**CIVIL AVIATION AUTHORITY OF SRI LANKA**
**AVIATION SAFETY NOTICE**

| ASN No 109 | Ref No: OPS/2009/08 | File Ref: OP/21/10/1/9 |
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Recipients

1. Holders of Air Operator Certificates issued by DGCA for Commercial Air Transport Operations.
2. Prospective applicants for Air Operator Certificates for Commercial Air Transport Operations.

01.Subject : **Guidance on Flight Crew Procedures During Taxi Operations.**

02.Nature : Advisory

03.Issue no : 01

04.Status : New

05. Effective date : With immediate effect

06. Validity : Until Further Notice

07.Contact person : Inquiries may be directed, preferably by letter to, Deputy Director (Operations), Civil Aviation Authority, No.64, Galle Road, Colombo 03, Sri Lanka. Telephone: +94 11 2399534.

08.Availability : A copy of this document is available on web site- **www.caa.lk** and for reference at the technical library of Civil Aviation Authority. Copies can be collected at reproduction cost from the library.

09.Applicability :

I. Holders of Air Operator Certificates issued by DGCA.

II. Prospective applicants for Air Operator Certificates.

10. Comments : Comments (if any) on the contents of this Aviation Safety Notice (ASN) may be forwarded to the contact person. However the Aviation Safety Notice will come into effect on the date shown therein notwithstanding any objection or comment made by any person or party unless and until an amendment to the Aviation Safety Notice is issued afresh by the Director General of Civil Aviation.

11.Notice : Any operator who is engaged in commercial air transport operation under an Air Operator Certificate issued by DGCA Sri Lanka is recommended to adhere to the guidelines specified in the Attachment hereto.

12.Histroy of Revision : nil

13. Related ASNs . ASN 042

14.Action Required : Holders of Air Operator Certificates issued by the DGCA for Commercial Air Transport Operations are hereby instructed to implement appropriate measures to give effect to the guidelines specified in the attachment hereto, and forward to the DGCA **within 2 months period from the effective date mentioned above**, a "Declaration of Conformance" which indicates the degree of compliance with each item detailed in the attachment. In the Declaration of Conformance, the operator shall use the following terminology to indicate their position with regard to each such item.

**"Noted"** - to indicate that the operator has made note of the requirement

**"Noted & Complied"** - to indicate the operator has made note of the requirement and action has been taken to comply with the requirement. **In such a situation the operator shall explain the method of compliance by giving the necessary cross references to the provisions either in its Operations Manual or any other manual applicable.**

15. Checklist : List of current ASN numbers are as follows.

| ASN No | Issue No | Date of Applicability | Remarks |
|---|---|---|---|
| ASN002 | 01 | 10.03.2000 | nil |
| ASN003 | 01 | 18.08.2000 | nil |
| ASN004 | 01 | 13.02.2001 | nil |
| ASN005 | 01 | 26.03.2001 | nil |
| ASN007 | 01 | 15.09.2001 | nil |
| ASN008 | 02 | 16.11.2006 | Replaced ASN no 008 issue no 01 |
| ASN009 | 01 | 18.02.2002 | nil |
| ASN010 | 01 | 18.02.2002 | nil |
| ASN011 | 01 | 18.02.2002 | nil |
| ASN012 | 01 | 18.02.2002 | nil |
| ASN013 | 01 | 08.02.2002 | nil |
| ASN014 | 01 | 01.03.2002 | nil |

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|---|---|---|---|
| ASN015 | 01 | 01.03.2002 | nil |
| ASN016 | 01 | 01.03.2002 | nil |
| ASN017 | 02 | 10.03.2005 | Replaced ASN no 017 issue no 01 |
| ASN018 | 01 | 20.03.2002 | nil |
| ASN019 | 01 | 01.04.2002 | nil |
| ASN021 | 01 | 01.04.2002 | nil |
| ASN022 | 01 | 08.04.2002 | nil |
| ASN023 | 01 | 01.06.2002 | Replaced ASN no 003 |
| ASN024 | 01 | 02.09.2002 | nil |
| ASN025 | 02 | 15.10.2002 | Replaced ASN no 001 |
| ASN026 | 01 | 15.10.2002 | nil |
| ASN027 | 01 | 20.12.2002 | nil |
| ASN028 | 01 | 12.03.2003 | nil |
| ASN029 | 01 | 21.03.2002 | nil |
| ASN030 | 01 | 10.07.2002 | nil |
| ASN031 | 01 | 15.072003 | Replaced ASN no 006 |
| ASN032 | 01 | 25.07.2003 | nil |
| ASN033 | 02 | 25.08.2005 | Replaced ASN no 033 issue no 01 |
| ASN034 | 01 | 11.09.2003 | nil |
| ASN035 | 01 | 12.09.2003 | nil |
| ASN036 | 01 | 12.09.2003 | nil |
| ASN037 | 01 | 13.10.2003 | nil |
| ASN038 | 01 | 07.05.2004 | nil |
| ASN039 | 04 | 19.08.2008 | Replaced ASN no 039 issue no 03 |
| ASN040 | 01 | 07.06.2004 | nil |
| ASN041 | 01 | 16.06.2004 | nil |
| ASN042 | 04 | 10.07.2009 | Replaced ASN no 042 issue no 03 |
| ASN043 | 02 | 12.08.2004 | Amendment to ASN no 013 |
| ASN044 | 02 | 13.03.2006 | Replaced ASN no 044 issue no 01 |
| ASN045 | 02 | 05.01.2007 | Replaced ASN no 045 issue no 01 |
| ASN046 | 02 | 13.07.2009 | Replaced ASN no 046 issue no 01 |
| ASN047 | 03 | 05.01.2007 | Replaced ASN no 047 issue no 02 |
| ASN048 | 02 | 05.01.2007 | Replaced ASN no 048 issue no 01 |
| ASN049 | 01 | 20.09.2004 | nil |
| ASN051 | 01 | 20.09.2004 | nil |
| ASN052 | 01 | 20.09.2004 | nil |
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| ASN054 | 03 | 16.07.2009 | Replaced ASN no 054 issue no 02 |
| ASN055 | 04 | 17.07.2009 | Replaced ASN no 055 issue no 03 |
| ASN056 | 02 | 20.07.2009 | Replaced ASN no 056 issue no 01 |
| ASN057 | 01 | 01.12.2005 | nil |
| ASN058 | 03 | 21.07.2009 | Replaced ASN no 058 issue no 02 |
| ASN059 | 01 | 22.07.2009 | nil |
| ASN060 | 02 | 05.08.2005 | Replaced Page no 01 of the attachment to the ASN no 060 issue no 01 |
| ASN061 | 02 | 05.08.2005 | Replaced Page no 01 of the attachment to the ASN no 061 issue no 01 |
| ASN062 | 01 | 01.03.2005 | nil |
| ASN063 | 01 | 20.12.2004 | nil |
| ASN065 | 01 | 06.04.2005 | nil |
| ASN066 | 01 | 16.05.2005 | nil |
| ASN067 | 01 | 16.05.2005 | nil |
| ASN068 | 01 | 18.05.2005 | nil |
| ASN069 | 01 | 18.05.2005 | nil |
| ASN070 | 01 | 18.05.2005 | nil |
| ASN071 | 01 | 18.05.2005 | nil |
| ASN072 | 01 | 19.05.2005 | nil |

