

## BIBLIOGRAPHY

- Adams, S. (1995). "Manager's journal: The Dilbert principle." Wall Street Journal [New York, N.Y.] 22 May 1995, Eastern edition: A12. Wall Street Journal.
- Ana – Marija P. (2014). *Non Standard Phraseology in Aviation English*. Seminar Paper, University of Basel.
- Accident Investigation Branch (1975) Boeing 747-136 G-AWNJ Report of the incident near Nairobi Airport, Kenya, on 3 September 1974. Aircraft Accident Report 14/75. Department of Trade, HMSO, London.
- Airservices Australia (1995) Manual of Air Traffic Services. Amendment List 22, 16 July 1998. Canberra.
- Bartsch, R. (1996) Aviation Law in Australia. LBC Information Services, Sydney.
- Besco, R. (1997) The awkward alliance: the controller/pilot team. The Journal of Air Traffic Control. December, pp 24-31.
- Billings, C. and Cheaney, E. (1981) The information transfer problem: summary and comments. Information Transfer Problems in the Aviation System. NASA Technical Paper 1875. NASA, California.
- Borins, S. (1983) The Language of the Skies: The Bilingual Air Traffic Control Conflict in Canada. McGill-Queen's University Press, Montreal.
- Boughen, D. (1994) Air traffic controller liability—the Australian perspective. Aviation Law Association of Australia and New Zealand Annual Conference.
- Brauner, C. (1994) Communicating in Aviation. Swiss Reinsurance Company, Zurich.
- Brenlove, M. (1993) Vectors to Spare: The Life of an Air Traffic Controller. Iowa State University, Ames.
- Brookes, A. (1996) Flights to Disaster. Ian Alan Publishing, Surrey, England.
- Bureau of Air Safety Investigation (1998a) Bureau of Air Safety Investigation Summary Report (Public) 1993-96. BASI, Canberra.
- Bureau of Air Safety Investigation (1998b) 'Eight' in international callsigns. Asia-Pacific Air Safety, June, Issue 18, p 28.
- Bureau of Air Safety Investigation (1997a) An Analysis of Incidents Involving Aircrew Failing to Comply with Air Traffic Clearances June to August 1996. BASI, Canberra.
- Bureau of Air Safety Investigation (1997b) Watch the game! Asia-Pacific Air Safety, November, Issue 16, pp 12-14.
- Bureau of Air Safety Investigation (1993) Boeing 737-377 VH-CZG Boeing 737-376 VH-TJD Mount Isa, Queensland 1 March 1991. Investigation report B/911/3044. BASI, Canberra.
- Byron, B. (1997) Air traffic clearances: what you heard may not be correct. Asia-Pacific Air Safety, July, Issue 15, pp 14-16. BASI, Canberra.
- Clark, Herbert H. and Brennan, Susan E. (1991). Grounding in communication. In L. B. Resnick, J. Levine, and S. D. Teasley, editors, *Perspectives on Socially Shared Cognition*. APA, 1991.

- Clark, Herbert H. and Schaefer, R. F. (1989). Contributing to discourse. *Cognitive Science*, 13:259-294, 1989.
- Clark, Herbert H. (1994). Managing problems in speaking. *Speech Communication*, 15:243 - 250, 1994.
- Cognition, Volume 22, Issue 1, 1986, Pages 1-39, ISSN 0010-0277, [https://doi.org/10.1016/0010-0277\(86\)90010-7](https://doi.org/10.1016/0010-0277(86)90010-7).  
(<http://www.sciencedirect.com/science/article/pii/0010027786900107>)
- Curtis, P. (1993). LambdaMOO programmer's manual. Xerox Parc, 1993.
- Cushing, S. (1994). *Fatal Words: Communication Clashes and Aircraft Crashes*. The University of Chicago Press.
- Casanova, D. (1992) The French National College of Civil Aviation. The Controller, December, p 15.
- Civil Aviation Safety Authority (1998) Civil Aviation Regulations. Sixth edition, seventh amendment, March.
- Cushing, S. (1995) Pilot-air traffic control communications: it's not (only) what you say, it's how you say it. Flight Safety Foundation, Vol.14, No.7, July, pp 25-31.
- Dillenbourg, et al. (1996a). Grounding in multi-modal task-oriented collaboration. To be presented at European Conference on AI in Education. Lisbon, September, 1996.
- Dillenbourg, et al (1996b). Miscommunication in Multi-modal Collaboration. University of de Genieve, Garonge, Switzerland.
- Endsley, M. and Smolensky, M. (1998) Situation awareness in air traffic control. In Smolensky, M. and Stein, E. (eds.) Human Factors in Air Traffic Control, pp 115-154. Academic Press, San Diego.
- Estival, D., and Molesworth, B.R C. (2012). Radio Miscommunication: EL2 Pilots in the Australian General Aviation Environment February 2012. *Linguistics and the Human Sciences* 5(3):351-378 DOI: 10.1558/lhs.v5i3.351
- Falzon, P. (2009). Discourse segmentation and the management of multiple tasks in single episodes of air traffic controller-pilot spoken radio communication. *Discours*, 4 [accessed Dec 29 2020].
- Fisher, S. and Kulick, I. (1998) Air traffic controller training: a new model. In Smolensky, M. and Stein, E. (eds.) Human Factors in Air Traffic Control, pp 273-298. Academic Press, San Diego.
- Gero, D. (1996) Aviation Disasters. Second edition. Patrick Stephens Ltd, Somerset.
- Goertz, H. (1997) New approach to ATC English proficiency. *Journal of Air Traffic Control*, July-Sept., pp 46-50.
- Grayson, R. and Billings, C. (1981) Information transfer between air traffic control and aircraft: communications problems in flight operations. In Billings, C. and Cheaney, E. (eds.) Information Transfer Problems in the Aviation System. NASA Technical Paper 1875. NASA, California.
- Gibbens, S. (2018) Ancient Cave Drawings and Early Human Language Linked in New Study, published by National Geographic Website (<https://www.nationalgeographic.com/news/2018/02/acoustic-caves-rock-art-language-origin-spd/>)

