APPENDIX A
COMMUNICATIONS GUIDANCE

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Introduction

The demanding environment associated with aerodrome operations on a runway requires that all participants accurately receive, understand, and correctly read back all air traffic control clearances and instructions. All access to a runway (even if inactive) should take place only after a positive ATC clearance has been given / received and a correct readback has been provided / accepted, and after the stop bar (where provided) has been switched off; providing a clearance in a timely manner, as the aircraft is approaching the relevant runway, will help to prevent runway incursions. This document offers guidance materials built upon Best Practices from European aerodromes that may help to protect the integrity of voice communications for operational staff working on the manoeuvring area.

Factors affecting communication breakdown

From studies of investigation reports, and from surveys regarding runway safety occurrences, it is apparent that communications issues are frequently a causal or contributory factor.

Examples of communication breakdown on the manoeuvring area include, but may not be limited to:

- Complex instructions to different aircraft;
- Controller high speech rate;
- Two different languages;
- Frequency congestion / blocked frequency;
- Use of non standard ICAO phraseology by air traffic control;
- Call sign confusion;
- Poor read-back procedure;
- Inadequate aviation English;
- Different frequencies associated with runway operations;
- Inadequate driver communication training.

Loss of communication and runway incursions.

Entering a runway (to line up or cross) or landing without a valid ATC clearance will lead to the incorrect presence of traffic on a runway and requires a runway incursion to be reported. Pilots should squawk 7600 in VMC or IMC to advise loss of communication on the manoeuvring area.

Be aware that when Communication is lost on the approach most pilots will land without a clearance in compliance with published procedures. Pilots should squawk 7600 in VMC or IMC to advise loss of communication.

ICAO doc. 4444 **AIR-GROUND COMMUNICATIONS FAILURE**
Note 2.— An aircraft equipped with an SSR transponder is expected to operate the transponder on Mode A Code 7600 to indicate that it has experienced air-ground communication failure.

Aviation language for international services

Use of Aviation English is proven to be a significant factor in the establishment and maintenance of situational awareness for all participants associated with runway operations.

ICAO Annex 1
As of 5 March 2008, aeroplane, airship, helicopter and powered-lift pilots, air traffic controllers and aeronautical station operators shall demonstrate the ability to speak and understand the language used for radiotelephony communications to the level specified in the language proficiency requirements in Appendix 1.

Appendix 1
REQUIREMENTS FOR PROFICIENCY IN LANGUAGES USED FOR RADIOTELEPHONY COMMUNICATION

1. General
Note.— The ICAO language proficiency requirements include the holistic descriptors at Section 2 and the ICAO Operational Level (Level 4) of the ICAO Language Proficiency Rating Scale in Attachment A. The language proficiency requirements are applicable to the use of both phraseologies and plain language.

2. Holistic descriptors
Proficient speakers shall:

a) communicate effectively in voice-only (telephone/radio-telephone) and in face-to-face situations;

b) communicate on common, concrete and work-related topics with accuracy and clarity;

c) use appropriate communicative strategies to exchange messages and to recognise and resolve misunderstandings (e.g. to check, confirm, or clarify information) in a general or work-related context;

d) handle successfully and with relative ease the linguistic challenges presented by a complication or unexpected turn of events that occurs within the context of a routine work situation or communicative task with which they are otherwise familiar; and

e) use a dialect or accent which is intelligible to the aeronautical community.

ICAO Annex 10 Language to be used
The air-ground radiotelephony communications shall be conducted in the language normally used by the station on the ground or in the English language.
Doc. 9432 Manual radio telephony

Runway Frequency

It is recommended that communications for all operations on a runway (landing, departing, crossing aircraft, vehicles crossing and runway inspections etc.) take place on the VHF frequency assigned for that runway; this will help to maintain high levels of situational awareness. To accommodate vehicles that are equipped with UHF radios only, frequency 'coupling' should be employed to ensure that all UHF communications associated with runway operations are simultaneously transmitted on the appropriate VHF frequency (and vice versa). When using RTF frequency coupling, Controllers (and drivers) need to be mindful of 'clipped' transmissions, where the beginning or end of the transmission is not broadcast/received.

