in communications was the second most often reported condition and included comments such as the use of slang. This issue was most commonly noted in communications within the United States.
- For altitude changes, the use of the words TO (TWO) was noted as a contributing potential factor. The omission of 'flight level' in combination with the word "TO" could also cause a threat. (e.g., "cleared to one zero" when the correct clearance is "cleared to flight level one zero", which can be mistaken for "cleared two one zero (210)").

**Question 11, 'If you answer yes to Question 10, please identify the region in which the airport is located and describe the specific threat or misunderstanding':** The respondents had an opportunity (if their answer was yes to question ten (10) above) to identify the region where the airport was located.



**Question 11: If you answer yes to question number 10, please identify the region where the airport is located, and describe the specific threat or the misunderstanding**



Remarks from the Pilots' survey are quoted below:

*AT Communication using different languages (ex. one aircraft using English, another - Russian)*

*"Cleared ILS approach. RW." Some Russian ATC thinks that you have to maintain only the last given altitude and don't descend without command.*

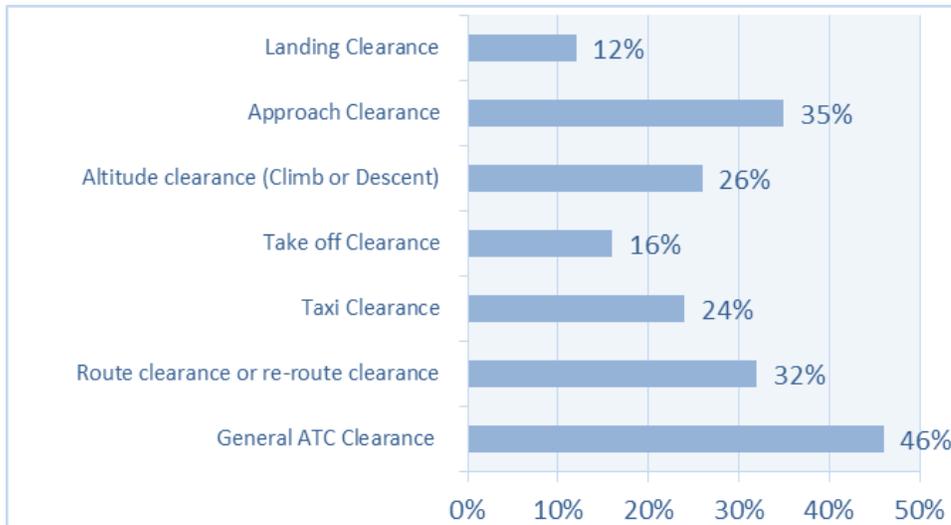
*USA: Frequent usage of slang in phraseology, which greatly complicates the understanding between crews and ATC controllers*

*While entering or leaving the Moscow zone with high-density traffic, the ATC controller often switches from English into Russian. I have to ask to repeat instructions in English as I have a foreign captain in the cockpit. That takes time.*

*All ATS stations in France use local town names instead of waypoint names when they command shortcut procedure.*

*Egyptian ATC controllers speak very fast. When requested to repeat become irritated and usually repeat more quickly. Often, after a request "say again" they change the whole sentence, giving new instructions.*

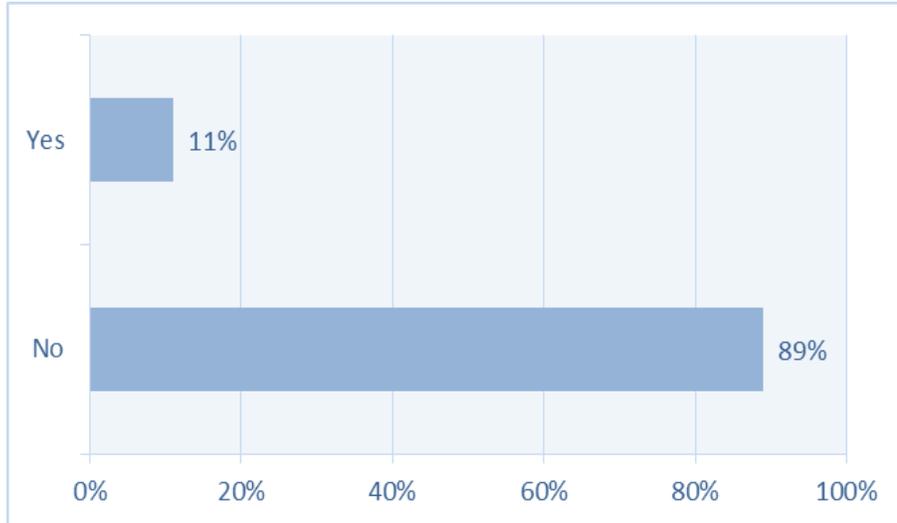
**Question 12 'In what situation does this typically occur?':** Respondents were able to choose more than one answer to this question, which was designed to allow flexible responses regarding the phase of flight. Taxi clearances seemed to be problematic for Pilots responding to the question.



Question 12: In what situation does this typically occur?



**Question 13, ‘Are you aware of misunderstandings/interpretations or common errors made when using CPDLC?’:** The vast majority of Pilots indicate from their experience that they do not encounter any difficulties with the use of Controller Pilot Data Link Communications (CPDLC). However, all those reporting an issue either showed lack of awareness about this type of application, or did not specify the issue at all.



Question 13: Are you aware of misunderstandings/interpretations or common errors made when using CPDLC?

**Question 14: ‘This question is more about practices that Pilots experience that are not always standard around the world thus creating a threat: Is there a procedure or a common practice used by pilots or ATC that creates a threat?’** This part of the survey was about non-standard practices that Pilots have observed around the world. In the survey questionnaire, respondents were able to cite and comment on procedures or common practices used by Pilots or Controllers that could possibly create a threat to the safety of a flight, especially for flight crews unfamiliar with or new to a region. Pilots were also advised that their knowledge was needed to help in the creation of a worldwide database of threats.