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|---|---|---|---|
| ASN073 | 01 | 19.05.2005 | nil |
| ASN074 | 01 | 19.05.2005 | nil |
| ASN075 | 01 | 19.05.2005 | nil |
| ASN076 | 01 | 16.06.2005 | nil |
| ASN077 | 01 | 08.08.2005 | nil |
| ASN078 | 01 | 21.12.2005 | nil |
| ASN079 | 01 | 16.09.2005 | nil |
| ASN080 | 01 | 07.11.2005 | nil |
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| ASN082 | 01 | 23.11.2005 | nil |
| ASN083 | 01 | 01.12.2005 | nil |
| ASN084 | 01 | 16.12.2005 | nil |
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| ASN087 | 01 | 06.04.2006 | nil |
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| ASN092 | 01 | 09.11.2007 | nil |
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| ASN101 | 01 | 28.01.2008 | nil |
| ASN 102 | 01 | 04.03.2008 | nil |
| ASN 103 | 01 | 01.08.2008 | nil |
| ASN 104 | 01 | 28.08.2008 | nil |
| ASN 105 | 01 | 07.08.2008 | nil |
| ASN 106 | 01 | 03.12.2008 | nil |
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# FLIGHT CREW PROCEDURES DURING TAXI OPERATIONS

## 1. PURPOSE.

This Aviation Safety Notice (ASN) provides guidelines for the development and implementation of standard operating procedures (SOP) for conducting safe aircraft operations during taxiing. It is intended for use by persons operating aircraft where two or more pilots are in the cockpit. The Director General of Civil Aviation recommends that these guidelines become an integral part of all standard operating procedures, flight operations manuals, and formal flight crewmember training programs. The use of flight-crew SOPs should be emphasized and employed during all phases of a flight crewmember's aircraft ground and flight training programs. Appendices 1 through 7 of this ASN contain examples of SOPs that are identical or similar to some SOPs currently in use. These appendices are not directive or prescriptive in nature and do not represent a rigid CAA view or best practices. SOPs may vary among fleets and among certificate holders and may change over time. Operators may integrate the information contained in appendices1 through 7 into their fleet specific, route-specific and equipment-specific Operations and Checklists. They are shown to denote how the SOPs and best practices can be integrated into the context of specific flight operations.

## 2. FOCUS.

This guidance focuses on the activities occurring within the cockpit (e.g., planning, communicating, coordinating), as opposed to the actual control of the aircraft (e.g., steering, maneuvering). Taxi operations present distinct challenges and requirements not found in other phases of flight operations. These distinct challenges are elaborated, when necessary, throughout the guidance. A section is included on the use of exterior aircraft lights during ground operations which make an aircraft more conspicuous to other flight-crew.

## 3. RELATED MATERIAL INCLUDING TRAINING MATERIAL.

The following material has been developed by ICAO. Operators may wish to review the training information contained therein and adapt the material as required for use as part of their training programme.

a. ICAO Runway Safety Tool Kit
b. European Runway Safety Awareness Material
c. FAA Taxi 101
d. FAA Runway Safety – Head UP, Hold Short, Fly Right

## 4. BACKGROUND.

In the past, the process of getting to and from the runway was relatively simple compared to other phases of flight, and little attention was given to formalizing flight-crew procedures during taxi operations. Also, training for flight deck procedures during aerodrome surface operations has not been uniform among organizations, and has frequently received inadequate attention. As a result, a variety of procedures and techniques evolved primarily based on what flight crewmembers have observed or what just seemed right at the time. This lack of structure, standardization, and formal training is inconsistent with the goal of increasing the safety and efficiency of aircraft movement on the aerodrome surface.

a. Recently, increases in traffic and expansion at many aerodromes have created complex runway and taxiway layouts. This additional complexity has made aerodrome surface operations more difficult and potentially more hazardous than they were in the past. To increase safety and

b. 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. This can be accomplished through SOPs that require the flight-crew to be prepared to devote their attention to only essential tasks while the aircraft is in motion. This requires the development and formalized teaching of safe operating procedures during taxi operations.

c. In developing these SOPs, it is important to consider existing flight crewmember workload prior to take off and before landing. Considerations should be given to some tasks that make up the normal workload of flight-crew, such as accomplishing checklists, configuring the aircraft for takeoff and landing, programming Flight Management Systems and managing communications with the operator and Air Traffic Control (ATC). The more complex the activities within the cockpit work environment, the greater is the need for explicit and clear standard operating procedures (SOPs). The overall goal is for the operators to develop standardized flight-crew procedures that will increase the flight-crew's awareness but will not increase their workload while the aircraft is taxiing.

**5. FLIGHTCREW PROCEDURES.**

a. General

The potential for runway incidents and accidents can be reduced through adequate planning, coordination, and communication. The following guidelines are intended to help flightcrews cope more effectively with current aerodrome conditions during taxi operations. All flight crewmembers, regardless of whether they are designated as the pilot in command (PIC), second in command (SIC), or the flight engineer (FE), will benefit from this guidance. The guidelines are grouped into six major categories: Planning, Situational Awareness, Use of Written Taxi Instructions, Intra-cockpit Verbal Coordination, ATC/Pilot Communication, and Taxiing.

b. Planning

(1) Thorough planning for taxi operations is essential for a safe operation. Flight-crew should give as much attention to the planning of the aerodrome surface movement portion of the flight as they give to the planning of the other phases of flight. Make planning for taxi operations an integral part of the fligh-tcrew's flight planning process. Planning should be done in two main phases. First, anticipate aerodrome surface movements by doing pre-taxi or pre-landing planning based on information on the automatic terminal information service (ATIS), previous experience at that aerodrome, and review of the aerodrome chart. Second, once taxi instructions are received, the pre-taxi plans should be reviewed and updated as necessary. It is essential that the updated plan is understood by all flight crewmembers.

**CAUTION: A potential pitfall of pre-taxi and pre-landing planning is setting expectations and then receiving different instructions from ATC. Flight-crew need to ensure that they follow the clearance or instructions that are actually received, and not the one they expected to receive.**

(2) The following guidance should be used to conduct a briefing of all flight crewmembers.

(a) How familiar are the flight crewmembers with the aerodrome? Has anyone flown out of or into the aerodrome recently? Might there have been changes made at the aerodrome recently? Remember to review the latest Notices to Airmen (NOTAM) for both the departure and arrival aerodromes for information concerning construction and/or taxiway/runway closures.

(b) Take some time and study the aerodrome layout. An aerodrome chart must be readily available for use by the pilots. Check the expected taxi route against the aerodrome chart or aerodrome ground movement chart. Pay special attention to any unique or complex intersections along the taxi route. While planning for departure, be sure to consider the likely inbound taxi route at the arrival aerodrome as well. Flight-crew should identify critical times and locations on the taxi route (transitioning through complex intersections, crossing intervening runways, entering and lining up on the runway for takeoff, and approaching and lining up on the runway for landing) where verbal coordination between the PIC and the SIC will be important to ensure correct aircraft navigation and crew orientation.

(c) The flight-crew should plan the timing and execution of aircraft checklists and company communications at the appropriate times and locations so the pilot who is not taxiing the aircraft can be available to participate in verbal coordination with the pilot who is taxiing the aircraft. This action is needed to confirm compliance with ATC taxi instructions at the appropriate times and locations. When planning these tasks, flight-crew should also consider the anticipated duration of the taxi operation, the locations of complex intersections and runway crossings, and the visibility along the taxi route. If at all possible, during low visibility operations, flight-crew should only conduct pre-departure checklists when the aircraft is stopped.

c. Situational Awareness

(1) When conducting taxi operations, flight-crew need to be aware of their situation as it relates to other aircraft operations going on around them as well as to other vehicles moving on the aerodrome. The flight-crew should know the aircraft's precise location on the aerodrome. Sometimes, this is a challenge, especially when flight-crew are at an unfamiliar aerodrome, the aerodrome layout and taxi routes are complex, or the visibility is poor. It is important for the flight-crew to understand and follow ATC instructions and clearances, to have and use an aerodrome chart, and to know and use all of the visual aids available at the aerodrome, such as the signs, markings, and lighting, when taxiing on the aerodrome.

