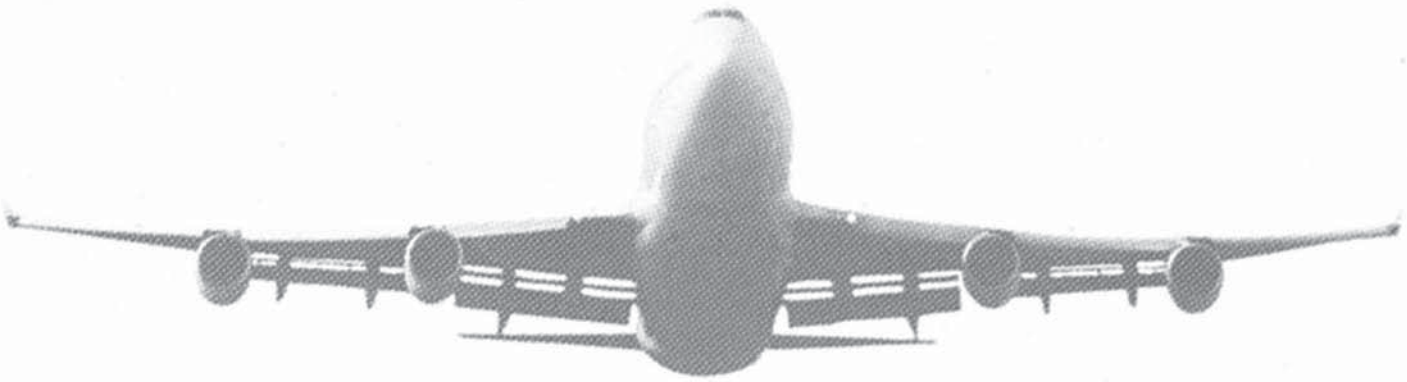
Flightpath

AVIATION ENGLISH FOR PILOTS AND ATCOs



STUDENT'S BOOK

Philip Shawcross

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Author Introduction

In aviation, language is inseparable from safety. Contributing to the enhancement of safety is the ultimate objective of *Flightpath*. So, this course is less about learning English than about learning how to perform communicative tasks in English effectively in non-routine and unexpected operational situations.

Flightpath is intended to assist pilots and Air Traffic Controller Officers in reaching and maintaining a robust ICAO Operational Level 4, keeping in mind that language proficiency is soon eroded over time and considerably reduced in stressful situations. It has been written not only for initial training, but also with a view to recurrent training, proficiency enhancement and life-long learning, which I believe is the only realistic and responsible perspective from which this safety-critical language proficiency should be viewed.

The *Flightpath* Student's Book, with its audio and video material is part of a comprehensive suite of materials. It is supported by a website at **www.cambridge.org/elt/flightpath/** which contains an extensive aviation glossary and additional articles, case studies and classroom resources. The accompanying Teacher's Book is designed for teachers at all levels of experience. Equal attention has been given in the book's activities to the needs of pilots, Air Traffic Control Officers, and mixed classes.

ICAO Standard Phraseology is the cornerstone of radiotelephony. Standard phraseology, then, is widely used in *Flightpath* for reasons of contextual authenticity and to allow students to practise the transition between phraseology and plain language. However, the object of this book is *not* phraseology, but plain language in an operational context.

I am extremely grateful to Airbus, Air New Zealand, Eurocontrol, the Flight Safety Foundation, ICAO, Jeppesen and NATS for their kind permission to use their publications, internet and video media, which make up such a significant part of the content of this book. They have enabled a book to be produced which I trust is not only consistently relevant for the language skills required by professional flight crews and controllers, but whose content is of intrinsic value to them.

I am deeply indebted to Elizabeth Mathews, all the other members of the ICAO PRICESG (Proficiency Requirements in Common English Study Group) and to the Air Navigation Bureau as a whole for their seminal work in developing an international framework of English language proficiency for pilots and controllers which will make the skies a safer place.

I would also like to thank all those distinguished subject-matter experts whose remarks and suggestions have contributed so much to making this a better book. Moreover, my sincere thanks go out to Caroline Thiriau and Keith Sands, at Cambridge University Press and freelance editors Will Capel and Ben Gardiner whose friendly advice, expertise and support have been invaluable.

Finally, I dedicate *Flightpath* to my wife, Jackie, who made it all possible.

Philip Shawcross

Contents

Panel of expert reviewers

The author and publishers would particularly like to thank the following aviation and language professionals who reviewed draft and final material for *Flightpath* to ensure that it reflects both industry best practice and ICAO Level 4.

Brian Day served as a Technical Officer in the Secretariat of the International Civil Aviation Organisation (ICAO) until January 2007. As the Secretary of the PRICE Study Group that formulated the proposed provisions for aviation English proficiency for air traffic controllers and pilots, Brian was responsible for ensuring their operational sufficiency, linguistic legitimacy, ease of regulation and general acceptability to the international aviation community.

Jeremy Mell occupies the post of Deputy Counsellor for Sustainable Development and Transportation at the Embassy of France in Washington, DC. His previous posts had been in aviation English and human factors training in France (ENAC, Toulouse) as well as in training, management and international consultancy. Jeremy was a PRICESG member, has participated in aviation working groups focusing on communications at ICAO and Eurocontrol, and has a doctorate in language sciences applied to aeronautical telecommunications (University of Toulouse).

Adrian Enright has a background in air traffic control and has been instrumental in developing language proficiency tests for air traffic control since 1988. A founder member of ICAO's PRICE Study Group, Adrian was involved in formulating the provisions that now define the ICAO language proficiency requirements for air traffic controllers and pilots. Adrian was the Project Leader for Eurocontrol's ELPAC test (English Language Proficiency for Aeronautical Communication).

Sergey Melnichenko is Deputy Director for Testing and International Co-operation at the CompLang Aviation Training Centre in Moscow, a member of the Board of ICAEA, and a member of the Flight Safety Foundation. He is author of several books on radio communications, editor-in-chief of the Russian edition of *AeroSafety World* and developer of the TELLCAP® Test of English Language Level for Controllers and Pilots. In the past, he has worked as a senior interpreter at the Moscow ATC Centre, as a radio operator for several Russian airlines, and was a consultant to the ICAO PRICE Study Group.

Martin Reade is an airline Captain with over 15 years' experience flying around Europe. He currently flies the Airbus A320 series for EasyJet. He is also a Modern Languages graduate of Aston University and has experience of Teaching English as a Foreign Language.

Michel Trémaud has over 40 years' experience in aviation, in flying, engineering, flight operations, flight safety and management roles. He has been involved for over 15 years in contributing to aviation English proficiency efforts, primarily for Airbus. He is the author of numerous flight operations guidelines, procedures and articles. He is author of the Flight Safety Foundation Approach and Landing Accident Reduction Briefing Notes.