Responses are summarized below:

➤ **SID’S/STAR’S:**

Some remarks involved a misunderstanding between Controllers and Pilots about altitude/speed restrictions on SID’s and STAR’s, some of which resulted in operational errors. The examples below have been taken directly from comments made by Pilots answering the survey:



*ALT constrain shall be canceled by ATC, if instructed other.*

*When approaching the final point, listed in FPL, ATC does not issue STAR clearance, nor do vectoring. I have to constantly ask for the expected type of approach. This leads to a suboptimal descend path, excessive fuel consumption and increased crew load. This is typical for the airports of the Russian Federation*

*SID XXXX has ALT constraint FL60 however all the time it is additionally required to clarify unrestricted climb above 60*

*While issuing SID (STAR) climb / descend clearance, the controller does not often specify that such a maneuver should be performed in compliance with the heights limitations of this scheme. For example: "climb ... WPT ... FT". I would like to hear "Climb following the scheme etc ..."*

*The controller gives ILS approach clearance, which means "you are free" to perform approach procedures until the course and glide slope are captured, but in Russia controllers interpret it differently. After clearance received you may be several times adjusted, etc.*

*In some countries, approach clearance allows also to reduce the speed according to the prescribed SID (STAR) speed limits. In others it is not the case.*

*XXX SID implies direct straight climb up to 3,000 feet and then turn on the desired course. The crew at an altitude of 1500 feet receives an ATC command "heading ..." and starts turn before reaching 3,000 feet. The result - a violation of SID.*



➤ **Words/Numbers pronunciation:**

The use of the words “TO”, and “FOR” which sound similar to numbers was the second most common observation. Some Pilots mentioned that when using altitude (in the lower airspace, as opposed to FL) the possibility of error occurs.

It was also mentioned that when FL was not specifically articulated, it created a situation where these words could be confused for numbers. Therefore, it is important to use FL when appropriate.

*Executing SID in XXX, received a command 'climb one hundred', we assumed to take FL100, it turned out that we were given a heading 100.*

*Figures "two" and "three" some times confuse*

➤ **The use of native language other than English in communication**

Language was mentioned on many occasions throughout the survey and represented overall the most common complaint by Pilots flying in the international theatre. The fact that a local language was used between local Pilots and Controllers was felt to reduce situational awareness by non-native speaking Pilots. Pilots also expressed their difficulty in knowing when to call because they were unable to determine if the conversation was over between Controllers and local Pilots.

Another dimension to the language issue was the complaint of Pilots from non-English speaking countries indicating that Controllers in English speaking countries have a tendency to speak fast, use local phrases, slang or non-ICAO phraseology. This made it difficult for them to understand.

➤ **Speech rate:**

The issue of speech rate was addressed in some of the remarks by the survey participants.



### ➤ **Readback:**

Pilots often felt that their readback was not carefully listened to. Sometimes an incorrect readback was made by the Pilot and was not detected by the Controller. Pilots indicated that they needed an acknowledgment to their readback to close the communication loop. At times, they were told not to readback the clearance but to just listen - this was not acceptable, in the opinion of the survey participants. Examples of quotes from the survey with respect to readback:

*ATC clears: "climb FL four thousand five hundred meters (4500)." A native speaker responds: "climbing forty-five hundred meters (4500)." In this case, the controller typically repeats the sentence asking for the "right" confirmation.*

*ATC gives available takeoff distance as follows: "T \ O distance available 2700 meters", the crew read back "T \ O to cleared altitude 2700 meters" ...*

*At the airport Sheremetyevo (and other Russian airports too) from time to time the controller asks foreign aircraft located at glide slope "Are you ready to land?", This confuses foreign crews forcing them to read back "Cleared to land "? Then ATC asks the same stupid question.*

### ➤ **Multiple Instructions:**

Pilots indicated that when they received too many instructions at once, they were susceptible to mishearing and prone to errors. Communications should be short, convey concise instructions, and should not be given during critical phases of flight (e.g., at high speed during landing rollout). Examples of quotes from the survey with respect to multiple instructions:

*Overall excessive reporting to ATC by Russian regulation. The pilot shall report to ATC: 1. the crossing of every compulsory reporting point, beginning and termination of flight level change manoeuvres (even under radar control) 2. carrying out of turns in accordance with the approach pattern and flight altitude (even under radar control) 3. interception of glide path and commencing descent for landing (even under radar control) 4. readiness for landing 5. In case of declaration of emergency by crew, Controller shall first of all report aircraft position and time! Significant differences in phraseology requirements in Russian and English (the same airspace)*



## ➤ Metric Altitude

Pilots complained that the non-standardized use of meters or feet to denote altitude increased risk because even with new aircraft having both measurements they needed to use an alternative source of information, such as a plasticized card with meter to feet conversions. In many aircraft, meters are not displayed requiring Pilots to convert meters to feet, and then set the altitude window (in feet) to meet the required metric level. Some modern aircraft have this capability through a meter/feet selection button. It was also noted that the useable flight levels vary from one adjacent country to another, requiring a minor altitude adjustment when crossing the border. For example: China and Russia have different useable flight levels but similar enough that if a proper change is not done it could result in encroachment into another flight's airspace. Further adding confusion is the fact that vertical speed indications remain in feet, even when transitioning between metric altitudes.

Pilot's comments from the survey are provided below:

*From November 17, in Russia and the CIS height in terminal area is measured in meters up to the transition height, then in feet. While descending you can by error calculate height in feet, not in meters (eg, set 900 meters, and the crew mistakenly took 900 feet - is 300 meters);*



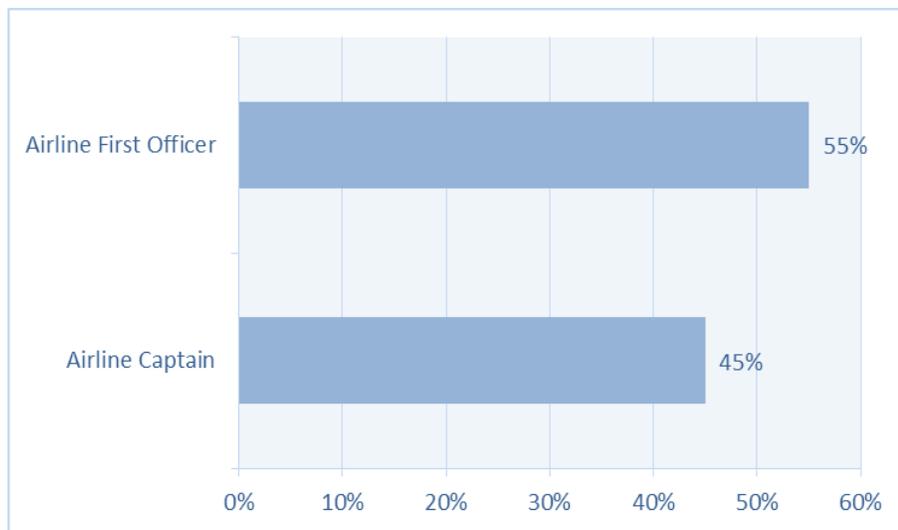
## 6. PILOT SURVEY ANALYSIS – Chinese Translated version

It was notable that there was a reduced number of responses from both types of participants in regions where English was not the principal language. As a consequence, these surveys were translated into two other local languages in the hope of ensuring a broader scope of responses from all major regions of the world. This section presents analysis results of the translated version of the Pilot Phraseology Survey that was conducted in Chinese.