(2) Flight-crew should use a "continuous loop" process for actively monitoring and updating their progress and location during taxi. This includes knowing the aircraft's present location and mentally calculating the next location on the route that will require increased attention. For example, a turn onto another taxiway, an intersecting runway, or any other transition points. As the "continuous loop" is updated, flight crewmembers should verbally share relevant information with each other.

(a) Situational awareness is enhanced by monitoring ATC instructions/clearances

issued to other aircraft.

(b) Prior to entering or crossing any runway, scan the full length of the runway, including approach areas. Flight crewmembers should verbally confirm scan results with each other and aircraft movement should be stopped if there is any difference or confusion on the part of any flight crewmember about the scan results.

**CAUTION: Do not stop on a runway. If possible, taxi off the runway and then initiate communications with ATC to regain orientation.**

(c) Be especially vigilant when instructed to line up and wait, particularly at night or during periods of reduced visibility. Do not remain in position and hold on the departure runway for an extended period without direct communication from ATC. If any flight crewmember is uncertain about any ATC instruction or clearance, query ATC immediately. If anyone suspects radio problems and weather conditions permit, attempt to observe the tower for light signals.

(d) Use extra caution when directed to use a runway as a taxiway, especially during reduced visibility conditions.

(e) Use the utmost caution after landing on a runway that intersects another runway or on a runway where the exit taxiway will shortly intersect another runway. All flight crewmembers must have a common understanding of ATC's instructions and expectations regarding where the aircraft is to stop and must be able to identify the appropriate hold points. Immediately advise ATC if there is any uncertainty about the ability to comply with any of their instructions.

**CAUTIONS:**

1 **After landing, when you are on an exit taxiway that is between parallel runways, taxi your aircraft clear of the landing runway unless you are constrained by a hold-short line associated with the adjacent parallel runway.**
2 **Unless otherwise instructed by ATC, taxi clear of the landing runway even if that requires you to cross or enter a taxiway/apron area.**
3 **Never enter a runway without specific authorization. When in doubt, contact ATC.**

(f) After landing and exiting the runway, nonessential communications and nonessential flight-crew actions should not be initiated until clear (on the inbound side) of all runways in accordance with sterile cockpit procedures.

d. Use of Written Taxi Instructions

At many aerodromes, taxi instructions can be very complex, involving numerous turns and transitions, as well as runway crossing and hold short instructions. During these aerodrome surface operations, pilots are very busy with a variety of cockpit duties and responsibilities that compete for their attention. Misunderstanding or forgetting any part of the taxi instructions can lead to an embarrassing or unsafe situation. Writing down taxi instructions,

especially complex instructions, can reduce a pilot's vulnerability to forgetting part of a complex instruction and can be used to support aerodrome surface operations as follows:

(1) For use as a reference for reading back the instructions to ATC.
(2) For crewmember coordination on the assigned runway and taxi route.
(3) For a short pre-taxi or pre-landing briefing on the pending aerodrome surface operation.
(4) As a means of reconfirming the taxi route and any restrictions at any time during the aerodrome surface operation.

**NOTE: While written taxi instructions are a good operating technique, common sense and flexibility should be used in determining the crew's need for them at a specific aerodrome. For example, if the departure runway is very near the aircraft parking location, or if the crew has used the same taxi route numerous times in the previous days, it may only be necessary to record the basic elements of the taxi clearance. However, where the taxi instructions are complex or the crew is unfamiliar with the aerodrome layout, a verbatim transcription of all instructions is desirable. Additionally, individual pilots may chose to develop a set of symbols and shorthand notations which allow them to clearly record and later recall key items in the taxi instructions.**

e. Intra-flight deck/cockpit Verbal Coordination

It is essential that the flight-crew correctly understand and agree on all ATC ground movement instructions. Any misunderstanding or disagreement should be resolved to the satisfaction of all flight crewmembers before taxiing the aircraft. It is the verbal aspect of this coordination that is most significant. It is not enough to assume that all flight crewmembers have heard and understood instructions correctly. A common understanding can be enhanced by one flight crewmember repeating the instructions verbally and getting agreement on the content and intent from the other flight crewmember(s). Any persistent disagreement or uncertainty among crewmembers should be resolved by contacting ATC for clarification. When flight crewmembers verbally confirm their understanding of the instructions, they then have a chance to discover and correct any misunderstandings and thus prevent hazardous situations from developing. This verbal coordination/agreement should be accomplished:

(1) When ATC issues taxi instructions for a departure, the flight-crew should refer to the aerodrome diagram, coordinate verbally, and agree on the assigned runway and taxi route, including any instructions to hold short of or cross an intersecting runway.

(2) When ATC issues landing instructions, the flight-crew should coordinate verbally and agree on the runway assigned by ATC, as well as any restrictions, such as hold short points of an intersecting runway after landing.

(3) After landing and exiting the runway, the flight-crew should coordinate verbally and agree on the ATC taxi instructions to the aircraft's parking area, including any instructions to hold short of or cross an intersecting runway.

(4) At complex intersections, the flight-crew should verbally coordinate to be sure that the intersection is correctly identified and that the aircraft is transitioning through the

intersection to the correct taxiway.

(5) When approaching an intersecting runway, the flight-crew should verbally coordinate in order to identify the runway. They should also verbally review the ATC instructions as to whether they are to hold short of or cross the runway.

(6) Before crossing any runway or entering a runway for takeoff or for landing, both pilots should visually scan to the left and to the right, including the full length of the runway and its approach paths, and coordinate verbally that the scan area is or is not clear.

(7) Before entering a runway for takeoff, the flight-crew should verbally coordinate to ensure correct identification of the runway and receipt of the proper ATC clearance to use it. Similar verification should be performed during approach to landing.

(8) When it becomes necessary for a flight crewmember to stop monitoring any ATC frequency, he or she should tell the other flight crewmember(s) when stopping and resuming the monitoring of the ATC frequency. Any instructions or information received or transmitted during that flight crewmember's absence from the ATC frequency should be briefed and reviewed upon his or her return.

(9) When the pilot not taxiing the aircraft focuses his or her attention on instruments in the cockpit, such as entering data into the aircraft's Flight Management System, and, consequently, is not able to visually monitor the aircraft's progress, he or she should verbally notify the pilot taxiing the aircraft. Likewise, notification should be made when that flight crewmember has completed his or her task and is again able to visually monitor the taxi operation.

f. ATC/-Flight-crew Communication.

The primary way the flight-crew and ATC communicate is by voice. The safety and efficiency of taxi operations at aerodromes with operating control towers depend on this "communication loop." Controllers use standard phraseology and require readbacks and other responses from the flight-crew in order to ensure that clearances and instructions are understood. In order to complete the "communication loop," the controllers must also clearly understand the flight-crew's read back and other responses. The flight-crew can help enhance the controller's understanding by responding appropriately and using standard phraseology. The approved flight crewmember training programs, and operational manuals provide information for flight-crews on standard ATC phraseology and communications requirements. Some of the most important guidelines that contribute to clear and accurate communications are included here.

(1) Maintain a "sterile" cockpit.Flight crewmembers must be able to focus on their duties without being distracted by non-flight related matters, such as eating meals, engaging in non-essential conversation, or reading material not related to the safe and proper operation of the aircraft.

(2) Use standard ATC phraseology at all times in order to facilitate clear and concise ATC/flight-crew communications.

(3) Focus on what ATC is instructing. Do not perform any non-essential tasks while communicating with ATC.

(4) Readback all hold short and runway crossing instructions and clearances, including the runway designator.