Karsten Theil was ICAO Regional Director, Europe and North Atlantic from 2004 until 2010. He was originally trained and licensed as an air traffic controller, and his area of expertise is air navigation. He served as the Representative of Denmark on the Council of ICAO from 1995 to 1998. At ICAO's Eleventh Air Navigation Conference in 2003 he was elected Chairman of Committee A. He served as Chairman of the North Atlantic Systems Planning Group (NAT SPG) from 1991 to 1995 and was Chairman of the European Air Navigation Planning Group (EANPG) from 2000 until his appointment as ICAO Regional Director, in 2004. He retired in 2010.

UNIT 1
Language and communication in aviation

COMMUNICATION FUNCTIONS

- Standard phraseology and plain language
- Misunderstanding
- Readback
- Communication errors: omitted or incorrect call sign
- Types of transmission
- Requesting clarification and making requests
- Saying why unable

Lead in

> **When controllers and pilots better understand that language is an imperfect medium and is easily misinterpreted, they will be careful in their use of both standardised phraseology and plain language – and the airways will be safer because of it.**
>
> **Brian Day**

1a **What is the difference between standard phraseology and plain language?**

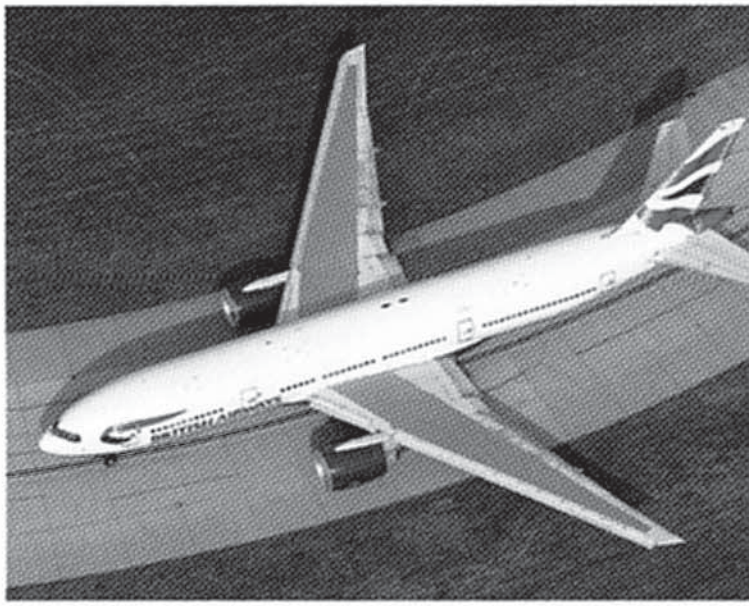
b **Describe situations from your operational experience in which you had to use plain language.**

c **Why do you think that Brian Day, an ex-controller, says that language is 'an imperfect medium'?**

Standard phraseology and plain language

2a 01.01 Listen to ten ATC (Air Traffic Control) and pilot transmissions. Are they in standard phraseology or plain language?

Pilot *Request taxi for departure to Montreal.*
Standard phraseology
ATCO *What is the condition of your injured passenger?*
Plain language



b 01.01 Listen again and decide which transmissions it is possible to respond to in standard phraseology. If it is not possible, explain why.

c 01.01 Listen again and respond appropriately to each transmission.

Pilot *Request taxi for departure to Montreal.*
A (ATCO) *Taxi to holding point Bravo 3 Runway 27 Right via Delta. Hold short of Runway 27 Right.*
ATCO *What is the condition of your injured passenger?*
A (Pilot) *He appears to be concussed and have severe bruising. The cabin crew are administering first aid, but he requires urgent medical attention.*

Misunderstanding

3a Look at the six different ways in which misunderstanding can occur. For each one, give an example.

- vocabulary confusion
- a readback error
- non-standard phraseology
- incorrect or imprecise English
- a garbled message
- incorrect pronunciation

b 01.02 Listen to six transmissions. Match the transmissions (1–6) to the reasons (a–f) why each one has been, or could be, misunderstood.

a vocabulary confusion
b a readback error *1*
c non-standard phraseology
d incorrect or imprecise use of grammar
e a garbled message
f incorrect pronunciation

c 01.02 Listen again and respond to each R/T exchange, removing the misunderstanding.

ATCO *Delta 357, descend to altitude 9,000 feet, QNH 1017.*
Pilot *Descend to altitude 5,000 feet, Delta 357.*
A (ATCO) *Delta 357, negative: descend to altitude niner thousand feet. I say again, altitude niner thousand feet.*

d In pairs, describe a situation from your operational experience in which language was an obstacle in communicating effectively. Explain why.

e How can cases of misunderstanding like these affect safety?

Language confusion

4a **In pairs, identify the word which is incorrect in the sentences below. Then propose a more appropriate word and explain the difference in meaning between the two words.**

1 The cabin crew have reported an unruly passenger in the after cabin. *Aft*
2 The smoke fumes being sucked into the air conditioning system could pose a threat to the passengers' security.
3 We have an elderly passenger who has suffered a stroke. Request information about the nearest alternative?
4 All strangers will have to fill in immigration cards.
5 We have three passengers suffering from severe concussion and bruises, and will request an ambulance when we reach the stand.
6 The Antonov 124 made a hardly landing and may have some damage to the gear and tyres.
7 Number 2 engine ingested some birds during climb-out. Engine performance seems OK, but we are controlling the indications.
8 I'm waiting for some vegetarian meat trays to be delivered by catering; then we'll be ready to depart.

ICAO FOCUS

"Sometimes I won't catch the numbers in a frequency change, the name of a fix or off-route waypoints because they might be pronounced differently."

quoted in *United States Airline Transport Pilot International Flight Language Experiences – Report 2: word meaning and pronunciation* (National Technical Information Service)

Which aspects of language have you found create the most obstacles to a complete understanding?

b **1.03 Listen to ten transmissions. Each transmission contains a word which is pronounced incorrectly. Cross out the word you hear, and circle the word which is intended.**

1 ~~quite~~ / (quiet)	2 loose / lose	3 services / surfaces	4 wheel / well	5 array / area
6 feet / feed	7 ridge / rich	8 ice / eyes	9 watching / washing	10 heat / hit

c **1.04 Listen to ten sentences and choose the correct ending for the words (1–10). Choose (–) if the word has no added ending.**

1 lift	s / ed / ing / –	6 clear	s / ed / ing / ly / –
2 disconnect	s / ed / ing / –	7 slow	s / ed / ing / ly / –
3 service	s / ed / ing / –	8 check	s / ed / ing / –
4 clear	s / ed / ing / –	9 disconnect	s / ed / ing / –
5 turn	s / ed / ing / –	10 reduce	s / ed / ing / –

d **1.04 Listen again and practise saying the sentences.**

Readback

5a 1.05 Listen to eight ATCO instructions, clearances and approvals. For each transmission, read back or respond appropriately. Pay attention to pronunciation, clarity and delivery.