The survey responses were very limited with only 11 respondents from North Asia region and hence Pilots comments were not included in this section.

### 6.1 SURVEY ANALYSIS

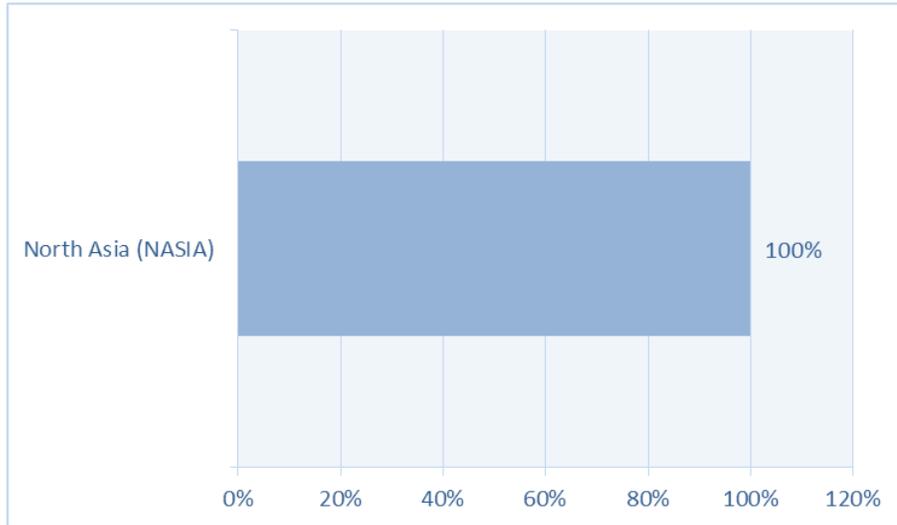
**Question 1, 'I am an...':** The purpose of this question is to identify the role of the individual completing the survey. It was notable that the majority of the respondents were Airline First Officers (55%) and 45% were Airline Captains. There were no set targets for either Captains or First Officers.



Question 1: I am an

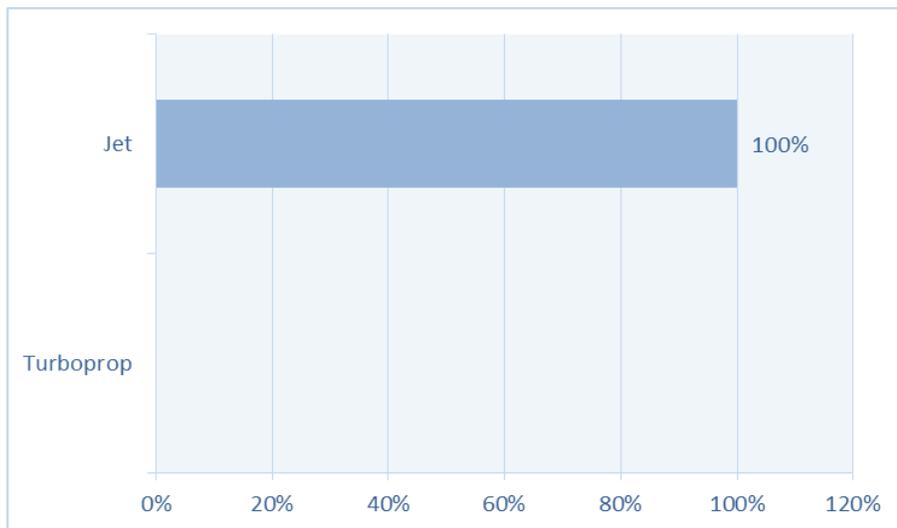


**Question 2, 'I am based in...':** All respondents were based in North Asia.



Question 2: I am based in

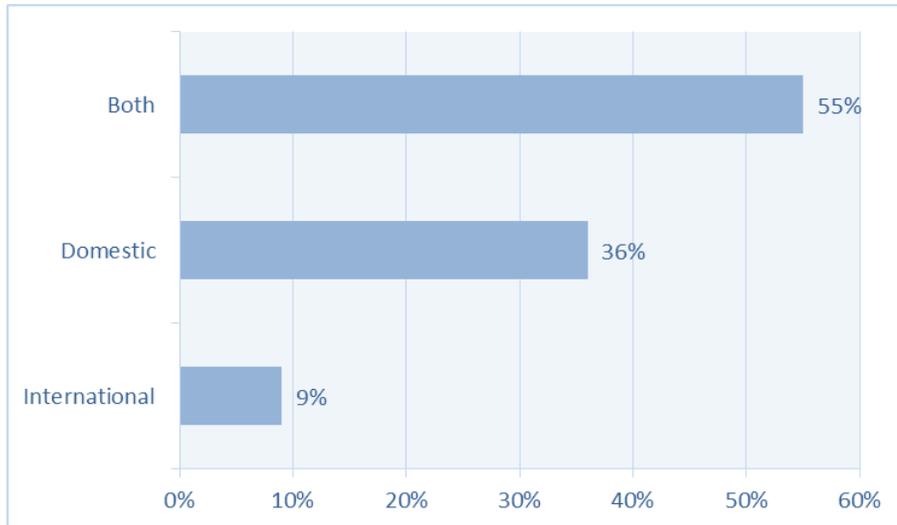
**Question 3, 'What type of aircraft do you mainly fly?':** This question identified the aircraft type of operation. This illustrates that 100% of the survey respondents were Jet Pilots.



Question 3: What type of aircraft do you mainly fly?