**NOTE: Air traffic controllers are required to obtain from the pilot a readback of all runway hold short instructions.**

(5) Readback all takeoff and landing clearances, including the runway designator.

(6) Clarify any misunderstanding or confusion concerning ATC instructions or clearances to the satisfaction of all flight crewmembers.

g. Taxiing

This paragraph will not discuss speed management, steering, or maneuvering the aircraft, but will suggest some good practices regarding other cockpit activities during taxi.

(1) Prior to taxiing, a copy of the aerodrome chart should be available for use by the flight-crew.

**NOTE: A flight crewmember --other than the pilot taxiing the aircraft should follow the aircraft's progress on the aerodrome chart to ensure that the instructions received from ATC are being followed by the pilot taxiing the aircraft.**

(2) The aircraft's compass or heading display is an excellent tool, as a supplement to visual orientation, for confirming correct taxiway or runway alignment. Refer to it as frequently as necessary, but especially at complex intersections and where the takeoff ends of two runways are close to one another.

(3) Low visibility conditions increase the challenge of safely moving the aircraft on the aerodrome surface. Although visibility is technically designated as "low" when the runway visual range (RVR) falls below 400 meters (1200 feet), visibility along the taxi route may be considerably less than the runway visibility. Use all resources available, including heading indicators, aerodrome signs, markings and lighting, and aerodrome charts to the fullest extent possible in order to keep the aircraft on its assigned taxi route.

(4) Anytime the flight-crew becomes uncertain as to the aircraft's location on the aerodrome movement area, stop the aircraft and immediately advise ATC. If necessary, request progressive taxi instructions. The flight-crew should give ATC any information available about their position, such as signs, markings, and landmarks.

**CAUTION: Do not stop on a runway. If possible, taxi off the runway and then initiate communications with ATC to regain orientation.**

(5) When cleared to takeoff, or to cross a runway, or when exiting a runway, do so in a timely

manner. Inform ATC of any anticipated delay.

(6) Some cockpit displays of traffic information [(such as some implementations of the Airbone Collision Avoidance System (ACAS) / Traffic Alert and Collision Avoidance System (TCAS)] have the capability and sufficient resolution to enable the display of traffic behind an aircraft. When pilots are holding in position, they should consider displaying traffic landing behind them to increase their awareness of the traffic situation.

(7) When holding in position at night, pilots should consider lining up slightly to the left or right of centerline (approximately 3 feet) to better enable a landing aircraft to visually differentiate the holding aircraft from runway lights.

(8) Last-minute turnoff instructions from the tower should not be accepted unless the pilot clearly understands the instructions and is certain that he/she can comply.

(9) After landing, flight-crew should not exit onto another runway without ATC authorization.

**6. USE OF EXTERIOR AIRCRAFT LIGHTS TO MAKE AIRCRAFT MORE CONSPICUOUS**

a. General

(1) Exterior aircraft lights may be used to make an aircraft operating on the aerodrome surface more conspicuous. Pilots may use various combinations of exterior lights to convey their location and intent to other pilots. Certain exterior lights may also be used in various combinations to signal whether the aircraft is on a taxiway or on a runway, in position on the runway but holding for takeoff clearance, crossing an active runway, or moving down the runway for takeoff.

(2) Because aircraft equipment varies, flight-crew are cautioned not to rely solely on the status of an aircraft's lights to determine the intentions of the flight-crew of the other aircraft. Additionally, flight-crew must remember to comply with operating limitations on the aircraft's lighting systems.

b. Exterior Lights

To the extent possible and consistent with aircraft equipage, operating limitations, and flight-crew procedures, illuminate exterior lights as follows:

(1) Engines running. Turn on the rotating beacon whenever an engine is running.

(2) Taxiing. Prior to commencing taxi, turn on navigation, position, anti-collision, and logo lights. Strobe lights should not be illuminated during taxi if they will adversely affect the vision of other pilots or ground personnel.

(3) Crossing a runway. All exterior lights should be illuminated when crossing a runway.

(4) Entering the departure runway for takeoff. When entering a runway to takeoff, or when lining up and wait for takeoff, illuminate one or more landing lights and all other exterior lights. Strobe lights should not be illuminated if they will adversely affect the vision of other pilots.

(5) Takeoff. Turn on all remaining landing lights when takeoff clearance is received, or when commencing take off roll at an aerodrome without an operating control tower.

**7. SUMMARY.**

a. Taxi operations require constant vigilance on the part of the entire flight-crew. Each flight crewmember needs to be continually aware of the movement and location of other aircraft and ground vehicles. Taxi operations require the same planning, coordination, and proper execution as other phases of flight operations. Sterile cockpit discipline is always appropriate while taxiing, even under normal weather conditions.

b. During low-visibility taxi operations, additional vigilance is absolutely essential. Flight-crew must pay particularly close attention to instructions from ATC and must insist on correct readback and hearback. Additionally, flight-crew should pay close attention to readback and hearback between ATC and other aircraft. Any ambiguity or uncertainty should be promptly resolved by clarification with ATC. When clear of an active runway, flight-crew should be prepared to stop in position to resolve any questions about position on the aerodrome or clearance from ATC.

c. Safe aircraft operations can be accomplished and incidents eliminated if flight-crew are properly trained and correctly accomplish standard taxi operating procedures and practices.

**NOTES ON THE USE OF APPENDICES**

Appendices 1 through 7 contain examples of standard operating procedures (SOP) that are identical or similar to some SOPs currently in use. These examples are not directive or prescriptive in nature and do not represent a rigid CAA view of best practices. SOPs may vary among fleets and among operators and may change over time. Operators can use this information to integrate these basic tenets into fleet-specific, route-specific, and equipment-specific operations and checklists. They are shown to denote how the SOPs and best practices can be integrated into the context of specific flight operations.

**APPENDIX 1**

## Runway Incursion Prevention Introduction

### The Philosophy of Using Standard Operating Procedures (SOP) for Runway Incursion Prevention

SOPs provide a structure that helps to decrease the probability of human error and capture errors before they result in a runway incursion. By applying SOPs to surface operations, pilots can reduce the probability of a runway incursion by increasing and maintaining situational awareness. Situational awareness is a continuous process of attentiveness and surveillance.

Situational awareness includes knowing:

- The location of the aircraft
- Weather
- Traffic
- The clearance from Air Traffic Control (ATC)
- All other factors that affect the safety of the flight

The SOPs contained in this ASN are designed to help pilots use all available resources to detect and correct errors – both their own, and those of their crewmembers, pilots of other aircraft, and air traffic controllers – before they result in a runway incursion. Implementation of these SOPs is a low-cost action with a potential for a high return in a reduction of incidents.

### Standard Operating Procedures

1 Captains will give a pre-taxi/departure briefing that includes the expected taxi route and restrictions.

2 Both pilots will monitor the frequency when initial taxi clearance is called for to ensure that both pilots hear the taxi clearance.

3 After taxi clearance has been received, the crew will agree on the runway assigned, any restrictions, and the taxi route. If not in agreement, the flight-crew will seek clarification from ATC.

4 Flight crews will observe “sterile cockpit,” especially while taxiing.

5 Both pilots should have the aerodrome chart out, available, and in use. Crosscheck the heading situation indicator (HSI), aerodrome chart, and aerodrome signage to confirm aircraft position while taxiing.

6 Fixed navigation lights (red, green, and white) must be on whenever the airplane is in motion.

7 Both pilots will monitor the appropriate tower frequency when anticipating a clearance to cross or taxi onto an active runway.

8 When approaching an entrance to an active runway, both pilots will ensure compliance with hold short or crossing clearance by discontinuing non-monitoring tasks (e.g., Flight Management System (FMS) programming, Airborne Communications Addressing and Reporting System (ACARS), company radio calls, etc.).