ATCO *Descend to Flight Level 130.*
A (Pilot) *Descending to Flight Level 130.**

*NOTE: Some States have preferred to omit *to* in such clearances to avoid confusion with *two* and *too* but ICAO has not supported this decision.

b Pilots → p147 ATCOs → p157 Take turns to give instructions and information or make requests. Request clarification if necessary.

ATCO *Air France 475, report ready for pushback.*
Pilot *Ready for pushback, Air France 475.*

Pilot *Malaysian 261, request ILS approach Runway 31 Left.*
ATCO *Malaysian 261, cleared ILS approach Runway 31 Left.*

ICAO FOCUS

"Lack of a readback or an incorrect readback, not challenged by the air traffic controller, resulted in confusion events and runway incursions."

Michel Trémaud, *Erasing Confusion* in Flight Safety Foundation *AeroSafety World*, May 2010

- In what ways does good readback discipline reinforce aviation safety and avoid confusion?
- In your experience, do pilots and controllers always monitor readback?

Communication errors: Omitted or incorrect call sign

6 1.06 Listen to eight controller-pilot communications in which there is either no readback or an incorrect readback. For each communication, give a correct readback.

ATCO *Aeroflot 238, cleared to land Runway 26 Right, wind 220 degrees, six knots.*
A (Pilot) *Cleared Runway 26 Right, six knots, Aeroflot 238.*

ATCO *Gulfair 4752, turn left heading 290, intercept ILS 26 Left.*
Pilot *Turn left heading 250, intercept ILS 26 Left, Gulfair 4752.*
A (ATCO) *Gulfair 4752, negative. Turn left heading 290, I say again 290, intercept ILS 26 Left.*

ICAO FOCUS

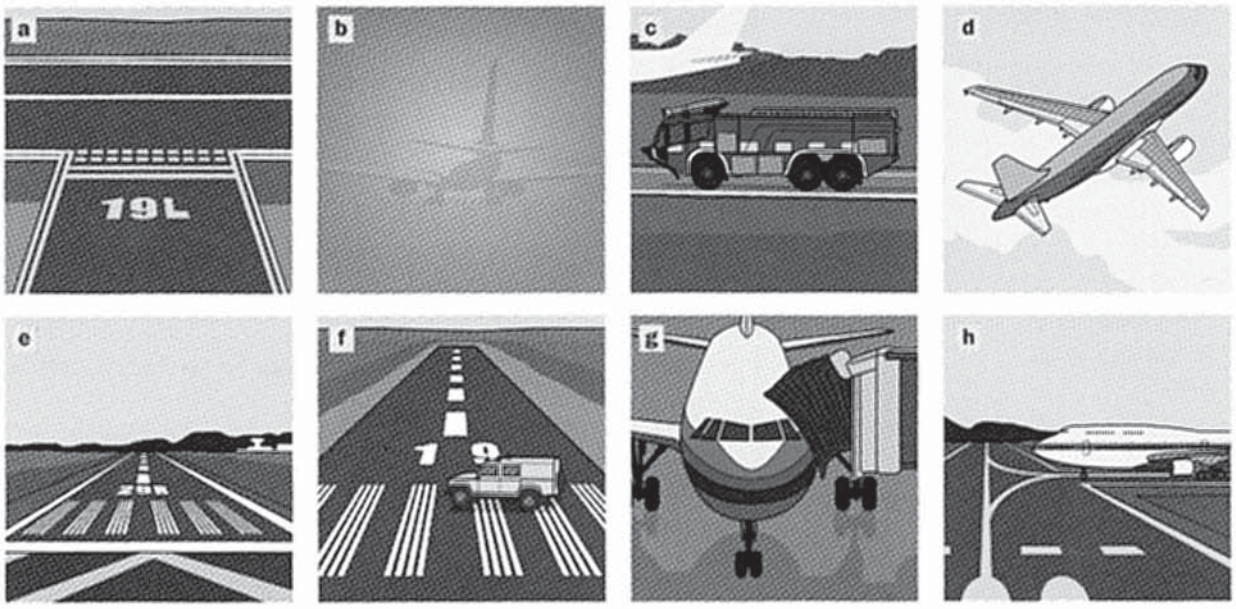
"Omitting the call sign or using an incorrect call sign jeopardises an effective readback/hearback."

Flight Safety Foundation ALAR Briefing Note 2.3: Pilot-Controller Communication

- What outcomes could an omitted or incorrect call sign have? Give examples.
- What is the difference between readback and hearback?

Communication situations

7a **O1.07** Listen to eight transmissions and match them to the pictures (a–h).



b **O1.07** Listen again and identify the type of transmission. Mark each transmission Instruction, Request or Information.

1 *Instruction*	5
2	6
3	7
4	8

c Look at the transmissions (1–6) below. Are they in standard phraseology or plain language?

1 Request departure information
2 Expect start-up time at 19:38 due traffic
3 Which is the latest ATIS information?
4 Maintain 3,000 feet until glide path interception
5 Taxiing to holding point Runway 17 Left
6 What sort of assistance do you require on arrival?

d **O1.08** Work in pairs. Listen to 12 transmissions and match them to the task types (a–f) below. Some of the transmissions are in standard phraseology, some in plain language.

a giving, amending and cancelling instructions *1*
b acknowledging and reading back
c asking for clarification or more precise information
d giving information
e requesting action/permission
f asking about needs, preferences, readiness, reasons and feasibility

8 In pairs, prepare transmissions between a controller and a pilot using the six task types in Exercise 7d. Then perform them for the class.

Requesting clarification and making requests

9a In pairs, clarify these ambiguous statements in plain English.

1 We're having trouble stabilising.
2 It's very bumpy up here.
3 We're showing a drop in hydraulic pressure.
4 We're having a smooth ride.
5 There's nothing in sight.
6 We've got three greens.
7 Give way to the triple seven.
8 Perform a 360.
9 I'll get back to you.
10 Is that clear?

b Compare your suggestions with the rest of the class.

10a **01.09** Listen to ten communications. Explain why each one could be misunderstood.

ICAO FOCUS

"Sometimes the phraseology "Say again" should be understood as a request for clarification rather than repetition."