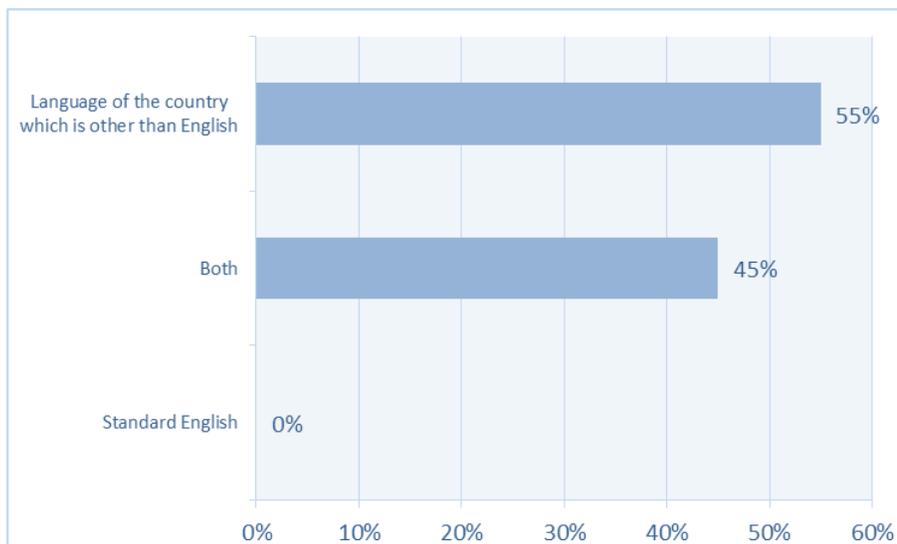


**Question 4, 'My flying is mostly...':** The group of respondents consisted primarily of Pilots who operated international flights. 64% of the Pilots indicated that they are flying internationally, or both international and domestic (short-haul flights).



Question 4: My flying is mostly:

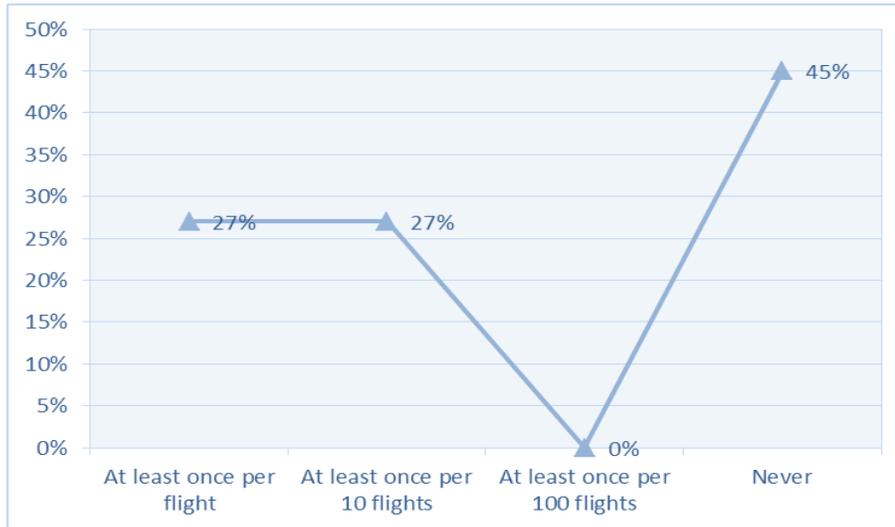
**Question 5, 'If I am based in a country where English is not the mother tongue, what language is used to communicate?':** This question dealt with the use of native languages in aviation communication. 55% of the Pilots who responded used a language other than English to communicate at certain times and 45% of the Pilots who responded used both Standard English and language other than English.



Question 5: If I am based in a country where English is not the mother tongue, what language is used to communicate?

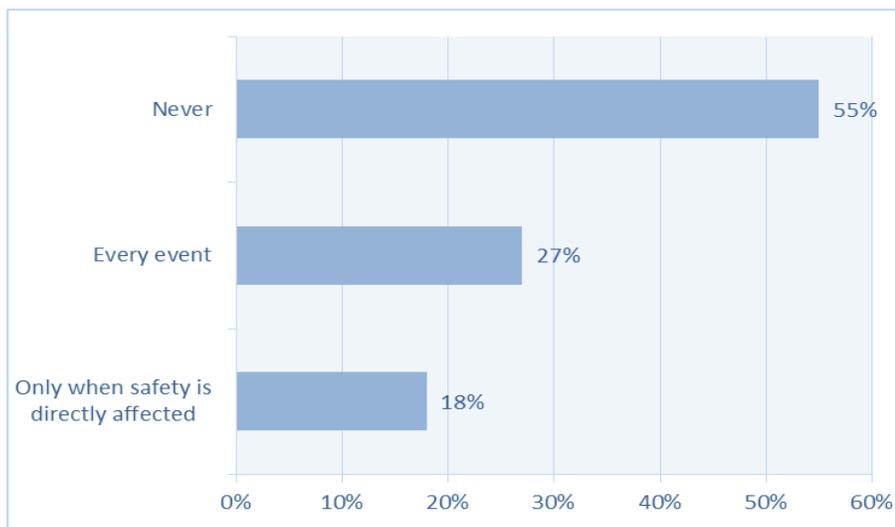


**Question 6, ‘How frequently are you in a situation where ICAO standard phraseology is NOT used?’:** The results of the survey showed the frequency with which Pilots experienced an event where ICAO standard phraseology was not used. 27% of all respondents indicated that they experienced this type of communication problem at least once per flight. 27% of participants reported that they encounter this problem once per ten (10) flights. However, 45% reported no experience in this type of communication problem.



Question 6: How frequently are you in a situation where ICAO standard phraseology is NOT used?

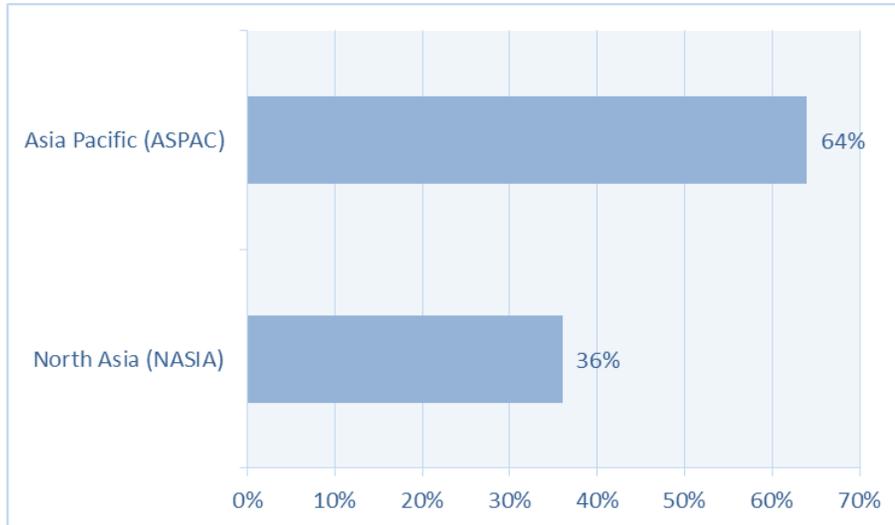
**Question 7, ‘How often do you report in your company reporting systems events where ICAO standard phraseology is not used?’:** Illustrates that 18% of the respondents formally reported communication issues only when they encountered safety consequences. 27% of the respondents said that they report every event, and 55% of Pilots indicated that they never report this type of event.