- Goguen J. A. and Linde, C. (1983) Linguistic Methodology for the Analysis of Aviation Accidents. NASA Contract Report 3741.
- Hamilton, R. 1991. *Is the direct track really worth the risk?* BASI Journal. No.8, June, pp 9-10. Bureau of Air Safety Investigation, Canberra.
- Haryani, H. (2018). *Miscommunication in Pilot – Controller Interaction*. The Southeast Asian Journal of English Language Studies. Malaysia
- Hawkins, F. (1993) Human Factors in Flight. Second edition. Orlady, H.W. (ed.) Avebury Aviation, Aldershot, England.
- Hayward, B. (1997) Culture, CRM and aviation safety. Australian and New Zealand Societies of Air Safety Investigators Conference, Brisbane.
- Hopkin, V. (1995) Human Factors in Air Traffic Control. Taylor and Francis, London.
- IATA Passenger Glossary of Terms. (2018). Sources taken from [www.iata.org/contentassets/iata-passenger-glossary-](http://www.iata.org/contentassets/iata-passenger-glossary-)
- ICAO council, (2001). *ICAO Annex 10 Aeronautical Telecommunications Volume II*, Montreal International Civil Aviation Academy
- ICAO 8585 (2020), - Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services, 193rd Edition, July 2020. <[https://global.ihc.com/doc\\_detail.cfm?document\\_name=ICAO%208585&item\\_s\\_key=00118881](https://global.ihc.com/doc_detail.cfm?document_name=ICAO%208585&item_s_key=00118881)>
- International Civil Aviation Organisation (1993) Human factors in air traffic control. Human Factors Digest No.8. Circular 241-AN/145. ICAO, Montreal.
- Lewis, K. L. (1969). *Convention: A Philosophical Study*. Harvard University Press, 1969.
- Lewis, Michael (2020). Causes of Miscommunication. (<https://www.moneycrashers.com/causes-miscommunication-use-plain-language/> retrived on September 20, 2020.
- Linde, C. (1988) Politeness and accidents in aviation discourse: The quantitative study of communicative success. *Language in Society* 17 (3): 375–399. <http://dx.doi.org/10.1017/S0047404500012951>
- McMilan, D. (1998). *Miscommunication in Air Traffic Control*. Queensland.
- Maurino, D., Reason, J., Johnston, N. and Lee, R. (1995) Beyond Aviation Human Factors. Avebury Aviation, Aldershot, England.
- McMillan, David (1998). Miscommunications in Air Traffic Control. School of Learning and Development, Faculty of Education - Queensland University of Technology (A Project submitted in partial fulfilment of the requirements for the award of the degree of Master of Education)
- Morrow, D. and Rodvold, M. (1998) Communications issues in air traffic control. In Smolensky, M. and Stein, E. (eds.) *Human Factors in Air Traffic Control*, pp 421-456. Academic Press, San Diego.
- National Research Council (1997) Flight to the Future. Human Factors in Air Traffic Control. In Wickens, C., Mavor, A. and McGee, J. (eds.) National Academy Press, Washington D.C.
- Nevile, M. and Walker, M. (2005) A Context for Error: Using Conversational Analysis to Rep-resent and Analyse Recorded Voice Data. Report prepared for the Australian Transport Safety Bureau. ATSB Aviation Research Report B2005/0108.
- Nevile, M. (2008) Being out of order: Overlapping talk as evidence of trouble in airline pilots' work. In V. K. Bhatia, J. Flowerdew and R. H. Jones (eds)