9 Prior to crossing or taxiing onto any runway, verbally confirm ATC clearance with other crewmember(s) and visually scan the runway and approach area.

10 Read back all clearances/instructions to enter a specific runway, hold short of a runway, and taxi into "position and hold," including the runway designator.

**NOTE: Do not merely acknowledge the foregoing instructions/clearances by using your call sign and saying "Roger" or "Wilco." Instead, read back the entire instruction/clearance including the runway designator.**

11 When entering a runway after being cleared for takeoff, or when "Line up and Wait" make your aircraft more conspicuous to aircraft on final behind you and to ATC by turning on lights (except landing lights) that highlight your aircraft's silhouette.

12 Be especially vigilant when instructed to "Line up and Wait" particularly at night or during periods of reduced visibility. Scan the full length of the runway and scan for aircraft on final approach when taxiing onto a runway either at the end of the runway or at an intersection. Contact ATC anytime you have a concern about a potential conflict.

a. In instances where you have been instructed to taxi to "Line up and Wait" and have been advised of a reason/condition (wake turbulence, traffic on an intersecting runway, etc.) or the reason/condition is clearly visible (another aircraft that has landed on or is taking off on the same runway), and the reason/condition is satisfied, you should expect an imminent takeoff clearance, unless advised of a delay.

b. If landing traffic is a factor, the tower is required to inform you of the closest traffic that is cleared to land, touch-and-go, stop-and-go, or unrestricted low approach on the same runway when clearing you to "Line up and Wait". Take care to note the position of that traffic and be especially aware of the elapsed time from the "Line up and Wait" clearance while waiting for the takeoff clearance.

c. ATC should advise you of any delay in receiving your takeoff clearance (e.g., "expect delay for wake turbulence") while holding in position. If a takeoff clearance is not received within a reasonable time after clearance to "Line up and Wait" contact ATC.

i. To signal intent to aircraft downfield **turn on landing lights when cleared for takeoff.**
ii. As part of the approach briefing, review the aerodrome chart and anticipated taxi route.

**CAUTION A potential pitfall of pre-taxi and pre-landing planning is setting expectations and then receiving different instructions from ATC. Flight crews need to follow the clearance or instructions that are actually received, and not the ones the flight crew expected to receive.**

**Best Practices and Techniques**

1 State your position whenever making initial contact with any tower or ground controller, regardless of whether you have previously stated your position to a different controller.

2 Write down non-standard or complex taxi instructions.

3 To signal intent to other pilots, consider turning on the taxi light when the aircraft is moving or intending to move on the ground, and turning it off when stopped, yielding, or as a consideration to other pilots or ground personnel.

4 At night, use edge lights to distinguish between taxiways (blue) and runways (white).

5 Flight crews should minimize “heads-down” activities, such as entering data into the FMS, while the aircraft is moving. Advise the pilot taxiing whenever heads-down activity is required.

6 When visually scanning the runway and approach area, flight crewmembers should verbally confirm scan results with each other (e.g., “clear right,” “clear left”).

7 When holding in position for takeoff, actively monitor the assigned tower frequency or the Common Traffic Advisory Frequency (CTAF) for potential conflicts involving your runway.

8 If unsure of position and on a runway, immediately clear the runway and notify ATC. Always notify ATC if you are unsure of your position; consider requesting “progressive taxi.”

9 When taxi visibility is low, crews should perform heads down tasks (e.g., programming the FMS, calculating takeoff data) while the aircraft is stopped or while taxiing straight ahead on a taxiway without complex intersections.

10 To confirm proper runway or taxiway selection, verify that the compass heading approximately matches the runway heading and taxiway orientation.

11 Some cockpit displays of traffic information [such as some implementations of Airborne Collision Avoidance System (ACAS) / Traffic Alert and Collision Avoidance System (TCAS)] have the capability and sufficient resolution to enable the display of traffic behind you. When "Line up and Wait", consider displaying traffic landing behind you to increase your awareness of the traffic situation.

12 When "Line up and Wait" at night, consider lining up slightly to the left or right of centerline (approximately 3 feet) to better enable a landing aircraft to visually differentiate the holding aircraft from runway lights.

13 When on final approach, actively monitor the assigned tower frequency (or CTAF) for potential conflicts involving your runway.

14 If you receive last minute turn off instructions from the tower ensure that you clearly understand the instructions and are certain that you can comply with them. If the air traffic control instruction is not satisfactory, as pilot-in-command you may request and, if practicable, will be issued an amended instruction.

**NOTE: Last minute turn off instructions should be avoided by ATC.**

**APPENDIX 2**

**Standard Operating Procedures (SOP) Template for Ground Operations and the Prevention of Runway Incursions**

A manual or section of a manual that serves as the flight-crew's guide to SOPs may double as a training guide. The contents should be clear and comprehensive. This template includes topics that industry and the Civil Aviation Administration (CAA) have selected as useful for developing effective SOPs for operations on the ground and on approach with an emphasis in the prevention of runway incursions. It does not include every topic that might apply, such as those that apply to special operating authority or new technology such as Extended Range Operations with Two-Engine Airplanes (ETOPS), Precision Runway Monitor (PRM), Surface Movement Guidance System (SMGS), and required navigation performance (RNP)).

Captain's authority

Use of automation

- The operator's automation philosophy
- Specific guidance in selection of appropriate levels of automation
- Autopilot/flight director mode control inputs
- Monitoring of automated systems and Flight Mode Annunciator (FMA)
- Flight Management System (FMS) inputs

Checklist philosophy

- Policies and procedures (who calls for, who reads, who does)
- Format and terminology
- Type of checklist Challenge-Do-Verify Do-Verify
- Walk-around

Checklists

- Safety check – power on
- Originating/receiving
- Before start
- After start
- Before takeoff
- Preliminary landing
- Landing
- After landing
- Parking and securing
- Emergency procedures
- Non-normal/abnormal procedures
- Who handles radios
- Primary language used
- Air Traffic Control (ATC)
- On the flightdeck
- Keeping both pilots in the loop
- Company radio procedures
- Flightdeck to cabin signals
- Passenger briefing
- Cabin to flightdeck signals
- Procedure to review/crosscheck clearances Cross or hold short of a runway Line up and wait Takeoff Land

Communications Briefings

- Controlled Flight In to Terrain (CFIT) risk consideration
- Special airport qualifications
- Special security considerations
- Temperature considerations
- Before taxi
- Before takeoff
- Descent/approach/missed approach (approach briefing generally done prior to beginning of descent)

Flightdeck access

- Onground/in-flight
- Jumpseat
- Access signals, keys

Flightdeck discipline

- Sterile cockpit – in-flight and on the ground
- Monitoring/crosschecking
- Maintaining outside vigilance
- Transfer of control
- Additional duties
- Flight kits
- Special security equipment
- Headsets/speakers
- Boom mikes/handsets
- Maps/approach charts
- Meals

Boarding passengers/cargo

- Special security considerations
- Carry-on baggage
- Exit row seating
- Hazardous materials
- Prisoners/escorted persons
- Guns onboard
- Count/load

Pushback/powerback

- Taxiing
- Single engine
- All engines
- Contaminated Runways
    - Ice
    - Snow ○ Water
    - Slush
- Prevention of runway incursions
    - Use of aerodrome chart
    - Crew confirmation of taxi clearance
    - Visually clear final approach path and the runway before crossing or taking any active

runway
    - Complex intersections, airfield construction, and “hot spots”

Crew Resource Management (CRM)
- Crew briefings
    - Flight attendants
    - Flight crew

Weight and balance/cargo loading
- Who is responsible for loading cargo, and securing cargo
- Who prepares the weight and balance data form; who checks it
    - Copy to crew