ICAO Doc. 9835 Manual on the Implementation of ICAO Language Proficiency Requirements, 4.5.3c 2nd edition, 2010

- What is the difference between repetition and clarification?
- What else, apart from the words used, do you listen for in a transmission?

Pilot *We are still held up at our stand.*
ATCO *Say again.*
Pilot *We have a mechanical problem and are unable to push back for the moment.*

- Suggest plain English phrases you can use to clarify a statement.

LANGUAGE FOCUS: Asking questions

Do/Does	***Do*** *you have any indication of weather?*
	Does *the radar show any adverse weather?*
Are/Is	***Are*** *you ready?*
	Is *the cabin secure?*
Have/Has	***Have*** *you got any dangerous goods?*
	Has *Runway 24R been re-opened?*
Say	***Say*** *heading*
Confirm	***Confirm*** *position over MSA*
Report	***Report*** *airborne*
What?	***What*** *is the problem?* ***What*** *do you mean?*
What sort/type?	***What sort*** *of TCAS advisory did you have?*
Which?	***Which*** *runway is in use?*
Who?	***Who*** *issued the clearance?*
Whose?	***Whose*** *call sign is 'Speedbird'?*
Why?	***Why*** *did you discontinue the approach?* / Report reason for going around
When?	***When*** *do you expect to reach CAM?* / Report ETO CAM
How much?	***How much*** *fuel have you got?* / Report endurance
How many?	***How many*** *passengers are (there) on board?* / Report passengers on board
How far?	***How far*** *are you from the threshold?* / Report distance from threshold
How long?	***How long*** *do you require to turn around?* (time)
	How long *is the runway?* (distance) / Advise runway length
How often?	***How often*** *have you had that advisory?*

NOTE: In R/T, *report, advise, say* will usually be used instead of plain English questions. Plain English may be used in situations requiring longer explanations.

b **01.09** Listen again and ask a question to clarify the original message using words and phrases from the Language Focus box.

c **Pilots → p147** **ATCOs → p157** **Take turns to ask and answer questions.**

ATCO cue	Pilot cue
Passengers on board	238

ATCO *How many passengers are there / do you have on board?*
Pilot *There are / We have 238 passengers on board.*

LANGUAGE FOCUS: Making requests

***Request** higher level*	***May I** amend our flight plan?*
***Say** again*	***Would you** confirm our ETD?*
***Can we** expedite our departure?*	***Have** an ambulance standing by.*
***Will you** hold?*	***Could you** stand by ten minutes?*

11a **Which of the requests in the Language Focus box are in standard phraseology? When would you say the others?**

b **1.10** **Listen to ten situations and make an appropriate request to solve the problem.**

Situation *On approach, after an in-flight turnback, you are just over your maximum landing weight.*

A (Pilot) *We need the longer runway. Request emergency services standing by. Request instructions to dump three tonnes of fuel.*

Abbreviations

12a **Complete the table. Match the abbreviations and acronyms to the explanations (1–12).**

AIRPROX TCAS ATIS RVR EGPWS ETOPS
IAF ILS in.Hg LDA MSA RVSM

1	the combination of localiser and glideslope	5	the rules by which the vertical separation between aircraft can be reduced	9	ICAO provision permitting twin-engine aircraft to fly more than 60 minutes from a diversion airfield
2	distance over which runway markings and lights are visible	6 *AIRPROX*	the situation in which two aircraft come dangerously close	10	the altitude below which aircraft must not descend in the terminal area
3	the length of runway which can actually be used during touchdown and landing	7	the point at which the first segment of an instrument approach begins	11	the automated system to provide updated aerodrome and meteorological information
4	airborne system designed to avoid aircraft collisions	8	aircraft system designed to warn crew of aircraft approaching terrain	12	the unit of measurement used for barometric settings in North America

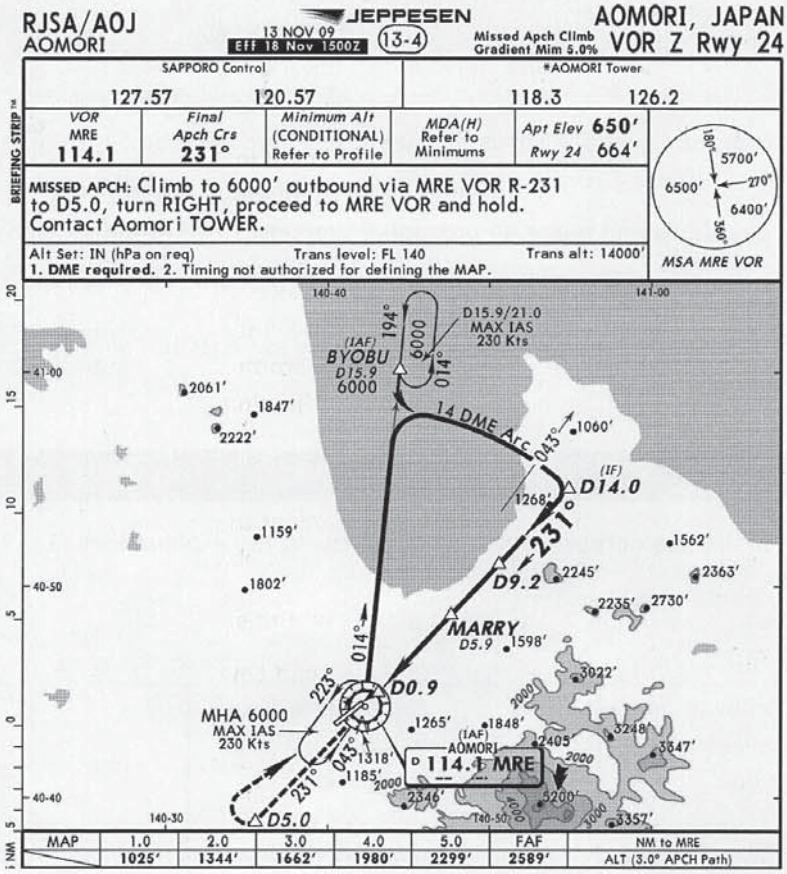
b **1.11** Listen to these abbreviations and identify the order in which you hear them.

	AAL		ACC		ACARS		ASI		EFIS
	ETA		IAS		INS	*1*	IRS		OAT

c Identify the abbreviations in Exercise 12b.

d **1.11** Listen again and repeat the abbreviations.

e What abbreviations can you see on this chart? Say what they mean.



13 Look at the words (a–l) below, which you may encounter in an operational environment. Match them to the definitions (1–12).