- Advances in Discourse Studies, 36–50. Abingdon: Routledge [accessed Dec 29 2020].
- Norrish, L. (2001). AERONAUTICAL MOBILE COMMUNICATIONS PANEL (AMCP). WORKING GROUP CAgenda Item 5: Annex 10 Radiotelephony Procedures (Action WGC/1-3: WG-C to revisit the Annex 10 radiotelephony procedures). 15-19 October 2001 Anchorage, Alaska.
- Oliveira, K. (2007) Command of English would have prevented Brazil's worst air tragedy ever'. URL: <http://www.brazzimag.com>. Tuesday 20 February 2007[accessed Dec 29 2020].
- Owen, C. (1995) Creating space for learning in air traffic control: back to the future? Australian Aviation Psychology Symposium, Manly, 20-24 November.
- Pariès, J. (1996) Human factors aspects of the Mont Sainte-Odile accident. In Hayward, J. and Lowe, A. (eds.) Applied Aviation Psychology: Achievement, Change and Challenge. Proceedings of the Third Australian Aviation Psychology Symposium. Avebury Aviation, Sydney.
- Porter, R. (1981) Information transfer during contingency operations: emergency air-ground communications. In Billings, C. and Cheaney, E. (eds.) Information Transfer Problems in the Aviation System. NASA Technical Paper 1875, NASA, California.
- Reason, J. (1997) Managing the Risks of Organizational Accidents. Ashgate Publishing, Aldershot, England.
- Reason, J. (1990) Human Error. Cambridge University Press, New York.
- Redding, R. (1992) Analysis of operational errors and workload in air traffic control. Proceedings of the Human Factors Society 36th Annual Meeting.
- Roske-Hofstrand, R. and Murphy, E. (1998) Human information processing in air traffic control. In Smolensky, M. and Stein, E. (eds.) Human Factors in Air Traffic Control, pp 65-114. Academic Press, San Diego.
- Ruitenbergh, B. (1997) Situational awareness in air traffic control—a model. The Controller, March, pp 8-11.
- Shappell, S. and Wiegmann, D. (1997). A human error approach to accident investigation: the taxonomy of unsafe operations. The International Journal of Aviation Psychology, Vol.7, No.4, pp 269-291.
- Skybrary. (2016). Call-sign Confusion. ([https://www.skybrary.aero/index.php/Call-sign\\_Confusion](https://www.skybrary.aero/index.php/Call-sign_Confusion)) retrived on December 20, 2020
- SkyBrary. (2020). Call-sign Confusion ([www.skybrary.aero/index.php/Call-sign\\_Confusion](http://www.skybrary.aero/index.php/Call-sign_Confusion)) retrived on December 2, 2020.
- Sprogis, H. (1997) Deadly misunderstandings of English in aviation. Proceedings of the Twenty-eighth International Seminar of the International Society of Air Safety Investigators, Anchorage, Alaska, September 28 - October 3.
- Staunton, J. (1996) The Commission of Inquiry into the Relations Between the Civil Aviation Authority and Seaview Air. Report of the Commissioner, James Henry Staunton AO CBE QC. Part 12. Air Traffic Services, pp 219-274. AGPS, Canberra.
- Tattersall, A. (1998) Individual differences in performance. In Smolensky, M. and Stein, E. (eds.) Human Factors in Air Traffic Control, pp 185-213. Academic Press, San Diego.

- Thomas, G. (1998) Report adds to doubts over Garuda. *The West Australian*, Saturday, January 17.
- Traum, Traum. 1994. *A Computational Theory of Grounding in Natural Language Conversation*. PhD thesis, Department of Computer Science, University of Rochester, 1994. Also available as TR 545, Department of Computer Science, University of Rochester.
- Uplinger, S. (1997) English language training for air traffic controllers must go beyond basic ATC vocabulary. *Flight Safety Foundation Airport Operations*, Vol.23, No.5, Sept-Oct, pp1-5.

# Appendices

## Appendix 1

The following is some technical terms and abbreviation used in this research. Those terms and abbreviation are commonly used by ATC operators and Pilot

<b>Technical Terms</b>		
Air Ground Communication	:	Two-way communication between aircraft and stations or locations on the surface of the earth.
AIRPROX	:	A situation in which a pilot or air traffic services personnel opinion where the distance between aircraft and the relative positions and speed have been safety compromised
Air Traffic Control (ATC)	:	A unit provides a service for the purpose of: <ol style="list-style-type: none"> <li>1. preventing collisions:               <ol style="list-style-type: none"> <li>a. between aircraft, and</li> <li>b. on the manoeuvring area between aircraft and obstructions; and</li> </ol> </li> <li>2. expediting and maintaining an orderly flow of air traffic.</li> </ol>
Air Traffic Service	:	A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service
BATIK	:	Name of aircraft operator
Callsign	:	Unique identifiers to aircraft
Cockpit	:	The area, usually near the front of an aircraft or spacecraft, from which a pilot controls the aircraft.
Flight Number	:	A code for an airline service consisting of two-character airline designator and a 1 to 4 digit number.
GARUDA	:	Name of aircraft operator
Hearback	:	An action of listening to the readback to ascertain that the clearance or instruction has been correctly acknowledged by the flight crew and shall take immediate action to correct any discrepancies revealed by the read-back.
LION	:	Name of aircraft operator
Readback	:	a procedure whereby the receiving station repeats a received message or an appropriate part thereof back to the transmitting station so as to obtain confirmation of correct reception.
Similar Callsign	:	Another name of Callsign Confusing
WINGS	:	Name of aircraft operator