Flightdeck/cabin crew coordination
- Boarding
- Ready to taxi
- Cabin emergency
- Prior to takeoff/landing

Approach philosophy
- Monitoring during approach
- Precision approaches preferred
- Stabilized approaches standard
- Use of navigation aids
- FMS/autopilot
- Use, and when to discontinue use
- Approach fixes
- Limits for stabilized approaches
- Use of radio altimeter
- Briefing for expected runway prior to beginning approach
- Go-arounds:
    - Plan to go around
    - Change plan to land when visual, if stabilized

Individual approach type
- All types, including engine-out

For each approach
- Profile
- Flap/gear extension
- Callouts
- Procedures

Go-around/missed approach
- When stabilized approach fixes are missed
- Procedure
- Callouts
- Clean-up profile

Landing
- Actions and callouts
- Configuration for conditions

  - Visual approach
  - Low visibility
  - Contaminated runway
- Close-in turns
- Crosswind
- Rejected
- Transfer of control after first officer landing
- Anticipated landing runway and taxiway exit designation & direction of turn to the first hold short point

**APPENDIX 3**

**Pre-Departure Briefing**

There is a strong correlation between crews who use effective briefings and those who perform with fewer errors. The purpose of a pre-departure briefing is to make sure that all flight crewmembers are mentally "on the same page" and to highlight items that may be unique about the planned operation. Pay special attention to those items that are different or are potential problem areas, such as low visibility, runway incursion "hot spots," and short taxi distance. If it is anticipated that active runways will be crossed, attention should be devoted to discussing that as well. The following list contains several items that should be covered during a pre-departure briefing.

NOTE: Those areas that are generic to pre-departure briefings are shaded and those topics that are specific to aerodrome surface operations are unshaded. The reason that the aerodrome operations information is shown integrated with a generic aircraft is to show aerodrome operations-specific information in the context of a normal flight operation.

- Fuel
- Air Traffic Control (ATC) Clearance
- Expected Taxi Route
- Standard Instrument Departure (SID) or Instrument Flight Rules (IFR) Departure Procedure
- Any Applicable Special Considerations, such as:
  - Unique aerodrome advisory information
  - Unique noise abatement procedures
  - Unique engine failure procedures
  - Significant terrain or obstacles in the terminal area relative to departure routing
  - Significant weather considerations
  - Any other known risks and intentions

**Fuel**

Discuss the fuel onboard and ensure it is adequate for the flight including delays, alternates, weather en route, etc.

**ATC Clearance**

Discuss the ATC clearance and make sure that it matches the Flight Release and what is loaded into the Flight Management System (FMS).

**Expected Taxi Route**

Discuss where you are (gate location) and which runway you anticipate for departure. Then discuss how you plan to get from the gate to the runway. At a minimum, brief any planned crossings of active runways, complex taxi intersections, known or anticipated runway incursion "hot spots," aerodrome construction that may affect taxi or takeoff, and anything out of the norm.

**CAUTION A potential pitfall of pre-taxi and pre-landing planning is setting expectations and then receiving different instructions from ATC. Flight-crew need to follow the clearance or instructions that are actually received, and not the ones the flight-crew expected to receive.**

**SID or IFR Departure Procedure**

Brief the normal takeoff, in terms of anticipated flap and thrust settings. Brief departure clearance, and verify Mode Control Panel and FMS are properly set up for normal departure.

**Any Applicable Special Considerations**

Focus on those things that are non-normal for this takeoff, or any special procedures. These may include elements such as unique aerodrome advisory information, unique noise abatement procedures, unique engine failure procedures, significant terrain or obstacles in the terminal area relative to departure routing, significant weather considerations, and any other known risks and intentions.

**CAUTION After taxi clearance has been received, the crew will agree on the runway assigned, any restrictions, and the taxi route. If not in agreement, seek clarification from ATC.**

**Example Pre-Departure Briefing:**

Accomplish the pre-departure briefing once you receive the ATC clearance and your aircraft is fueled (fuel slip onboard if applicable). Ideally, the briefing should be conducted about ten minutes prior to gate departure. When discussing the taxi portion, both pilots should reference the aerodrome chart. Below is an example of how these items can be briefed:

- *The required fuel for the flight is onboard. We don't need a takeoff alternate but because ABC (Departure Aerodrome) has a forecast of 800 broken and 2 miles visibility we have a destination alternate of XYZ. The weather in XYZ is 2,000 broken and 5 miles.*

- *Our ATC clearance has been crosschecked with the Flight Release and what is in the FMS.*

- *We are at Gate B28 and we are planning a departure on Runway 28L at the Papa intersection. To get to that runway, we can expect to first hold short of Runway 28C, probably on taxiway Victor. With the light rain and 7 degree temperature, we will plan engine anti-ice on for taxi and takeoff.*

- *Let's plan Flaps 1 and Flex thrust. Our clearance is via the Oscar Five Departure, which says "climb runway heading to 1,700 ft. before turning on course. Maintain 5,000." I see that runway heading is set on the mode control panel and so is 5,000 ft. Let's beware that the SID requires a climb gradient of 1,133 fpm to 1,700 msl if the weather falls below 300-1. Our first fix is ZULU intersections, and that is in the FMS.*

- *As far as special conditions are concerned, there are no unique procedures for this aerodrome.. However, if we lose an engine, the engine-out procedure says 'turn to heading of 200 degrees using 15 degree of bank, and climb to 3,000.' Also, instead of using a clean-up height of 1,000 ft, if we lose an engine we will clean-up at 1,200 ft agl, which is 2,400 msl. Is there anything that you would like to discuss further, or do you have any questions?*

**Aerodrome Surface Operations Procedures/Departure**

The following dialogue boxes illustrate aerodrome surface operations procedures integrated in to the to the context of a normal aerodrome departure.

**NOTE: Those areas that are related to specific aircraft operations are shaded and those that are specific to aerodrome surface operations are unshaded.**

| **Preflight** | |
|---|---|
| **Captain** | **First Officer (F/O)** |
| *60 minutes prior to departure obtain Flight Release and weather package.* | |
| *Report to aircraft at least 30 minutes (45 minutes for international operations) prior to scheduled departure time.(Timings will be based on air operator procedures)* | |
| Accomplish Crew Briefing when originating trip | Participate in Crew Briefing • |
| •• If electrical power is not already on, read and do "Safety & Power On Checklist." | |
| • Accomplish Captain's Preflight | •Accomplish First Officer's Exterior Preflight or Exterior Intermediate Preflight •Record current ATIS information •Accomplish First Officer's Preflight |
| **Before Start** | |
| **Captain** | **F/O** |
| *At least 20 minutes prior to departure when fueling is complete:* | |
| • Check fuel slip for accuracy. Verify actual fuel load is within limits of GATE REL fuel and balanced. | •Check ACARS GMT for correct time. Insert flight number, departure and destination airport identifiers, flight plan time, and payroll numbers. •Verify actual fuel load is within limits of GATE REL fuel and balanced. Enter actual FOB into ACARS. |
| •• Obtain ATC clearance. If done verbally, both pilots should listen to clearance. | |
| • Verify the proper altitude and transponder code is set | • Set the proper altitude in altitude alerter |
| • Accomplish "Captain's Before StartFlow (to the line)" | • Accomplish "First Officer's Before Start Flow (to the line)" |
| • Review Flight Release, Weather Package, and all pertinent Jeppesen pages<br>• Set communication frequencies and navigation frequencies and courses for departure<br>• MCP set for departure<br>• Verify ATC clearance matches FMC and Flight Release route<br>• Both pilots must be thoroughly familiar with aerodrome orientation and taxi route<br>• Have aerodrome chart out and in view<br>• PF accomplish Departure Review:<br>– Fuel<br>– ATC Clearance<br>– Expected taxi route<br>– SID or IFR Departure Procedure<br>– Any applicable special considerations, such as:<br>• Unique aerodrome advisory information<br>• Unique noise abatement procedures<br>• Unique engine failure procedures<br>• Significant terrain or obstacles in the terminal area relative to departure routing<br>• Significant weather considerations<br>• Any other known risks and intentions | |
| "Before Start Checklist" | • Accomplish Before Start Checklist to the line |
| *Initiated by Captain approximately 10 minutes prior to departure:* | |