1 period of team work
2 discontinuing an approach and performing a circuit for a new approach
3 heading issued to an aircraft for the purpose of providing navigational guidance
4 trajectory followed by the crew at a given gradient (typically 3°) during approach
5 rotating the nose of the aircraft to cause touchdown
6 narrow piece of paper or cardboard, or electronic equivalent, containing information about a flight for the ATCO
7 assigned departure time frame
8 fine rain
9 place where aircraft stop before lining up on the runway
10 parts of the apron, taxiways and runways which are in concrete or bitumen
11 loss of engine combustion
12 form of delaying action by performing a 360° turn

a holding point
b flare
c go-around
d orbit
e drizzle
f flame-out
g vector
h shift
i paving
j strip
k glide path
l slot

American and British English

14a **Look at the pairs of words and identify which are written with American spelling and which with British spelling.**

1 center	centre
2 color	colour
3 downdraught	downdraft
4 gage	gauge
5 leveled	levelled
6 programme	program
7 stabiliser	stabilizer
8 tyre	tire

b **Look at the pairs of terms (1–10) below. For each pair, identify which is the American English and which is the British English usage.**

1 handoff *American*	handover *British*
2 traffic pattern	traffic circuit
3 hold	stack
4 airplane	aircraft
5 jetway	airbridge
6 hPa	in.Hg
7 ramp	apron
8 visibility: statute miles	visibility: kilometres
9 clear the runway	vacate the runway
10 disembark	deplane

ICAO FOCUS

"When we experience problems, it's not that this has necessarily caused me to make a wrong turn or do something incorrectly; the problem that I feel it has caused is the communication and the deciphering of what it is exactly that they want us to do takes a little bit of time and puts us behind the aircraft."

quoted in *United States Airline Transport Pilot International Flight Language Experiences – Report 2: word meaning and pronunciation* (National Technical Information Service)

- **Describe any personal experiences in which communication caused you to be 'behind the aircraft'.**
- **Why is it better not to be 'behind the aircraft'?**

c **What other differences do you know between American and British English?**

d **Why do you think that *Taxi into position and hold* and *Descend Level two-ten* are not part of approved ICAO phraseology?**

15a **1.12 Listen to the same transmissions spoken by six different people from different parts of the world. Can you identify which countries or regions they are from?**

b **In your operational experience, which accents have caused you the most problems?**

Putting it together: Standard phraseology and plain language

Preparation

16a **Look at the transmissions (1–10). Are they in standard phraseology, non-standard phraseology or plain language?**

1 Cleared straight-in ILS approach Runway 27
2 Are you going around?
3 Line up. Be ready for immediate departure.
4 Regional 748, line up in turn.
5 There is a dog on the runway.
6 Taxi into position and hold.
7 Taxi to holding position
8 We have a hydraulic leak.
9 Extend downwind, you are Number 2. Number 1 is the 737 on three-mile final.
10 There is standing water on Runway 19.

ICAO FOCUS

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

ICAO Annex 10, Volume ii, 5.1.1.1

Describe a situation in which you have needed to switch from standard phraseology to plain language.

b **Look at the transmissions (1–8), which explain why you are unable to comply with an instruction or a request, and complete them with the words in the box.**

minimum	turn-off	direct	failure	blind	IMC	heavy	visibility

1 Unable to climb FL 370: we are too *heavy*.
2 We cannot expedite our departure: we seem to have a pneumatic _____.
3 Unable reduce our speed. We are already at our _____ clean speed.
4 Unable to route you to Calgary. The runways are closed due to low _____.
5 I am unable to clear you _____ Madras: there are military exercises in the airspace.
6 Negative contact: we are in _____.
7 We cannot exit by the first _____: we are making a flaps-up landing.
8 I'm unable to tell you the aircraft type ahead of you: I have a _____ spot on my screen.

Communication

17a **1.13 ATCOs Listen to ten pilot requests. Respond saying you are unable and why.**

Pilot *Request Taxiway Echo.*
ATCO *Unable. There is work in progress along the taxiway.*

b **1.14 Pilots Listen to ten controller requests. Respond saying you are unable and why.**

ATCO *Adjust speed to cross Bologna at 28.*
Pilot *Unable. We are already at our minimum operating speed.*

18 **Pilots → p147 ATCOs → p157 Take turns to ask questions to check understanding.**

ATCO *There is a chance of hailstorms beyond Abbotsford.*
Pilot *Do you mean there may be hail? / So we could encounter hail on our route?*

ICAO FOCUS

"Development of* proficiency *in fluency and interaction will be dependent on:

- ***clearly identifying the impacts of "code switching" between standard phraseology and plain language***
- ***identifying appropriate and effective checking mechanisms ..."***

Dr Jeremy Mell, *ICAO Journal*, Volume 59

- **Give an example of a checking mechanism.**
- **Why are checking mechanisms important in communication?**

Debriefing

19 **Debrief Exercises 17 and 18 with the class. Discuss those aspects which you found most challenging.**

Progress check

1 Complete the progress check for this unit. Assess your proficiency in these areas.
(1 = I need more work on this, 5 = I feel confident in this area)

■ I can see how language can be misunderstood.	1	2	3	4	5
■ I can recognise different communication tasks in radiotelephony.	1	2	3	4	5
■ I can distinguish between standard phraseology and plain language.	1	2	3	4	5
■ I can give instructions and make readbacks.	1	2	3	4	5
■ I can correct erroneous readbacks.	1	2	3	4	5
■ I can request clarification and make requests fluently.	1	2	3	4	5
■ I can say why I am unable to comply.	1	2	3	4	5
■ I can check to make sure I have understood information.	1	2	3	4	5

2 Choose three areas of communication from this unit which you are less confident in. Make plans for improving your skills in these three areas.

UNIT 2
Ground movements

COMMUNICATION FUNCTIONS

- Communication errors: failure to acknowledge correctly (ATCOs)
- Confirming and clarifying
- Requesting confirmation
- Describing the seriousness of a situation
- Giving instructions and resolving problems
- Detailed taxi instructions
- Handling turnaround incidents

Lead in

> **A typical day at any busy aerodrome anywhere in the world: dozens, sometimes hundreds, of vehicles and aircraft transit active runways every hour. For the most part, all of them get where they are going without incident. Occasionally, however, someone makes a mistake. Perhaps it is a pilot who is arriving at an unfamiliar field. Or maybe it is a poorly-trained vehicle driver who takes a short cut across a seemingly inactive runway. Or possibly it is a busy air traffic controller who momentarily forgets a particular aircraft. Any one of these mistakes could result in a runway incursion – a serious compromise to aerodrome safety that could easily result in a catastrophic collision and loss of life.**
>
> **Dr Assad Kotaite, the former President of ICAO, *ICAO Runway Incursion video***

1a **Apart from aircraft, what other vehicles move around the airport?**

b **What makes an airport such a potentially dangerous place?**

c **What examples of mistakes made by pilots, drivers and controllers have you encountered?**