<b>Abbreviation</b>		
AIC	:	Aeronautical Information Circular
AIP	:	Aeronautical Information Publication
ATC	:	Air Traffic Control
ANC	:	Aviate Navigate Communicate
AO	:	aircraft operators
BASI	:	Bureau of Air Safety Investigation
CAIR	:	Confidential aviation incident report
CAR	:	Civil Aviation Regulation
CASA	:	Civil Aviation Safety Authority
CKG	:	Cengkareng, Jakarta
CRM	:	Cockpit (or crew) resource management
CSMC	:	Call Sign Management Cell
ICAO	:	International Civil Aviation Organization
CSST	:	Call Sign Similarity Tool
FAA	:	Federal Aviation Administration (USA)
FL	:	Flight level
FO	:	First Officer (co-pilot)
GTC	:	Ground Criterion Theory
HF	:	High frequency
IATA	:	International Air Transport Association
IFR	:	Instrument flight rules
MATS	:	Manual of Air Traffic Services
MATSC	:	Makassar Air Traffic Service Center
NAS	:	National Airspace System
NMOC	:	Network Manager operations center
RA	:	Resolution Advisory
R/T	:	Radio telephony
RTF	:	Radio Telephony Frequency
SOP	:	Standard Operational Procedure
STAR	:	Standard arrival
STCA	:	Short Term Conflict Alert
TAAATS	:	The Advanced Australian Air Traffic System
TCAS	:	Traffic Collision Avoiding System
TFF	:	Times Flight Frequency
UPG	:	Ujung Pandang
UTC	:	Universal time co-ordinated
VHF	:	Very high frequency



## Appendix 2

### Case Study: Mount Isa, 1991

On March 1 1991, two Boeing 737 aircraft were operating opposite direction services between Darwin and Brisbane on a route which passes over Mt Isa, outside of radar coverage. Ansett's VH-CZG ('Charlie Zulu Golf') was operating from Darwin to Brisbane and Australian Airlines' VH-TJD ('Tango Juliet Delta') was operating Brisbane to Darwin. Once beyond radar coverage, pilots are required to give position reports and their cruising level at certain nominated points along the route. These reports, entered on a flight strip, furnish the data with which air traffic controllers establish aircraft separation based upon altitude, distance and time standards. The controller will pass an aircraft's position report to the next responsible sector prior to the aircraft crossing the sector boundary; this allows the receiving controller time to analyse the evolving traffic situation.

CZG departed Darwin and climbed to flight level (FL) 330. Prior to reaching Tindal the pilot requested, and was issued with, a clearance to climb to FL350. The subsequent position report at Tindal indicated that the aircraft was cruising at that level. The Darwin controller passed the Tindal position report to the Brisbane controller as "flight level three five zero". Brisbane Sector 5 was being operated by a trainee and training officer, and both heard the level as "three nine zero". The trainee read back "three niner zero". When the word 'niner' was received in Darwin, a temporary loss of clarity occurred. The Darwin controller heard 'five'.

Meanwhile, TJD had departed Brisbane and climbed to FL350. Passing Swords Range, the pilot reported maintaining FL350 and estimating Mt Isa at 0020 UTC (universal time). At Ubdog, CZG contacted Brisbane Sector 5 with its position report, maintaining "flight level three five zero" and estimating Mt Isa at 0024 UTC. The trainee, now with another training officer, did not detect the level discrepancy and left the flight strip endorsement as FL390.

With CZG's call at Ubdog, both aircraft were now on the same frequency and within radio range of each other. At 0020 UTC, TJD reported overhead Mt Isa, maintaining FL350 and estimating Ubdog at 0040 UTC. Shortly after this report the pilot of CZG asked for confirmation of the cruising level of TJD. The pilot of TJD confirmed that he was maintaining FL350, whereupon the pilot of CZG advised that he also was at that level and was turning left. The two aircraft were about 20 miles apart and would have been closing at 14 to 16 miles per minute. The training officer established the error with CZG's level and cleared the aircraft to descend to FL330. Each crew saw the other aircraft as they passed at 0021.

#### **Miscommunication Issues**

The BASI investigation found that all personnel involved were properly trained, licenced and medically fit. The trainee controller, while only in his first week of training, had eight years' experience as a flight service officer. There were other aspects to this incident which are not referred to here.

#### ***Equipment***

The temporary loss of communications quality during co-ordination was determined by engineers to stem from two factors. Firstly, the trainee controller's microphone technique was such that, while the word 'niner' was spoken clearly enough for it to be recorded in Brisbane, it was not readable in Darwin. Secondly, audio levels were less than optimum in Darwin and had been for some time. These factors were enough to degrade

e the transmission of the word 'niner'.

### **Noise**

Noise was a problem in the Brisbane Area Approach Control Centre. The room is small considering the number of people working there and the Sector 5 console is in close proximity to the flight data console. The controllers, however, reported that there were no distractions to their duties.

### **Phraseologies and pronunciation**

The number nine was correctly spoken as 'niner' by all parties except the Brisbane trainee who often pronounced 'nine'. The one notable exception was when reading back the level of CZG after the Tindal co-ordination with the Darwin controller. On this occasion he said 'niner'—and it was not heard.

The Brisbane controllers misheard the flight level stated in two position reports (one by the Darwin controller and one by the pilot of CZG at Ubdog). All communications involving the number five were pronounced as 'five' by air crew and controllers alike. The number is required to be pronounced 'fife'. The word 'five' sounds like 'nine' whereas 'niner' has two syllables and is easy to distinguish from 'five' or 'fife'. The controllers were not in the habit of listening for a two-syllable word.