Concerns about runway frequency congestion due to drivers using VHF can be alleviated by treating every use of the runway as a planned traffic movement, and keeping detailed discussions e.g. FOD descriptions, for another frequency.

Aerodrome Control Phraseologies

Use of established **standard ICAO phraseologies** for radio telephony communication between aircraft and ground stations is essential to avoid misunderstanding, and to reduce the time required for communication. ICAO phraseology shall be used in all situations for which it has been specified. When standardised phraseology for a particular situation has not been specified, plain language shall be used. An extract from the ICAO Standard that states this requirement is as follows:

Annex 10, Volume II
"ICAO standardized phraseology shall be used in all situations for which it has been specified. Only when standardized phraseology cannot serve an intended transmission, plain language shall be used."

All personnel involved in operations associated with runways must use clear, concise and unambiguous phraseologies. Such usage will ensure that safety levels are maintained or improved upon.

ICAO doc. 9432 Manual of Radiotelephony says
*"In the PANS-ATM [doc. 4444], it is further emphasized that the phraseologies contained therein are not intended to be exhaustive, and when circumstances differ, pilots, ATS personnel and other ground personnel will be expected to use appropriate subsidiary phraseologies which should be as clear and concise as possible and **designed to avoid possible confusion** by those persons using a language other than one of their national languages. "Appropriate subsidiary phraseologies" can either refer to the use of plain language, **or the use of regionally or locally adopted phraseologies**. Either should be used in the same manner in which phraseologies are used: clearly, concisely, and unambiguously. Additionally, **such appropriate subsidiary phraseologies should not be used instead of ICAO phraseologies, but in addition to ICAO phraseologies when required**, and users should keep in mind that many speakers/listeners will be using English as a second or foreign language.*

3.2.4 The use of plain language required when phraseologies are not available should not be taken as licence to degrade in any way good radiotelephony techniques. All radiotelephony communications should respect both formal and informal protocols dictating clarity, brevity, and unambiguity."

Example Phraseologies

Listed below are some of the relevant key ICAO phraseologies contained within those documents, applicable for operations on runways. More examples of the application of phraseologies may be found in the manual of radiotelephony ICAO doc. 9432 and Pans ATM 4444. It should be noticed that these phraseologies are for use by air traffic controllers, pilots, and when applicable, to vehicle drivers.

Special note for vehicle drivers

Doc. 4444 Phraseologies for the movement of vehicles, other than tow-tractors, on the manoeuvring area shall be the same as those used for the movement of aircraft, with the exception of taxi instructions, in which case the word "**PROCEED**" shall be substituted for the word "**TAXI**" when communicating with vehicles.

The procedure contained in ICAO doc. 4444 12.2.7 makes no provision for vehicles to be included in the process of receiving a **conditional clearance**. Vehicles may only be the subject of a conditional clearance.

Note 1: Words in parentheses ( ) indicate that specific information, such as a level, a place or a time, etc., must be inserted to complete the phrase, or alternatively that optional phrases may be used. Words in square parentheses [ ] indicate optional additional words or information that may be necessary in specific instances.

Note 2: The detailed phrases listed below do not form the complete phrases to be used, nor do they represent the total number listed in ICAO PANS/ATM (Doc 4444) where a complete listing is available in Chapter 12. They refer to those elements considered crucial to runway safety aspects.

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a. TAXI PROCEDURES

For departure

ATC (call sign) TAXI TO HOLDING POINT* [number] RUNWAY (number)

Or where detailed taxi instructions are required

ATC (call sign) TAXI TO HOLDING POINT [number] RUNWAY (number)
HOLD SHORT OF RUNWAY (number) [contact TWR]

ATC (or CROSS RUNWAY (number)) TIME (time);

It should be noted that the words "position … and / or hold" may be misunderstood by some pilots due to the previous use of non ICAO phraseology within North America, where "taxi into position and hold…" was used by ATC when issuing a line up clearance. There have been a number of runway safety occurrences with the key words 'position' and 'hold' misapplied, therefore read-backs should be very carefully monitored when using these words. See also, Holding instructions from ATC below.