Airport layout

2a **Label these signs and markings from international airports with the definitions below. What is the difference between a marking and a sign?**

runway holding position sign outbound destination sign taxiway ending marking no-entry sign
runway exit sign ILS critical area sign runway centreline marking taxi location sign

a

b

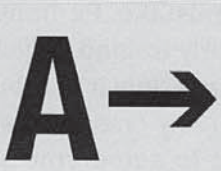
c

d

e

f

g



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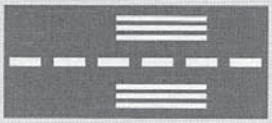


b **How far do airport signs vary from country to country? In what way can these variations create difficulties?**

c **1.15 Listen to eight ATCO transmissions to pilots. Mark the order in which you hear the markings and signs referred to in Exercise 2a.**

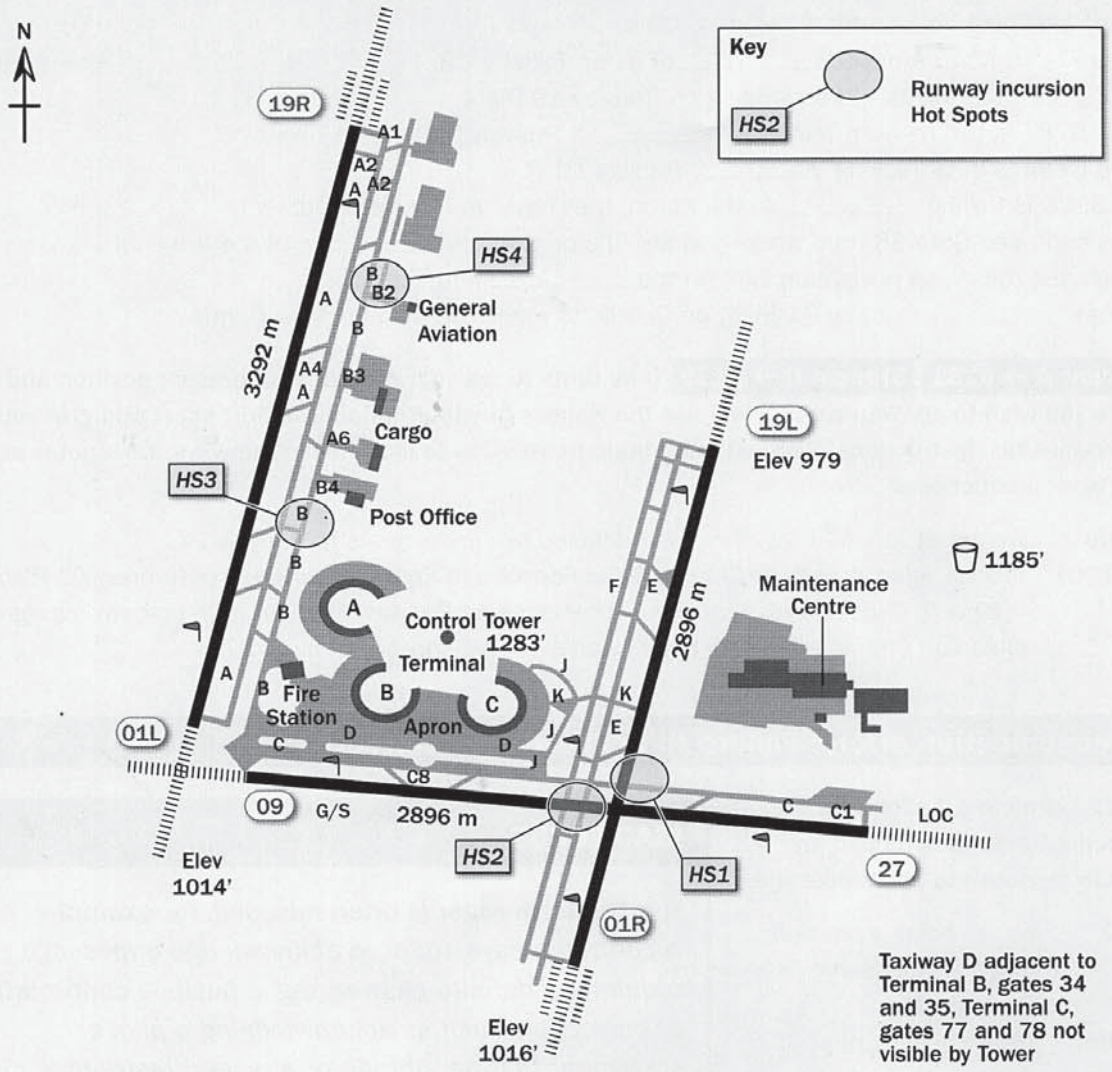
3a **In pairs, look at the airport chart on page 19 and brainstorm as many different airport areas, buildings and equipment as you can.**

Airport areas	Airport buildings	Airport equipment
apron	*hangar*	*glideslope antenna*

b **Describe what these areas, buildings and equipment are used for. Which are most important for pilots and controllers to be familiar with?**

c **Match these airport facilities, services and equipment to their short definitions.**

1 apron	a service which provides flight crew with flight data
2 blast fences	b place where taxiways or runways cross each other
3 de-icing gantry	c part of aerodrome security which prevents intrusions
4 dispatch	d parking position
5 engineering	e open area in front of terminal or hangar
6 intersection	f part of ILS equipment
7 localizer	g service which keeps runways available in winter
8 perimeter fence	h barriers used to protect people, vehicles etc. from engine thrust
9 snow clearance	i department in charge of aircraft maintenance
10 stand	j used in cold conditions to spray aircraft



4 **1.16** Look at the chart based on Kansas City International Airport and decide if the information you hear is True (T) or False (F).

1 _____ 3 _____ 5 _____ 7 _____
2 _____ 4 _____ 6 _____ 8 _____

5a Words of location and movement are used constantly in aviation language. Match the words in the box to their opposites in the table.