### **Readback error**

The Darwin recording of the readback was monitored repeatedly during the investigation but nobody was able to identify the word recorded. The controller, however, was satisfied that she had received a valid response to her co-ordination. This may be an example of *expectation error*. The system has no protection against readback/hearback errors made by any one controller.

*Sources:* BASI, 1993; Byron, 1997; Airservices Australia, 1995. in McMillan, David (1998). Miscommunications in Air Traffic Control. School of Learning and Development, Faculty of Education - Queensland University of Technology (A Project submitted in partial fulfilment of the requirements for the award of the degree of Master of Education)

## Appendix 3

### Case Study: Tenerife, 1977

Because a bomb had exploded at Las Palmas Airport in the Canary Islands, all flights had been diverted to Los Rodeos on the island of Tenerife. This airport had only one runway and inadequate parking areas to handle the sudden increase in traffic; the runway was 150 feet wide and a Boeing 747 requires 142 feet to turn 180 degrees. This meant that aircraft were parked on taxiways, obstructing others, and throwing into confusion the normal ATC ground handling procedures for taxiing, departing and arriving aircraft. Pan Am Flight PA1736 ('Clipper 1736'—a Boeing 747) landed just before Las Palmas reopened but, because it had to park behind KLM Flight KL4805 ('KLM4805', also a B747) which had off-loaded its passengers to refuel, it endured a delay of several hours, unable to move while the taxiway was obstructed.

Eventually, KLM4805 was cleared to taxi down the active runway to the end and make a 180 degree turn:

KLM: "We require backtrack on Runway 12 for takeoff on Runway 30."

ATC: "Taxi to the holding position for Runway 30...taxi into the runway...leave the runway third to your left."

KLM: "Roger, Sir. Entering the runway at this time...and we go off the runway again for the beginning of Runway 30."

ATC: "Correction...taxi straight ahead...ah...for the runway...make...ah...backtrack."

KLM: "Roger, make a backtrack...KLM4805 is now on the runway."

ATC: "Roger."

KLM (half a minute later): "You want us to turn left at Taxiway 1?"

ATC: "Negative, negative...taxi straight ahead...ah...up to the end of the runway...make backtrack."

KLM: "OK, Sir."

Pan Am was cleared to follow by entering the runway, taxi part the way down, then to vacate the runway onto a parallel taxiway; this would allow KLM4805 to take-off. Tenerife is 2073 feet above sea level and near the coast, which means clouds rather than fog float onto the airport. As KLM4805 backtracked, cloud moved in, obscuring the following B747 and blocking the controller's view of both aircraft. Pan Am was taxiing inside this cloud.

Pan Am: "Ah...we were instructed to contact you and also to taxi down the runway...is that correct?"

ATC: "Affirmative...taxi onto the runway third...third to your left."

Pan Am: "Third to the left...OK."

ATC: "Third one to the left."

The Spanish controllers English pronunciation was evidently unclear because the Captain remarked to the First Officer, "I think he said first", and the FO replied, "I'll ask him again". The controller, unused to handling B747's, had issued a taxiway exit requiring an impossible 148 degree left turn followed by another 148 degree right turn onto a 74 feet wide taxiway. Only taxiway 4 was suitable.

Pan Am: "Would you confirm that you want us to turn left at the *third* intersection?"

ATC: "The third one, Sir...one two three...third one."

Taxiing in cloud, the Pan Am crew had difficulty seeing the runway exits which caused some discussion. Meanwhile, the KLM Captain was completing the difficult manoeuvre of turning his aircraft about on the narrow runway. As his FO completed his pre-takeoff checks, the Captain opened the throttles slightly, which the FO checked with, "Wait a minute—we don't have an ATC clearance."

KLM Captain: "No...I know that. Go ahead and ask."

FO: "KLM4805 is now ready for takeoff...we're waiting for our ATC clearance."

ATC: "KLM4805...you are cleared to the Papa beacon...climb to and maintain Flight Level 90...right turn after takeoff...proceed with heading 040 until intercepting the 325 radial from Las Palmas VOR."

Captain: "Yes."

As the FO began to readback the clearance to the tower controller, the Captain released the brakes and advanced the throttles to takeoff power: "Let's go, check thrust".

KLM FO: "Roger sir, we are cleared to the Papa beacon, Flight Level 90 until intercepting the 325...we are now at takeoff."

The aircraft was already six seconds into its takeoff run.

ATC: "OK...standby for takeoff...I will call you."

Hearing this exchange the Pan Am crew were understandably alarmed.

Pan Am: "No, uh...we are still taxiing down the runway, the Clipper 1736!"

ATC: "Roger Papa Alpha 1736, report the runway clear."

Pan Am: "OK...we'll report when we're clear."

ATC: "Thankyou."

Fatefully, the Pan Am's transmissions conflicted with the controller's instructions to KLM. Instead of, "OK...standby for takeoff...I will call you", the KLM crew heard only, "OK" and a squeal of simultaneous transmissions. The rest of the transmissions between the tower and PanAm were audible on the KLM flightdeck, but by this time the aircraft was 20 seconds into its takeoff run upon which both pilots were fully concentrating. The Flight Engineer, however, was concerned:

KLM FE: "Did he not clear the runway then?"