Question7: How often do you report in your company safety reporting systems events where ICAO standard phraseology is NOT used?

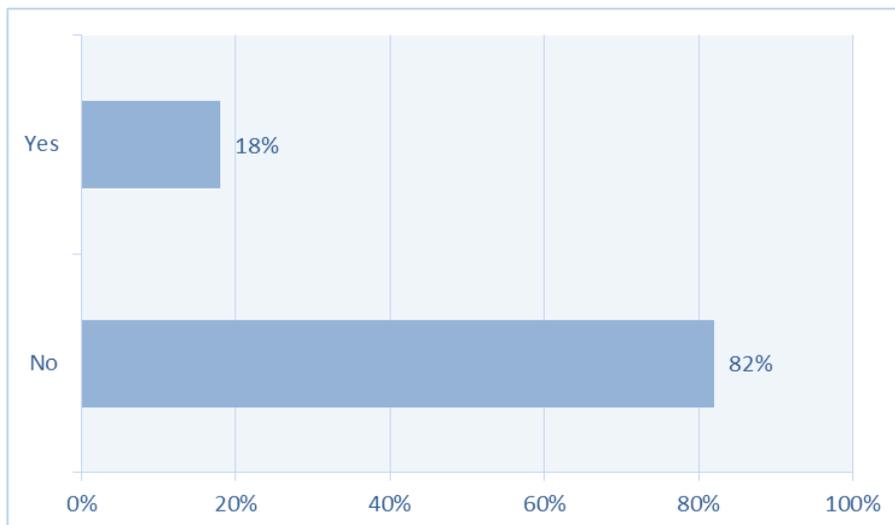


**Question 8, 'In what region do you most often experience an event where ICAO standard phraseology is NOT used?':** This question illustrates the regional distribution of Pilot responses where ICAO standard phraseology was not used. The survey revealed that Asia Pacific (ASPAC) had the highest percentage with 64%, followed by North Asia (NASIA) 36%. The fact that participants indicated that they have encountered an experience in a particular region should be considered in relation to their exposure and destinations.



Question 8: In what region do you most often experience an event where ICAO standard phraseology is NOT used?

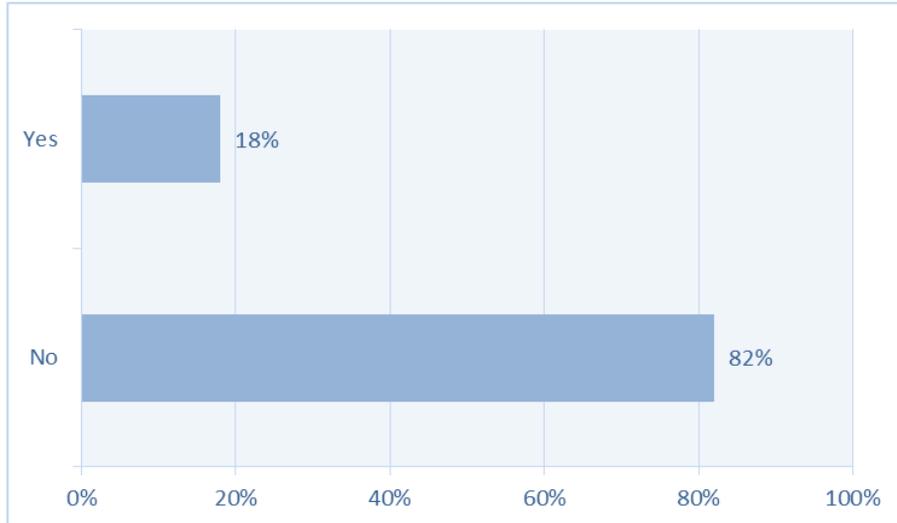
**Question 9, 'Is there an airport(s) where ICAO standard phraseology is not used?':** The responses to this question indicated that 18% of the survey respondents' experienced events where ICAO standard phraseology was not used.



Question 9: Is there an airport(s) where ICAO standard phraseology is NOT used?

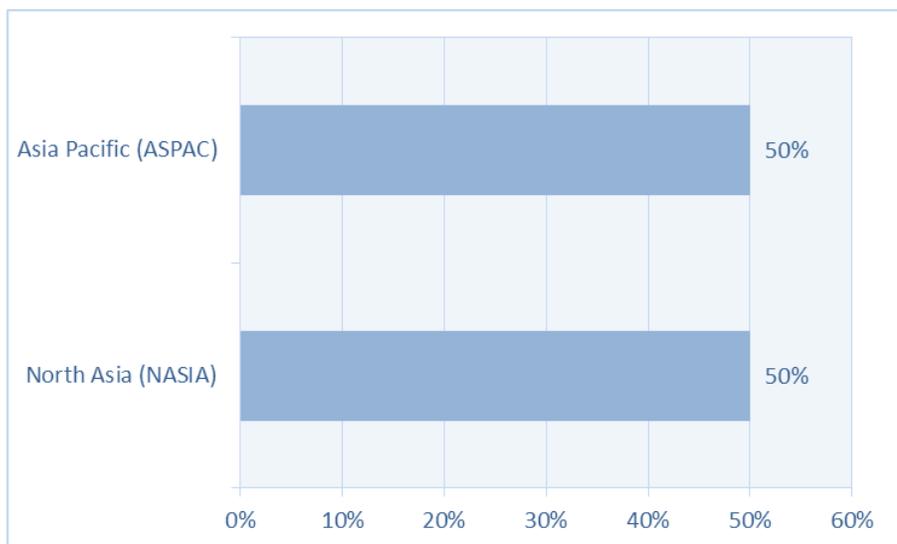


**Question 10, 'Is there a procedure or a common practice used by pilots or ATC that causes misunderstanding or errors?':** This question illustrates that 18% of the survey respondents indicated that there was a procedure or a common practice used by either Pilots or Controllers that created a threat of misunderstanding and errors.