LANGUAGE FOCUS: Location and movement

out from outgoing into from under along inbound
forward far behind off right

	across		near
	aft		on
	ahead		out of
	back to		outbound
	incoming		over
	left		to

b **Complete the sentences using the words from Exercise 5a.**

1 They are lining up ___*on*___ Runway 09.
2 There is an A340 stopped _____ of us on Taxiway C8.
3 All _____ flights will be landing on Runway 19 Right.
4 The B787 is taxiing from Terminal A _____ Runway 01 Left via Taxiway B.
5 The B744 is backtracking _____ Runway 01 R.
6 IB 3268 is taxiing _____ to the apron; they have an electrical problem.
7 You can't see Gate 38 from where you are. It's on the _____ side of the terminal.
8 I can see the green navigation light on the _____ wing tip.
9 Cross _____ Runway 01 Right on Charlie to reach the Maintenance Centre.

c **Student A → p131** **Student B → p139** **Take turns to tell your partner your present position and where you wish to go. Your partner will use the Kansas City International Airport chart and give you progressive taxi instructions. Request and obtain permission to cross active runways. Take notes and read back instructions.**

A (Pilot) *We are at Terminal C and request detailed taxi instructions to Runway 27.*
B (ATCO) *Taxi via Juliet to Taxiway Charlie. Cross Foxtrot and Echo. / Hold short of Runway 01 Right – 19 Left. Request cross runway. / After crossing Runway 01 Right – 19 Left, taxi straight ahead on Charlie to holding point Charlie 1. Hold short of Runway 27.*

Communication errors: Failure to acknowledge correctly

6 **O1.17 Listen to 12 pilot and controller transmissions and give a definite response to each message.**

ATCO *Taxi to holding position Bravo 2. Hold short Runway 28.*
A (Pilot) *Taxi to holding position Bravo 2. Hold short Runway 28.*

ICAO FOCUS

"The term roger is often misused, for example: A controller says, roger to acknowledge a message requiring a definite answer (e.g. a positive confirmation or correction, such as acknowledging a pilot's statement that an altitude or airspeed restriction cannot be met)."

Flight Safety Foundation *ALAR Briefing Note 2.3: Pilot-Controller Communication*

A correct use of *roger* could be:
Pilot Cannot reduce speed below 200 knots.
ATCO Roger. Continue present speed. Expect radar vectoring. Will advise.

Say in your own words why and when *roger* can be dangerous.

Confirming and clarifying

7a **O1.19 Listen to and repeat these alphanumeric references, call signs and values.**

1 124.325 MHz
2 1009 hPa
3 P/N 46729178E
4 245°
5 Condor 1438
6 312 knots
7 1,200 fpm
8 Mach 0.79
9 3° slope
10 29.98 in.Hg
11 109 tonnes
12 ETD 17:58

b **Say them again without listening to the recording.**

c **What does each one refer to?**

124.325 MHz is a radio frequency.
1009 hPa is an atmospheric pressure or altimeter setting.

8a **1.19 Listen to ten transmissions. Each one contains alphanumeric information. Check that what you hear agrees with the data below. Correct any data that is incorrect.**

1 Austral 283 / 15
2 RWY 25 / DLH 27
3 Avianca 537 / 45
4 second / 14
5 757 / Runway 17
6 BHQ / 18 / M
7 AA 757
8 35 / Thai 687
9 A330 / 49
10 China Eastern 295 / S19 / L

ATCO *Avianca 357, slot time 45.*
A *Correction: Avianca 537, slot time 45.*

b **1.19 Listen again and request confirmation for each transmission.**

ATCO *Air Austral 283, expect departure at time 15. Start up at your discretion.*
Pilot *Confirm departure 15, Austral 283.*

LANGUAGE FOCUS: Adverbs

Adverbs allow you to give clearer and more precise information about a situation and so improve situational awareness.

The servicing cart ***only slightly*** *scratched the fuselage. The mechanics will check, but we should not be delayed.*

A flight attendant was ***severely*** *concussed when we braked* ***hard****. We will be returning to the gate.*

Adverbs qualify:
1 adjectives: ***very*** *hot*, ***quite*** *late*, ***rather*** *delayed*, ***slightly*** *damaged*, ***particularly*** *dangerous*
2 verbs: *landing* ***shortly***, *taxi* ***slowly***, *stop* ***immediately***, *proceed* ***with caution***
3 other adverbs: ***very*** *frequently*, ***quite*** *well*.

Many adverbs end in *-ly*: ***quickly***, ***gradually***, ***accidentally***, ***carefully***, ***completely***

Adverbs can be used to make meaning stronger: ***very***, ***extremely***, ***severely***, ***badly***

Or to make meaning weaker: ***slightly***, ***a little***, ***hardly***, ***scarcely***

NOTE: Some adverbs are amongst the most commonly used words in English: ***very***, ***well***, ***quite***, ***only***, ***often***, ***always***, ***never***, ***now***, ***almost***, ***nearly***, ***hard***, ***soon***, ***still***, ***just***, ***yet***, ***straight away***, ***too***, ***as soon as possible***, ***a lot***.

9a **Complete the sentences using the adverbs in the box.**

severely almost a little very soon only just hard

1 Taxi with caution, as the airport is ___*very*___ congested.
2 Boarding is _____ completed. We should be ready to push back in five minutes.
3 The ground crews are working very _____ to make sure we get away on time.
4 Some of the passengers were late arriving at the gate; we'll need _____ more time.
5 We have _____ closed the doors and are ready to depart.
6 When the servicing truck reversed into the RH engine, it _____ damaged the cowling.
7 There is _____ one container waiting to be loaded.
8 Can you vacate your stand as _____ as possible?

b **1.20** **Listen and repeat. Pay special attention to phrasing and stress.**

1 *Taxi with caution // as the airport is very congested.*
2 *Boarding is almost completed. // We should be ready to push back in five minutes.*

10 **Student A → p131** **Student B → p139** **Take turns to clarify information. Say whether the situations are more (+) or less (–) serious. Use the correct phrasing and stress.**

A (ATCO) *The flight is delayed.*
B (Pilot) *How much is it delayed?*
A (–) *It's slightly / a little / hardly delayed.*

B (Pilot) *The nose gear is damaged.*
A (ATCO) *How badly is it damaged? Are you able to continue taxi?*
B (+) *It is severely/badly/very damaged.*

11 **Student A → p131** **Student B → p139** **Take turns to ask for and give clarification. Your partner will describe a situation encountered on the apron or taxiways. Ask your partner to clarify the situation by giving you more information.**

A (Pilot) *Turk Air 450, we've got a 20-minute delay for start-up. / Our start-up is delayed 20 minutes.*
B (ATCO) *What's causing the delay? / What's the cause of the delay? / Why is there a delay? / Why are you delayed?*
A *The airbridge at Gate 23 is unserviceable and the passengers will have to board by the apron.*