| | |
|---|---|
| Accomplish Welcome Aboard announcement | |
| *Just prior to pushback – or engine start at gate – after agent provides count and verifies fuel onboard and GSI status:* | |
| • Ensure Cabin Ready Notification is received from Cabin Crew and relay short taxi, overwater beyond 50 nm, or other pertinent information | |
| | Obtain pushback clearance, if required. Anti-Collision lights ON. LOGO lights (if installed) ON for night operations. Door Lights & Lock Check. |
| **Pushback** | |
| **Captain** | **F/O** |
| •• Accomplish pushback procedures if required | |
| **Engine Start** | |
| **Captain** | **F/O** |
| Normal starting procedure is to start Engine 2, then Engine 1 using APU air and electrical supply. | |
| *When cleared to start engines:* | |
| **"Below the line"** | •L & R Packs & Press – OFF/Checked •Accomplish Before Start Checklist below the line |
| Accomplish engine start. | |
| **After Start** | |
| **Captain** | **F/O** |
| • Give thumbs up signal when ground crew is no longer required | |
| *When ground equipment is clear and "thumbs up" has been received from the ground crew:* | |
| • *Accomplish After Start Flow* | • Accomplish After Start Flow |
| "After Start Checklist" | •Accomplish After Start Checklist |
| **Taxi** | |
| **Captain** | **F/O** |
| • Monitor Taxi Clearance and restate any hold short instructions Turn taxi light on when aircraft is moving | •Once Captain is able to monitor ATC communications, request Taxi Clearance •Write down non-standard or complex taxi instructions •Request confirmation if Captain does not restate any hold short instructions •Maintain vigilance outside the aircraft Inform captain if out of the loop for any reason |
| •• Crosscheck HSI, aerodrome chart, and aerodrome signage to confirm aircraft position while taxiing.<br>•• Approaching the entrance to an active runway, ensure compliance with hold short or crossing clearance before continuing with non-monitoring tasks. Visually scan runway and approach areas. | |
| *When clear of congested area and TOW and W & B message received:* | |
| •• Discuss TOW and W&B message. | |
| | Enter FMC data (inform captain that you will be out of the loop) |
| **Before Takeoff** | |
| **Captain** | **F/O** |
| *After a runway assignment has been issued and takeoff data has been received:* | |

| | |
|---|---|
| • Accomplish Before Takeoff Flow to the line | • Accomplish Before Takeoff Flow to the line |
| PF accomplish Takeoff Briefing: -Initial heading -Initial altitude -Initial fix or route segment - Summarize applicable special considerations previously briefed and any new considerations | |
| ***"Before Takeoff Checklist"*** | • Accomplish Before Takeoff Checklist to the line |
| *1-3 minutes prior to takeoff:* | |
| | • Cabin Crew – Notify |
| *Cleared onto the active runway:* | |
| Verbally confirm ATC clearance onto active runway with other crewmembers and confirm proper runway selection using aerodrome signs and markings and the aerodrome chart. Visually scan runway and approach areas. Check that FOB is at or above T.O. Min. Fuel Quantity. | |
| Turn on wing, logo, and runway turn-off and taxi lights ***"Below the line"*** | •Transponder – TA/RA •Start Switches – CONT<br>•Complete Before Takeoff Checklist |
| *When the aircraft is at the takeoff end of the runway:* | |
| •• Confirm proper runway selection using HSI. | |
| If F/O is PF, transfer aircraft controls | •Ensure correct departure runway is displayed<br>•Select/press EXEC |
| *When cleared for takeoff:* | |
| • Turn on all remaining exterior lights | |

**APPENDIX 5**

**Arrival Briefing**

As in the case of the pre-departure briefing, an effective arrival briefing can increase crew performance by highlighting those potential areas that need special attention and consideration. The arrival briefing should ideally be conducted during low workload periods prior to beginning descent. This is supported by data, which indicate that crews who conducted the arrival briefing after beginning descent committed 1.6 times more errors during descent/approach and landing, compared to those crews who briefed prior to top of descent. When the briefing is conducted during lower workload periods (such as cruise flight), greater attention can be provided to the content of the briefing.

To increase awareness of anticipated operations on the aerodrome, attention should be devoted to discussing items that are different, or potential problem areas, such as low visibility, runway incursion "hot spots," aerodrome construction and short taxi distance. If it is anticipated that active runways will be crossed, attention should be devoted to discussing that, as well.

**CAUTION A potential pitfall of pre-taxi and pre-landing planning is setting expectations and then receiving different instructions from Air Traffic Control (ATC). Flight crews need to follow the clearance or instructions that are actually received, and not the ones the flight crew expected to receive.**

During the arrival briefing, pilots should refer to each of the charts that are applicable to the planned operation. For example, if a Standard Terminal Arrival (STAR) will be flown, refer to that chart, and crosscheck the applicable information. Likewise, refer to the applicable approach chart, as well as the aerodrome chart.

**NOTE: The following list contains items that should be covered during an arrival briefing. Those areas that are generic to an arrival briefing are shaded, and those topics that are specific to airport surface operations are unshaded.**

- *Arrival chart: Use STAR chart, if applicable, to confirm/verify the lateral routing and vertical profile, such as waypoint altitude and speed crossing restrictions if not already accomplished. Crosscheck that these values are properly set into the Flight Management System (FMS), if applicable.*
- *Discuss weather at destination and surrounding areas, if weather is a factor.*

- *Approach chart: Accomplish a complete approach briefing except when not required in day Visual Meteorological Conditions (VMC). At a minimum in day VMC, discuss any special considerations and discuss and use the most precise navigation and visual approach aids available. A complete approach briefing is accomplished as follows using the approach chart and other relevant radios/instruments:*
  - *Approach name and runway*
  - *Approach chart date*
  - *Primary navaid frequency*
  - *Final approach course*
  - *Crossing altitude at Final Approach Fix (FAF)*
  - *Decision Altitude (height) (DA (H)), Alert Height (AH), or Minimum Descent Altitude/Missed Approach Point (MDA/MAP)*
  - *Touchdown Zone Elevation (TDZE)*
  - *Highest Minimum Safe Altitude (MSA)*
  - *Missed approach*
  - *Required visibility*
  - *Any applicable special considerations, such as:*

*Compliance with stabilized approach conditions*

- *Unique aerodrome advisory approach information*
- *Unique noise abatement procedures*
- *Unique engine failure during missed approach procedure*
- *Significant terrain or obstacles in the terminal area relative to approach routing*
- *Significant weather considerations*
- *Any other known risks and intentions*

- Aerodrome chart: Refer to the aerodrome chart and discuss approach lighting, usable runway length, anticipated direction of turn off and aerodrome operations. While referring to runway length, this may be a logical time to discuss planned landing flap setting and auto brake usage. If planning to land on a runway that will require crossing another runway during taxi to the terminal, make note of that. It may also be helpful to denote the planned runway exit point.