**Question 10: Is there a procedure or a common practice used by pilots or ATC that creates misunderstanding or errors?**

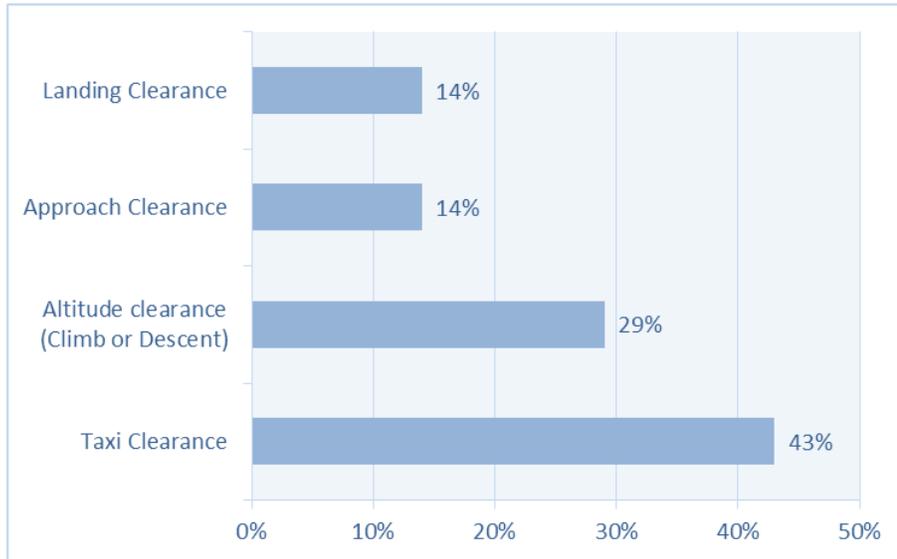
**Question 11, 'If you answer yes to Question 10, please identify the region in which the airport is located and describe the specific threat or misunderstanding':** The respondents had an opportunity (if their answer was yes to question ten (10) above) to identify the region where the airport was located.



**Question 11: If you answer yes to question number 10, please identify the region where the airport is located, and describe the specific threat or the misunderstanding**

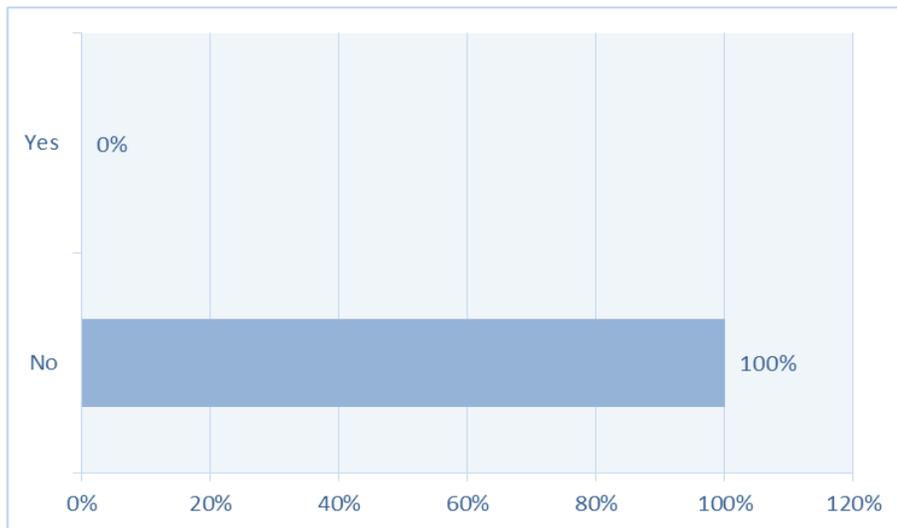


**Question 12 'In what situation does this typically occur?':** Respondents were able to choose more than one answer. Taxi clearances seemed to be problematic for Pilots.



Question 12: In what situation does this typically occur?

**Question 13, 'Are you aware of misunderstandings/interpretations or common errors made when using CPDLC?':** The vast majority of Pilots indicated from their experience that they do not encounter any difficulties with the use of Controller Pilot Data Link Communications (CPDLC).



Question 13: Are you aware of misunderstandings/interpretations or common errors made when using CPDLC?



**Question 14: 'This question is more about practices that Pilots experience that are not always standard around the world thus creating a threat: Is there a procedure or a common practice used by pilots or ATC that creates a threat?'** This part of the survey was more about practices that Pilots have observed that were not always standard around the world, thus creating a threat. In the survey questionnaire, the participants were able to cite and comment on procedures or common practices used by Pilots or Controllers that could possibly create a threat to the safety of a flight, especially for flight crews non-familiar or new to a region. Pilots were also advised that their knowledge was needed to help in the creation of a worldwide data base of threats.

- The approach controllers at some airports in China Mainland usually provide a fixed heading to the final leg to flight crew, when the aircraft turns from base leg to final for capturing ILS, without considering the actual distance between the aircraft and the final as well as between the aircraft and the runway. For example, the approach controller usually gives the flight crew such verbal instruction for turning to the final: "Turn right heading 350°, cleared for ILS approach runway XX". But the actual distance of the aircraft to the runway was not considered, thus disregarding the certainty of the 350° right turn.
- The initial altitude was given by the ATC clearance delivery is a higher altitude (e.g. 9000ft), and then after take-off the controller may give a lower altitude (e.g. 5000ft) due to the need of adjustment, therefore, it may result in fly to wrong altitude or confliction.
- Normally only the latest instruction from the ATC must be executed, i.e. "Direct climb to FL250", but the level off is not considered.
- Many countries or control areas using different measurement units, so the crew members may make mistakes in the circumstances while verbal communication is weak, or the crew members are tired.
- This kind of case normally does not happen. When an ATC instructs flight crew to climb to FL090, the instruction should be "Climb and maintain FL090", so the altitude confusion could be avoided.



## APPENDIX A — IATA REGIONS

Region	Country
AFI  (Africa)	Angola
	Benin
	Botswana
	Burkina Faso
	Burundi
	Cameroon
	Cape Verde
	Central African Republic
	Chad
	Comoros
	Congo, Democratic Republic of
	Congo, Republic of
	Côte d'Ivoire
	Djibouti
	Equatorial Guinea
	Eritrea
	Ethiopia
	Gabon
	Gambia
	Ghana
	Guinea
	Guinea-Bissau
	Kenya
	Lesotho
	Liberia
	Madagascar
	Malawi
	Mali
	Mauritania
	Mauritius
	Mozambique
	Namibia
	Niger
	Nigeria
Rwanda	
São Tomé and Príncipe	
Senegal	
Seychelles	
Sierra Leone	
Somalia	
South Africa	
Swaziland	
Tanzania	
Togo	
Uganda	
Zambia	
Zimbabwe	