KLM Captain: "What did you say?"

KLM FE: "Did he not clear the runway—that Pan American?"

Both pilots: "Oh, yes."

At this stage, Pan Am had missed the third taxiway intersect and was approaching taxiway 4. The crew felt uneasy on the runway in the poor visibility:

Pan Am Captain: "Let's get the hell right out of here."

FO: "Yeah...he's anxious, isn't he?"

FE: "After he's held us up for all this time, now he's in a rush."

A few seconds later, the Pan Am crew sighted lights directly ahead through the fog.

Pan Am Captain: "There he is...look at him!...goddam...that son-of-a-bitch is coming!"

Desperately he pushed all four throttles wide open and attempted to swing the Boeing 747 off the runway to the left.

Pan Am FO: "Get off! Get off! Get off!"

KLM Captain: "Oh..."

Sighting the Pan Am jet slewing across the runway, the KLM Captain hauled back on the control column to try to lift over the other jet, dragging the tail bumper on the runway. The main undercarriage and No. 4 engine sliced off Pan Am's fuselage top and the hump just behind the flightdeck. Both aircraft burst into flames. The KLM aircraft remained airborne for a few seconds before crashing back onto the runway: all passengers and crew were killed. Sixty-one passengers and crew of the Pan Am 747 survived.

### **Miscommunications Issues**

#### ***English as a second language***

The tower controller had a thick accent and pronunciation difficulties with English. He had difficulty formulating his instructions due to the non-standard nature of the operations caused by congestion.

Once, and only once, he called the Pan Am jet by its phonetic callsign "Papa Alpha 1736"; this occurred at a critical point when the KLM crew were concentrating on their takeoff. Perhaps if he had said "Clipper 1736" it might have caught their attention.

Also noted was a tendency for the controller to begin transmissions with “OK”; thus when Pan Am blocked the rest of the transmission of “standby for takeoff”, the word “OK” seemed a satisfactory response to the KLM pilots’ actions and served to confirm that all was well.

The KLM pilot’s statement of “we are now at takeoff” is a case of *code switching*. In Dutch, the verb ‘flying’ is expressed as ‘at fly’, so that “we are flying” translates as “we are at fly”. The KLM pilot meant that he was taking off; the tower controller, who had not issued a takeoff clearance, interpreted the sentence as, “we are now in the takeoff position”. The controller also used Spanish language constructions in some of his transmissions.

### ***Expectation error***

The KLM pilots were keen to depart. The pilots and the controllers *ambiguously* used the words ‘takeoff’ and ‘clearance’ in the same sentences—the pilot for the clearance request and the controller for the enroute clearance. The controller meant the instruction to be the route clearance after a takeoff clearance which was yet to come—this is standard procedure. The pilots, having completed their checks and lined up ready to depart, had wanted both clearances and that is how the KLM captain understood “you are cleared”. (It is unusual for the route clearance to be given when the aircraft is lined up. The controller had offered it earlier but the crews were too busy to accept it.)

The KLM captain had been a simulator instructor for more than ten years. In simulation, in order to get a flight underway and not waste training time, takeoff and route clearances are often issued together by the instructor; practice takeoffs often occur without any clearance whatsoever. Under pressure, the captain appears to have reverted to what he had done most often when sitting at the head of a runway. *Regression* occurs when a person reverts to first learned responses.

### ***Simultaneous transmission***

Over-transmitting blocked important instructions. With none of the parties in visual contact, the controller and the two aircraft were totally dependent upon radio communications for their situational awareness.

### ***Standard phraseology***

Neither the controller nor pilots used standard phraseologies in their communications and this contributed to misunderstandings. They were, however, those in normal daily use in civil aviation at the time.

*Sources:* Cushing, 1994; Gero, 1996; Hawkins, 1993; Job, 1994; Stewart, 1986; Weick, 1990. in McMillan, David (1998). *Miscommunications in Air Traffic Control*. School of Learning and Development, Faculty of Education - Queensland University of Technology (A Project submitted in partial fulfilment of the requirements for the award of the degree of Master of Education)

## **Appendix 4**

### **Guided Interview Questions**

Name of Interviewee :

Job : ATC Operator / Pilot

Instruction:

Before the interview began, the researcher explained the purpose of the study, the purpose of the interview and an overview of the interview questions. The researcher also shows the research permit and asks the interviewee's permission to record this interview.

(this interview lasts about 10 minutes)

1. Is there any potential for miscommunication regarding callsigns? mention!
2. What aspects do you think are most important for the callsign?
3. Mention how to overcome the possibility of miscommunication related to callsign!
4. Have you had any bad experiences with callsigns?
5. State your suggestions for this research!

Before the interview end, the researcher resumes the respondents' respond in order to make sure everything clear!