- *Anything else that may be applicable to increase safety of the operations.*

**CAUTION A potential pitfall of pre-taxi and pre-landing planning is setting expectations and then receiving different instructions from ATC. Flight-crew need to follow the clearance or instructions that are actually received, and not the ones the flight crew expected to receive. Example Arrival Briefing:**

Accomplish the Arrival Briefing once the Arrival ATIS is received. Ideally, the briefing should be planned so that it is conducted prior to beginning descent. Reference each relevant chart as that information is being discussed. Below is an example of how these items can briefed:

- *We are planning the CHARLIE FOUR arrival into ABC. The lateral routing has been checked and verified. As far as crossing restrictions, we will expect DELTA at 15,000 feet, and ECHO at 250 kts and 10,000 feet. Both of those are in the FMS. The STAR also says for landings to the East, at GOLF intersection, turn left to a heading of 270 degrees. It looks like we will have to make that turn manually through the Heading mode, as it is not programmed into the FMS.*

- The weather is 400 overcast, 1 mile visibility with light rain and mist. There are reports of moderate icing in the area, so let's plan engine anti-ice on. Be on the lookout for any structural icing, and if necessary, we will use wing anti-icing.

- This will be an ILS to Runway 9R at ABC. Chart date is 19 January, 05. Highest MSA is 2,600. Touchdown zone elevation is 22 feet. Localizer frequency is 109.3; inbound course is 087 degrees. We should cross MIKE at 1,725' and DA is 222'. The missed approach procedure is climb to 1,500', then a climbing right turn to 2,000', direct OSCAR VOR and hold. If we hold at OSCAR, it will be a teardrop entry, and once established in the holding pattern, left hand turns. The missed approach has been verified in the FMS. Required visibility is 1,800 RVR, and we have that right now.

- *Runway 9R is 10,400 feet long, and it has 9,300 feet beyond the glideslope. There is an ALSF-II approach lighting system, but no VASI or PAPI. Let's plan Flaps Full, with no auto brake. We will make a left turn off the runway around the S4 intersection. One thing I want to point out is*

  *that our taxi route to the terminal will intersect Runway 9L, so back me up and make sure we don't cross until we have clearance to do so. I see there are runway incursion "hot spots" at intersections JULIET and NOVEMBER.*

- *As far as special conditions, there are no unique procedures for this aerodrome. Other than the possibility of some icing, there are no special items that require special attention for this approach. Is there anything that you would like to discuss further, or do you have any questions?*

**Aerodrome Surface Operations Procedures/Arrival**

The following dialogue boxes illustrate airport surface operations procedures integrated into the context of a normal airport arrival.

**NOTE: Those areas that are related to specific aircraft operations are shaded and those that are specific to aerodrome surface operations are unshaded.**

| **Landing** | |
|---|---|
| **PF** | **Pilot Monitoring (PM)** |
| *At Main gear touchdown:* | |
| • Deploy Thrust Reverse | •Verify spoiler extension and REV green on ECAM ***"SPOILERS, TWO REVERSE."*** |
| *After Nose wheel touchdown:* | |
| •Apply brakes, if required •Monitor landing roll | • Monitor deceleration |
| *At 80 knots:* | |
| • Select idle reverse | ***"80 knots"*** |
| *At 60 knots:* | |
| Verify idle reverse thrust or less | ***"60 knots"*** |
| *If First Officer (F/O) accomplished landing, when captain is ready to take control of aircraft:* | |
| ***"I have the aircraft."*** •Captain assumes control of the aircraft | ***"You have the aircraft."*** FO relinquishes control of aircraft |
| **Taxi** | |
| **Captain** | **F/O** |
| *When clear of active runway:* | |
| • Monitor Taxi Clearance and restate any hold short instructions | •Request taxi clearance •Write down non-standard or complex taxi instructions •Request confirmation if Captain does not restate any hold short instructions •Maintain vigilance outside the aircraft •Inform captain if out of the loop for any reason |
| Crosscheck HSI, aerodrome chart, and aerodrome signs to confirm aircraft position while taxiing. When approaching the entrance to an active runway, ensure compliance with hold short or crossing clearance before continuing with non-monitoring tasks. Visually scan runway and approach areas. | |
| *When clear of landing runway and compliance with any runway hold short clearances can be assured.* | |
| •Accomplish After Landing Flow •Turn taxi light on when aircraft is moving | • Acomplish After Landing Flow |
| ***"After Landing Checklist"*** | •Accomplish After Landing Checklist •If necessary, notify company operations of your arrival and confirm gate assignment and availability (inform captain that you will be out of the loop |

**APPENDIX 7**

**Prior to Arrival Considerations**

**Considerations Prior to Descent**

**NOTE: The following list contains items that should be covered during an arrival briefing. Those areas that are generic to an arrival briefing are shaded and those topics that are specific to aerodrome surface operations are unshaded.**

To optimize situational awareness, the Captain should ensure that significant terrain and obstacles affecting arrival or approach are identified. Review charted MSA, Grid MORA, MEA, contour or spot elevation and EGPWS indicated on the flight plan (highest actual terrain height 5 nm left and right of course between route waypoints on the planned route).

All crewmembers should review field conditions and special procedures for the arrival aerodrome, including Ops Advisory pages.

**Approach Briefing**

**Post Landing**

Captains should brief the crew on the anticipated taxi to the gate from the primary/secondary landing runway and consider the following:

- The anticipated primary/secondary landing runway
- NOTAMs that reference the anticipated taxi route and runways
- Aerodrome construction of taxiways and runways
- "Hotspots" depicted on the airport diagram or listed in NOTAMs
- Potential runway incursion areas such as unusual placement of hold short lines
- Use of ILS hold short lines when noted on ATIS
- Standard taxi routes

**Visual Approaches**

The Captain will ensure that aerodrome elevation and landing runway are identified. In addition, brief intentions in the event of a go-around and anticipated post landing taxi routes.

In the event of a runway change in visual conditions, no further briefing is required, but the Captain should consider runway conditions, aircraft weight, and post landing taxi routes, if applicable.

**Instrument Approach as Backup In Night VMC or Whenever IMC May Be Encountered During Approach**

Flight crews should prepare for an instrument approach as a backup when a visual approach is planned in night VMC, or whenever IMC might be encountered during the approach.

Preparation should include selecting, and having open and readily available for use, the chart for the best available instrument approach. A precision approach, if available, would be the best selection; any approved approach providing precision-like vertical guidance would be the next best selection; any other instrument approach would be the third choice.

The briefing should include at least the following, as applicable:

Frequency of the approach navaid
Final approach course
Glide slope intercept altitude, or FAF/OM crossing altitude
Applicable MDA, DA, or DH
Missed approach point and procedure
Post landing briefing

Preparation should also include applicable instrument approach preparation procedures.

**Instrument Approaches**

Each crewmember will review the current Jeppesen approach chart, after ensuring all pilots have the same page. The Captain will ensure the items on the Jeppesen Briefing Strip, applicable minima, and IAF crossing altitudes (if applicable) are briefed.

For approaches without a charted briefing strip, the following items are the minimum to be briefed:
Applicable minima (visibility, RVR, ceiling)
Approach navaids and Idents
MSA/Field Elevation
IAF crossing altitude (if applicable)
Fined approach course
FAF/OM crossing altitude
Applicable MDA, DA, DH, or AH
Missed approach procedure
Post landing taxi routes

**Instrument Approach Procedures**
Tune and identity approach facility
Set MDA, DH, AH as applicable
Use all approach and landing aids available
Set up EFIS and Flight Mode panels
Check FMC/Map depicted approach and missed approach vs. Jeppesen chart
Verify, the Altitude Window is set to the missed approach altitude:

- Visual approach – when executing a go-around
- Non-Precision Approach - after intercepting a normal visual glide path or upon initiating a go-around at MDA
- ILS approach – after glide slope capture