Region	Country
ASPAC  (Asia / Pacific)	Australia <sup>1</sup>
	Bangladesh
	Bhutan
	Brunei Darussalam
	Burma
	Cambodia
	East Timor
	Fiji Islands
	India
	Indonesia
	Japan
	Kiribati
	Laos
	Malaysia
	Maldives
	Marshall Islands
	Micronesia
	Nauru
	Nepal
	New Zealand <sup>2</sup>
	Pakistan
	Palau
	Papua New Guinea
	Philippines
	Samoa
	Singapore
	Solomon Islands
South Korea	
Sri Lanka	
Thailand	
Tonga	
Tuvalu, Ellice Islands	
Vanuatu	
CIS  (Commonwealth of Independent States)	Vietnam
	Armenia
	Azerbaijan
	Belarus
	Georgia
	Kazakhstan
	Kyrgyzstan
	Moldova
	Russia
	Tajikistan
	Turkmenistan
EUR  (Europe)	Ukraine
	Uzbekistan
	Albania
	Andorra
	Austria
	Belgium



Region	Country
EUR (Europe)	Bosnia and Herzegovina
	Bulgaria
	Croatia
	Cyprus
	Czech Republic
	Denmark <sup>3</sup>
	Estonia
	Finland
	France <sup>4</sup>
	Germany
	Greece
	Hungary
	Iceland
	Ireland
	Israel
	Italy
	Kosovo
	Latvia
	Liechtenstein
	Lithuania
	Luxembourg
	Macedonia
	Malta
	Monaco
	Montenegro
	Netherlands <sup>5</sup>
	Norway
	Poland
	Portugal
	Romania
	San Marino
	Serbia
	Slovakia
Slovenia	
Spain	
Sweden	
Switzerland	
Turkey	
LATAM (Latin America & the Caribbean)	United Kingdom <sup>6</sup>
	Vatican City
	Antigua and Barbuda
	Argentina
	Aruba
	Bahamas
	Barbados
	Belize
	Bolivia
	Brazil
	Chile
Colombia	

Region	Country
LATAM (Latin America & the Caribbean)	Costa Rica
	Cuba
	Dominica
	Dominican Republic
	Ecuador
	El Salvador
	Grenada
	Guatemala
	Guyana
	Haiti
	Honduras
	Jamaica
	Mexico
	Nicaragua
	Panama
	Paraguay
	Peru
	Saint Kitts and Nevis
	Saint Lucia
	Saint Vincent and the Grenadines
	Suriname
	Trinidad and Tobago
	Uruguay
Venezuela	
MENA (Middle East & North Africa)	Afghanistan
	Algeria
	Bahrain
	Egypt
	Iran
	Iraq
	Jordan
	Kuwait
	Lebanon
	Libya
	Morocco
	Oman
	Qatar
	Saudi Arabia
	Sudan
	Syria
	Tunisia
United Arab Emirates	
Yemen	
NAM (North American)	Canada
	United States of America <sup>7</sup>
NASIA (North Asia)	China <sup>8</sup>
	Mongolia
	North Korea



**<sup>1</sup>Australia includes:**

Christmas Island  
Cocos (Keeling) Islands  
Norfolk Island  
Ashmore and Cartier Islands  
Coral Sea Islands  
Heard Island and McDonald Islands

**<sup>2</sup>New Zealand includes:**

Cook Islands  
Niue  
Tokelau

**<sup>3</sup>Denmark includes:**

Faroe Islands  
Greenland

**<sup>4</sup>France includes:**

French Polynesia  
New Caledonia  
Saint-Barthélemy  
Saint Martin  
Saint Pierre and Miquelon  
Wallis and Futuna  
French Southern and Antarctic Lands

**<sup>5</sup>Netherlands include:**

Netherlands Antilles

**<sup>6</sup>United Kingdom includes:**

England  
Scotland  
Wales  
Northern Ireland  
Akrotiri and Dhekelia

Anguilla  
Bermuda  
British Indian Ocean Territory  
British Virgin Islands  
Cayman Islands  
Falkland Islands  
Gibraltar  
Montserrat  
Pitcairn Islands  
Saint Helena  
South Georgia and the South Sandwich Islands  
Turks and Caicos Islands  
British Antarctic Territory  
Guernsey  
Isle of Man  
Jersey

**<sup>7</sup>United States of America include:**

American Samoa  
Guam  
Northern Mariana Islands  
Puerto Rico  
United States Virgin Islands

**<sup>8</sup>China includes:**

Hong Kong  
Macau  
Taiwan



## APPENDIX B — Pilots Survey Questionnaires

The purpose of this 10 minute pilot survey is to utilize the knowledge of the global pilot community to identify areas where the common use of phrases or expressions is not standardized and may be misunderstood. This survey is being accomplished in cooperation with the International Federation of Airline Pilots' Associations (IFALPA). IATA would like to document communications challenges that pilots and ATC personnel have to deal with around the world, especially those identified as challenges for non-local aircrew's. These challenges can be phraseology issues such as incorrect, ICAO non-standard or locally unique communications. However, we also want this survey to go beyond communications issues. We would like to use this opportunity to query your knowledge and find out procedures or common practices used by pilots or controllers that can possibly create a threat to the safety of a flight, especially for flight crews non-familiar or new to a region.

Your survey inputs will be compiled, and segregated by region and airport to provide feedback of what was found. The survey results will be published to the industry and ATC organizations. If you wish to receive a copy of the completed survey analysis simply include your e-mail when prompted. This survey is totally anonymous (if you do not wish to provide your e-mail), however the region where you are based or sector you control, or type of flying that you do is required for us to segregate the data properly.

1. I am an

- Airline Captain
- Airline First Officer
- Other, please specify

2. I am based in this region:

- Africa (AFI)
- Asia Pacific (ASPAC)
- Europe (EUR)
- Commonwealth of Independence States (CIS)
- North America (NAM)
- North Asia (NASIA)
- Latin America and the Caribbean (LATAM)
- Middle East and North Africa (MENA)

3. What type of aircraft do you mainly fly?

- Jet
- Turboprop
- Other, please specify

4. My flying is mostly:

- Domestic
- International
- Both

5. If I am based in a country where English is not the mother tongue, what language is used to communicate.

- Standard English
- Language of the country which is other than English
- Both

6. How frequently are you in a situation where ICAO standard phraseology is NOT used?

- At least once per flight
- At least once per 10 flights
- At least once per 100 flights
- Never

7. How often do you report in your company safety reporting systems events where ICAO standard phraseology is NOT used?

- Every event
- Only when safety is directly affected
- Never

8. In what region do you most often experience an event where ICAO standard phraseology is NOT used?

- Africa (AFI)
- Asia Pacific (ASPAC)
- Europe (EUR)
- Commonwealth of Independence States (CIS)
- North America (NAM)



- North Asia (NASIA)
- Latin America and the Caribbean (LATAM)
- Middle East and North Africa (MENA)

This last part of the survey is more about practices that you see occurring that are not always standard around the world thus creating a threat. These questions are important because your answers will be used to build a world wide data base of threats.