ATC (call sign) TAXI VIA RUNWAY (number);

PILOT (call sign) REQUEST BACKTRACK

ATC (call sign) BACKTRACK APPROVED
ATC (call sign) BACKTRACK RUNWAY (number);

Other general instructions
Caution should be exercised when using the phrase follow, at or near runway holding points as pilots and drivers have been known to interpret this as clearance to continue following traffic as it enters or lines up on a runway.

ATC (call sign) VACATE RUNWAY
PILOT/DRIVER (call sign) RUNWAY VACATED
The Pilot or Driver may not always be sure if they are clear of the ILS sensitive area. Don't assume runway vacated means no runway re-entry for some aerodrome layouts.

ATC (call sign) EXPEDITE TAXI (reason)
PILOT/DRIVER (call sign) EXPEDITING

ATC (call sign) TAXI SLOWER (reason)
PILOT/DRIVER (call sign) SLOWING DOWN

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b. HOLDING INSTRUCTIONS FROM ATC

ATC (call sign) HOLD (direction) OF (position, runway number, etc.);
ATC (call sign) HOLD POSITION;
ATC (call sign) HOLD (distance) FROM (position) … to hold not closer to a runway than specified in Doc. 4444;
Chapter 7, 7.5.3.1.3.1
ATC (call sign) HOLD SHORT OF (position);

READ-BACK FROM PILOTS/DRIVERS

(call sign) HOLDING;
(call sign) HOLDING SHORT.

It should be noted that aircraft should not hold closer to a runway than specified in Doc. 4444; Chapter 7, 7.5.3.1.3.1.

The procedure words, ROGER and WILCO, are insufficient acknowledgement of the instructions HOLD, HOLD POSITION and HOLD SHORT OF (position). In each case the acknowledgement shall be by the phraseology (call sign) HOLDING or HOLDING SHORT, as appropriate.

c. TO CROSS A RUNWAY

PILOT/DRIVER (call sign) REQUEST CROSS RUNWAY (number…)

Note — If the control tower is unable to see the crossing aircraft or vehicle (night, low visibility, etc.), the instruction should always be accompanied by a request to report when the aircraft or vehicle has vacated the runway.

ATC (call sign) CROSS RUNWAY (number) [REPORT VACATED]

ATC (call sign) TAXI TO HOLDING POINT [number] [RUNWAY (number)] VIA (specific route to be followed), [HOLD SHORT OF RUNWAY (number)] or [CROSS RUNWAY (number)]

Note — The pilot or driver will, when requested, report "RUNWAY VACATED" when the aircraft is clear of the runway.

d. PREPARATION FOR TAKE-OFF -clearance to enter runway and await take-off clearance.

ATC (call sign) LINE UP [AND WAIT];
ATC (call sign) LINE UP RUNWAY (number);
ATC (call sign) LINE UP. BE READY FOR IMMEDIATE DEPARTURE;

Good practice read back example
Pilot AF 2515 from S3 line-up runway 27 and wait

Proposing 'be ready for immediate departure' or asking the question 'are you ready for immediate departure?' does not imply a take off clearance has been given.

The phrase 'Go ahead' (meaning pass your message) may be misinterpreted as an instruction to move the vehicle or aircraft.

e. CONDITIONAL CLEARANCES

ICAO doc. 4444 12.2.7 Conditional phrases, such as "behind landing aircraft" or "after departing aircraft", shall not be used for movements affecting the active runway(s), except when the aircraft or vehicles concerned are seen by the appropriate controller and pilot. The aircraft or vehicle causing the condition in the clearance issued shall be the first aircraft/vehicle to pass in front of the other aircraft concerned. In all cases a conditional clearance shall be given in the following order and consist of:

a) identification;
b) the condition;
c) the clearance; and
d) brief reiteration of the condition,

e.g.:
ATC "SAS 941, BEHIND DC9 ON SHORT FINAL, LINE UP BEHIND".