## Appendix 5

### Names of Interviewees for Research Purposes

No	Names	Identity No	Job
1	Didik Agus Suryono	10013016	ATC Senior
2	Ari Nugraha Harsawadana	10010208	ATC Senior
3	Tri Ardhi Yulianto	10010103	ATC Senior
4	Robby Karu	10010285	ATC Senior
5	Sumaryadi	10012812	ATC Senior
6	Akhmad Abdillah	10010280	ATC Senior
7	Deddy Kurniawan Bernadi	10083711	ATC Senior
8	Taufik Aleksander	10010180	ATC Senior
9	Rio Bagus Firmanto	10013032	ATC Operator
10	Wellster H Ambarita	10011731	ATC Operator
11	Dion Fatkur Rohman	10010422	ATC Operator
12	Andi Muhammad Alvian	10011568	ATC Operator
13	Ares Mardiana	10011361	ATC Operator
14	Imanuddin Kusuma Wanandya	10083439	ATC Operator
15	Rahmat Andi Herpancara	10010385	ATC Operator
16	Capt. Adi Avianto	ATPL 3649	Pilot
17	Capt. Septa Aviori	ATPL 3411	Pilot
18	Capt. Rahmat Arif Budianto	ATPL 4125	Pilot
19	FO. Donny Handoyo	CPL 7790	Pilot
20	FO. Laurentius Reatrive Prayitno	CPL 9485	Pilot



Tangerang, 31 Januari 2020

Nomor : LAP. 020/0/00 / LPPNPI / KMP. 04 / 1 / 2020  
Lampiran : 1 (satu) lembar  
Perihal : Laporan Kode Panggil yang Mirip (*similar callsign*)

Kepada Yth.

DIREKTUR ANGKUTAN UDARA  
DIREKTORAT JENDERAL PERHUBUNGAN UDARA

Di  
Tempat

1. Mengacu :
  - a. Peraturan Menteri Perhubungan Indonesia Nomor : PM 57 Tahun 2016 tentang Penyelenggaraan Alokasi Ketersediaan Waktu Terbang (*slot time*) Bandar Udara;
  - b. Peraturan Direktur Jendral Perhubungan Udara Nomor : KP 112 Tahun 2017 tentang Tata Cara Pengelolaan *Slot Time*.
2. Terkait butir 1 (satu) diatas, dengan hormat disampaikan bahwa ditemu kenali kode panggil yang mirip (*similar callsign*) dengan waktu yang berdekatan dan dapat menimbulkan kesalahan dalam memberikan instruksi (ATC) atau dalam menerima instruksi (pilot) yang akan menimbulkan BOS (*break of separation*).
3. Berikut disampaikan data kode panggil yang mirip (*similar callsign*) yang dapat dilaporkan saat ini (terlampir).
4. Demikian disampaikan, atas perhatiannya diucapkan terima kasih.



DIREKTUR OPERASI

MOKHAMMAD KHATIM

Tembusan :

- Direktur Navigasi Penerbangan, Ditjen Hubud;
- Direktur Utama Perum LPPNPI.



Lampiran Surat Direktur Operasi Perum LPPNPI

Nomor : LAP.020/0/00/LPPNPI/KMP.04/I/2020

Tanggal : 31 Januari 2020

NO	FLIGHT NUMBER	ADEP	ADES	ETD	ETA	NOMOR IJIN RUTE
1	BTK7127	HLP	BKS	09:20	10:20	AU.012/64/7/DRJU-DAU-2019
	GIA7127	PGK	PLM	08:35	09:25	AU.012/81/19/DRJU-DAU-2019
2	BTK7128	BKS	HLP	10:50	11:50	AU.012/64/7/DRJU-DAU-2019
	GIA7128	PLM	TKG	09:55	11:00	AU.012/81/19/DRJU-DAU-2019
3	TNU524	KOE	ARD	04:25	05:15	AU.012/84/23/DRJU-DAU-2019
	LKN254	DPS	ARD	02:00	04:30	AU.012/45/14/DRJU-DAU-2019
4.	QZ 697	DPS	SUB	04:15	05:15	AU.012/76/2/DRJU-DAU-2019
	QG 697	SUB	CGK	05:05	06:25	AU.012/63/3/DRJU-DAU-2019
5.	GA 323	SUB	CGK	08:55	12:25	AU.012/87/13/DRJU-DAU-2019
	QZ 323	KUL	SUB	08:55	11:45	AU.013/35/15/DRJU-DAU-2019



**KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN  
UNIVERSITAS HASANUDDIN  
FAKULTAS ILMU BUDAYA**

Jl. Perintis Kemerdekaan Km. 10, Kampus Tamalanrea, Makassar 90245  
Telepon (0411) 587223-590159, Faximili (0411) 587223  
Laman: [Ilmubudaya@unhas.ac.id](mailto:Ilmubudaya@unhas.ac.id)

Nomor : 2773/UN4.9.1/PT.01.04/2020

22 Juni 2020

Lamp. : -

Hal : Permohonan izin Penelitian

Yth. General Manager Perum LPPNPI  
Kantor Cabang MATSC  
di Tempat

Dengan hormat, kami sampaikan bahwa mahasiswa Program Magister (S-2) Bahasa Inggris Fakultas Ilmu Budaya Universitas Hasanuddin, yang tersebut di bawah ini:

**n a m a** : **Gatut Nugraha Sumarnanto Budhi**  
**nomor pokok** : **F022191018**  
**program pendidikan** : **Magister (S-2)**  
**program studi** : **Bahasa Inggris**  
**konsentrasi** : **Kebahasaan**