9. Is there an airport(s) where ICAO standard phraseology is NOT used?

- If yes, please specify airport code(s)

10. Is there a procedure or a common practice used by pilots or ATC that creates misunderstanding or errors?

- If yes, please provide example

11. If you answer yes to question number 10, please identify the region where the airport is located, and describe the specific threat or the misunderstanding.

- Africa (AFI)
- Asia Pacific (ASPAC)
- Europe (EUR)
- Commonwealth of Independence States (CIS)
- North America (NAM)
- North Asia (NASIA)
- Latin America and the Caribbean (LATAM)
- Middle East and North Africa (MENA)
- Please specify

12. In what situation does this typically occur

- General ATC Clearance
- Route clearance or re-route clearance
- Taxi Clearance
- Take off Clearance
- Altitude clearance (Climb or Descent)
- Approach Clearance
- Landing Clearance

13. Are you aware of misunderstandings / interpretations or common errors made when using CPDLC?

- If yes, please specify

14. Is there a procedure or a common practice used by pilots or ATC that creates a threat? Is there a local phrase that is often misunderstood? The examples provided below are to help focus on the type of information that we are looking for. We would appreciate if you would provide examples of your own.

Example 1:

After landing, when you are taxiing off the runway, ATC clears you to the gate. However there is a non-active runway to cross before arriving to your gate. In some countries you are allowed to cross without further clearance and in some countries you need a specific clearance to cross any runway taxiing to your gate. The lack of consistency may be considered a threat.

Example 2:

You are cleared for a SID to FL 210. This specific SID has intermediate level off altitude on the climb out at 17,000. You receive a new clearance to "climb to FL 250". Do you still have to respect the intermediate level off altitude? The answer can vary from country to country. This is potentially a threat.

Example 3:

When climbing on a SID, pilot were instructed to level off at FL70, next ATC clearance was "Climb to (two?) nine zero". Pilots understood that they are cleared to climb FL290, but what ATC meant was climb to FL90.

Please provide examples of your own in the space provided below:



## APPENDIX C — Air Traffic Controllers Survey Questionnaires

The purpose of this 10 minute survey is to utilize the knowledge of the global air traffic controller community to identify areas where the common use of phrases or expressions is not standardized and may be misunderstood. This survey is being accomplished in cooperation with the International Federation of Air Traffic Controllers' Association (IFATCA). IATA would like to document communications challenges that pilots and ATC personnel have to deal with around the world, especially those identified as challenging for non-local aircrews. These challenges can be phraseology issues such as incorrect, ICAO non-standard or locally unique communications. However, we also want this survey to go beyond communications issues. We would like to use this opportunity to query your knowledge and find out procedures or common practices used by pilots or controllers that can possibly create a safety concern, especially for flight crews new to a region.

Your survey inputs will be compiled, and analyzed by region. The survey results will be published to the industry and ATC organizations. If you wish to receive a copy of the completed survey analysis simply include your e-mail when prompted. This survey is totally anonymous (if you do not wish to provide your e-mail), however the region where you are based or sector you control, is required for us to segregate the data properly.

1. What is your primary job focus?

- Tower
- Approach Control
- Area Control Center
- Other, please specify

2. What separation standards do you use most?

- Procedural
- Surveillance (i.e. radar)

3. I am based in this region:

- Africa
- Asia Pacific

- Europe
- Commonwealth of Independence States
- North America
- North Asia
- South America and the Caribbean
- Middle East and North Africa

4. If I am based in a country where English is not the mother tongue, what language is used to communicate?

- Standard English
- Language of the country which is other than English
- Both

5. How frequently are you in a situation where ICAO standard phraseology is NOT used?

- At least daily
- At least weekly
- At least monthly
- Never

6. How often do you report in your safety reporting systems events where ICAO standard phraseology is NOT used?

- Every event
- Only when safety is directly affected
- Never
- Do not have a safety reporting system

7. Specify the originating region that most often airline operators are from which do NOT use ICAO standard phraseology:

- Africa
- Asia Pacific
- Europe
- Commonwealth of Independence States
- North America
- North Asia
- South America and the Caribbean
- Middle East and North Africa
- N/A



8. Is there a specific phraseology, (standard or non-standard) routinely used that creates confusion, or is misunderstood? If yes, describe the specific confusion or the misunderstanding.
  - If yes, please specify airport code(s)
  
9. In what situation does this typically occur (e.g. in a certain phase of the flight).
  - Pilot Response
  - Route clearance or re-route clearance
  - Taxi Clearance
  - Take off Clearance
  - Altitude clearance (Climb or Descent)
  - Approach Clearance
  - Landing Clearance
  
10. Are you aware of misunderstandings / interpretations or common errors made when using CPDLC?
  - Yes
  - No
  - N/A
  - If yes, please provide example

This last part of the survey is more about practices that you see occurring that are not always standard around the world thus creating a safety concern. These questions are important because your answers will be used to build a world wide data base of safety concerns.

11. Is there a procedure or a common practice used by pilots or ATC that creates a safety concern? Is there a local phrase that is often misunderstood? The examples provided below are to help focus on the type of information that we are looking for. We would appreciate if you would provide examples of your own.

Example 1:

I give an altitude restriction to a pilot on a STAR that has a published "expect speed and altitude". I did not issue the speed

restriction to the leading aircraft in order to avoid compression on the arrival. Some operators require the pilot to comply with the speed restriction even though it was not issued and as a result the pilot does not advise me that he is slowing down. I have no way to know about this company policy and it can result in a loss of separation with the trailing aircraft.

Example 2:

Weather deviations create high workload for controllers and I often have to limit what the aircraft can do in order to prevent conflict with other traffic. In my experience, it is common to clear an aircraft to deviate left and right of course and the pilot will read back "deviate as necessary" this requires me to restate the limitations because "as necessary" could also allow altitude deviations. This ties up the frequency at a very busy time.

Example 3:

We have a problem with aircraft reading back a clearance without using a call sign, or by using just the numbers and not the company name, this is a very dangerous practice and makes the controller unable to catch an error if the wrong aircraft takes the clearance.

Please provide examples of your own in the space provided below:



## APPENDIX D — References

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Communication between controllers and U.S. pilots in non-U.S. airspace takes extra attention.

Rick Darby

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New ATC phraseology during runway construction in US airports