Note - This makes specific the need for the aircraft receiving the conditional clearance to identify the aircraft or vehicle causing the conditional clearance. e.g.

The acknowledgement of a conditional clearance must contain the condition in the read-back e.g.

PILOT BEHIND LANDING DC9 on SHORT FINAL, LINING UP BEHIND Scandinavian 941.

ATC Scandinavian 941 [that is] correct

NB: The procedure also makes no provision for vehicles to be included in the process of receiving a conditional clearance. They may only be the subject of a conditional clearance.

f. TAKE-OFF CLEARANCE

ATC (call sign) CLEARED FOR TAKE-OFF [REPORT AIRBORNE]…. Applicable for Low Visibility operations;

Best Practice to prevent wrong runway selection, or when more than one runway in use, always use the runway designator in the instruction.

ATC (call sign) RUNWAY (number) CLEARED FOR TAKE-OFF

When take-off clearance has not been complied with.

ATC (call sign) TAKE OFF IMMEDIATELY OR VACATE RUNWAY [(instructions)];
ATC (call sign) TAKE OFF IMMEDIATELY OR HOLD SHORT OF RUNWAY

Or to cancel a take-off clearance.

ATC (call sign) HOLD POSITION, CANCEL TAKE-OFF I SAY AGAIN CANCEL TAKE-OFF (reasons);
PILOT (call sign) HOLDING;

Or to stop a take-off after an aircraft has commenced take-off roll.

ATC (call sign) STOP IMMEDIATELY [(repeat aircraft call sign) STOP IMMEDIATELY]
PILOT (call sign) STOPPING;

Aerodrome Control Phraseology – READ-BACK

Of equal importance to the usage of correct phraseologies is the need to obtain the required read-back, in the order required and accurately. Listed below are the provisions provided in the relevant ICAO documents pertaining to this safety critical element of runway operations, together with the paragraph number in the ICAO document.

In PANS-ATM the regulations regarding read-backs are stated.

Read-back of clearances and safety-related information

The flight crew shall read-back to the air traffic controller safety-related parts of ATC clearances and instructions which are transmitted by voice. The following items shall always be read-back:

a. ATC route clearances;

b. clearances and instructions to enter, land on, take off from, hold short of, cross and backtrack on any runway; and

c. runway-in-use, altimeter settings, SSR codes, level instructions, heading and speed instructions and, whether issued by the controller or contained in ATIS broadcasts, transition levels.

Other clearances or instructions, including conditional clearances, shall be read-back or acknowledged in a manner to clearly indicate that they have been understood and will be complied with.

The controller shall listen to the read-back 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.

Studies of air ground communication practices have shown that incomplete read-backs may mask a misunderstanding. Incorrect read-backs show there is a misunderstanding. Air traffic control must challenge incomplete or incorrect read-backs.

Avoiding Call Sign Confusion

The use of **full call-signs of all traffic** operating on or in close proximity to a runway has been identified as a critical element in enhancing safety for runway operations. Whilst the ICAO provisions allow for use of abbreviated call-signs in certain circumstances, it is deemed Best Practice not to apply any shortening of call-sign in this situation.

Call sign confusion is not restricted to similar call signs between aircraft. Confusion may occur between aircraft and vehicle call signs. Confusion with infrastructure may also be part of call sign confusion incidents.

Runway Incursion Example:
An aircraft with the call sign "delta" has to taxi to a position called "delta 2" later split in "delta 2-2" And RWY 02 (RWY 2 for USA pilots) in use;

ATC to outbound taxiing traffic "**Delta xxx cross runway 07R and continue straight ahead to D2 (a taxiway**)"
Pilot Delta xxx "**Cross runway 7 right to the runway 2" (unchallenged incorrect readback)**
ATC "Delta xxx take position on D22 please" (non ICAO phraseology)
Pilot Delta xxx "**Affirm on D22**"

ATC to landing traffic "**RJ85 go-around I say again go-around**"
Pilot 85 "**Going around RJ85**"

Pilot Delta interpreted these instructions as Delta to (runway) 02.