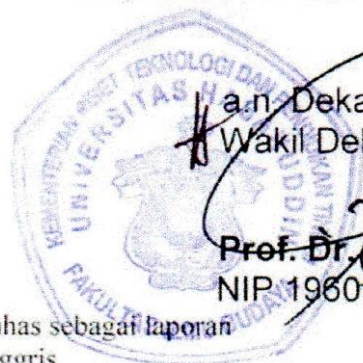
bermaksud melakukan penelitian dalam rangka penulisan tesis dengan judul:  
**PROCEDURE OF SIMILAR CALLSIGN IN VERBAL AIR GROUND COMMUNICATION**

**Pembimbing** : 1. Prof. Dr. Fathu Rahman, M.Hum. (Ketua)  
2. Dr. Sukmawaty, M.Hum. (Anggota)

**Waktu Penelitian** : Juni 2020 s.d. selesai  
**Tempat Penelitian** : Perum LPPNPI Kantor Cabang MATSC

Sehubungan dengan hal tersebut, kami mohon kebijaksanaan Bapak/Ibu kiranya berkenan memberi izin kepada yang bersangkutan untuk melakukan penelitian di unit kerja Bapak.

Atas perkenan dan kerjasama Bapak/Ibu diucapkan terima kasih.



a.n. Dekan  
Wakil Dekan Bid. Akademik, Riset, dan Inovasi,

**Prof. Dr. H. Fathu Rahman, M.Hum.**  
NIP.19601231198703025

Tembusan

1. Wakil Rektor Bidang Akademik Unhas sebagai laporan
2. Ketua Program Studi S-2 Bahasa Inggris
3. Sdr. Gatut Nugraha Sumarnanto Budhi
4. Peninggal.



## AirNav Indonesia

**Perum LPPNPI**  
 CABANG MATSC  
 Jl. Bandara Baru Sultan Hasanuddin  
 Makassar 90552  
 Sulawesi Selatan - Indonesia  
 Telp. 0411 - 481 3210  
 Fax. 0411 - 481 3717  
 www.airnavindonesia.co.id

Makassar, 01 Juli 2020

Nomor : 640/GAK/02/LPPNPI/HMS.02.03/VII/2020  
 Lampiran : -  
 Perihal : Persetujuan Izin Penelitian

Kepada Yth.  
 Wakil Dekan Bid. Akademik, Riset dan Inovasi Fakultas Ilmu Budaya  
 Universitas Hasanuddin

di  
 Makassar

1. Menunjuk Wakil Dekan Bid. Akademik, Riset dan Inovasi Fakultas Ilmu Budaya nomor 2767-2779/UN4.9.1/PT.01.04/2020 tanggal 22 Juni 2020 perihal Permohonan Izin Penelitian, disampaikan bahwa pada prinsipnya kami dapat menyetujui permohonan tersebut dengan persyaratan sebagai berikut:
  - a. Daftar Nama Terlampir
  - b. Perusahaan hanya menyiapkan fasilitas tempat melaksanakan Penelitian serta tidak menanggung segala biaya yang timbul dari pelaksanaan kegiatan tersebut.
  - c. Peserta harus mematuhi seluruh peraturan Kantor Cabang Makassar Air Traffic Services Center.
2. Demikian disampaikan, atas perhatiannya diucapkan terima kasih.

a.n. GENERAL MANAGER  
 MANAGER ADMINISTRASI & KEUANGAN  
 JUNIOR MANAGER PERSONALIA & UMUM,



ABDUL LATIF

Tembusan Yth. :

1. General Manager (sebagai laporan);
2. Manager Administrasi & Keuangan.

Lampiran Surat GM Cabang MATSC  
 Nomor : 640/GAK/02/LPPNPI/HMS.02.03/VII/2020  
 Tanggal: 01 Juli 2020

**DAFTAR NAMA PESERTA PENELITIAN**

<b>No</b>	<b>Nama</b>	<b>Nomor Pokok</b>	<b>Judul Tesis</b>
1	Didik Agus Suryono	F022191017	Waypoints Pronunciation in Air-Ground Communication
2	Mohammad Romy	F022191020	The Notion "Initials" as A Polite Refusal Strategy in Conversation Bet
3	Gatut Nugraha Sumarnanto Budhi	F022191018	Procedure Of Similar Callsign in Verbal Air Ground Communication
4	Nur Shella Firdaus	F022191002	The Importance of Understanding Technical Terminology in Coordination Between ATC and Engineering in MATSC
5	Muhammad Dzikra Yaza Pratama	F022191005	Code Switching Applied By Air Traffic Controller During Operation in MATSC
6	Andi Muhammad Alvian	F022191004	Naming Waypoint in Indonesian Airspace
7	Avian Cipta Ramadhan	F022191016	The Use of Phraseology for Communication with all Ground Station in Aeronautical Reporting Office : Politeness Studies
8	Nasya Putri Rahmanianti	F022191033	Homonymous Words in Air Traffic Control Phraseology
9	Hadibowo Wicaksono	F022191032	Light Code To Communicate With Pilot