ICAO DOC 4444
- TRANSMISSION OF NUMBERS
  - RWY = each digit separately
  - i.e. RWY02 = runway zero two – runway two
- TAXI PROCEDURES
  - TAXI TO HOLDING POINT RWY # #
    HOLD SHORT OF RWY # # (was not said by the controller)
- PREPARATION FOR T/O
  - CLEARANCE TO ENTER A RWY MUST BE OBTAINED:
  - LINE UP (AND WAIT) RWY # #

Other points of confusion include **aircraft type misidentification** and **aircraft livery confusion** where the livery is not representative of the aircraft call sign.

Communication techniques - general

Detailed below are the relevant provisions laid down in Annex 10, with regard to radio transmission guidelines and techniques.

Speech-transmitting techniques should be such that the highest possible intelligibility is incorporated in each transmission. Fulfilment of this aim requires that flight crew and ground personnel should:

a. Enunciate each word clearly and distinctly;

b. Maintain an even rate of speech. 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. A slight pause preceding and following numerals makes them easier to understand;

c. Maintain the speaking volume at a constant level;

d. Be familiar with the microphone operating techniques particularly in relation to the maintenance of a constant distance from the microphone if a modulator with a constant level is not used;

e. Suspend speech temporarily if it becomes necessary to turn the head away from the microphone.

What to do if uncertain of your position on the manoeuvring area

Pilots and airside manoeuvring area drivers do not knowingly enter a runway without a valid ATC clearance. When this happens, it is most likely because the pilot or driver is uncertain of their position and situational awareness has been lost. ICAO has developed a procedure about what to do if you are a pilot, driver or air traffic controller with a team member who does not know that they are on a runway or taxiway.

ICAO doc. 4444
"UNCERTAINTY OF POSITION ON THE MANOEUVRING AREA
Except when a pilot is in doubt as to the position of the aircraft with respect to the manoeuvring area shall immediately:

a. *stop the aircraft; and*
b. *simultaneously notify the appropriate ATS unit of the circumstances (including the last known position).*

In those situations where a pilot is in doubt as to the position of the aircraft with respect to the manoeuvring area, but recognizes that the aircraft is on a runway, the pilot shall immediately:

a. *notify the appropriate ATS unit of the circumstances (including the last known position);*
b. *if able to locate a nearby suitable taxiway, vacate the runway as expeditiously as possible, unless otherwise instructed by the ATS unit; and then,*
c. *stop the aircraft.*

A vehicle driver in doubt as to the position of the vehicle with respect to the manoeuvring area shall immediately:

a. *notify the appropriate ATS unit of the circumstances (including the last known position);*
b. *simultaneously, unless otherwise instructed by the ATS unit, vacate the landing area, taxiway, or other part of the manoeuvring area, to a safe distance as expeditiously as possible; and then,*
c. *stop the vehicle.*

7.4.1.5.4 In the event the aerodrome controller becomes aware of an aircraft or vehicle that is lost or uncertain of its position on the manoeuvring area, appropriate action shall be taken immediately to safeguard operations and assist the aircraft or vehicle concerned to determine its position."

Improving communications for little or no cost

■ Introduce a method for self-checking to ensure ICAO compliant phraseology is used for air traffic controllers e.g. by taking the opportunity to listen to short samples of own R/T and comparing what was said with ICAO doc. 4444 phrases on a regular basis;

■ Ensure a Cockpit friendly method to record line-up / crossing clearances is available;

■ Implement a method for manoeuvring area drivers to record when a clearance to enter or cross a runway is received;

■ ATC clearances must be issued early enough to ensure that they are transmitted to the aircraft in sufficient time for it to comply with them;

■ Raise awareness that ICAO compliant communication practices help to prevent ground navigation errors;

■ One best practice is to implement a systematic evaluation of the R/T loading; it may lead to frequency splitting;

■ Consider Training recommendations for pilots, controllers and vehicle drivers, including practical exams.