12a **Work in pairs. What do these abbreviations mean?**

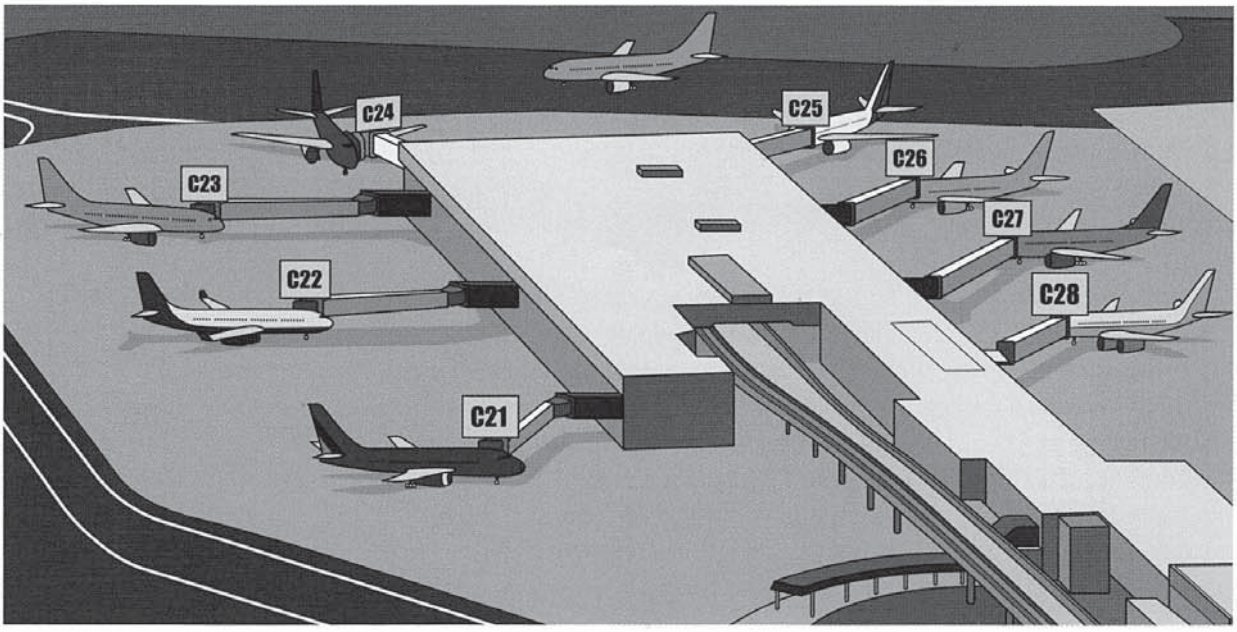
a ATC	d UTC	g QFE	j ILS
b FOD	e ATD	h VHF	k RVR
c NDB	f GPU	i ETD	l VOR

b **1.21** **Listen and mark the order you hear the abbreviations in Exercise 12a. Then practise saying them.**

c **Student A → p131** **Student B → p139** **Take turns to read the abbreviations and acronyms on your page to your partner. Ask your partner what they mean and discuss what they refer to.**

Start-up approval and taxi instructions

13a **1.22** **Listen to eight pilot requests for start-up and identify the call signs and destinations of their aircraft.**



b **1.22 Listen again and give start-up approvals and departure information to each flight using the data in the table below.**

Approval	SID	Transponder code	Approval	SID	Transponder code
1 Expect 45	1S	5023	5 Discretion	1R	3561
2 Approved	2L	4077	6 Approved	3Q	2317
3 Discretion	1F	5662	7 Expect 1 hour	2W	5062
4 Start up 12	3H	7044	8 Start up 55	1E	2425

Pilot *Thai 236, Gate 24, request start-up for New Delhi.*
A (ATCO) *Thai 236, expect start-up at time 45, clearance to New Delhi, one Sierra departure, squawk 5023.*

c **1.22 Listen again and explain why start-up approval cannot be given at the moment. Use the data in the table below.**

1 departures / on hold / thunderstorm / overhead	5 Error in flight plan / ETD transmitted in local time
2 United B767-300ER / blocking apron / expect 15 min.	6 Delay in departures / aircraft in line / will advise
3 Departure runway closed / emergency landing	7 VIP flight expected / departures on hold / expect 35
4 Computer failure / switching to back-up / expect 30-minute delay	8 RVR 300 m / traffic slowed down / 1-hour delay

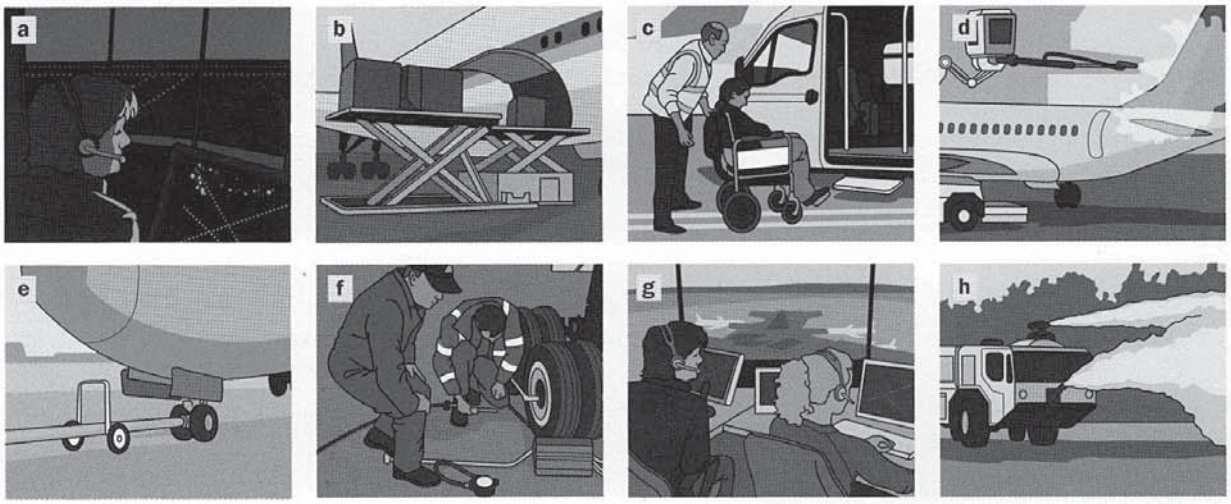
Pilot *Thai 236, Gate 24, request start-up for New Delhi.*
A (ATCO) *Thai 236, sorry, all departures on hold due thunderstorm overhead.*

Physical characteristics

14a **In pairs, brainstorm words to describe objects, situations and events at the airport.**

condition	colour	size	shape	feature	material
closed *congested*	*blue* *black*	*large* *wide*	*rectangular* *square*	*dark* *heavy*	*rubber* *glass*

b **1.23 Listen to communications about eight airport situations and match them to the correct pictures below.**



c **Work in pairs. Each choose four of the pictures in Exercise 14b. Then take turns describing the situations in the pictures to your partner.**

A *This is a view from the control tower at night. You can see some illuminated screens and a controller looking out at the apron ...*

d **Student A → p131** **Student B → p139** **Take turns to describe familiar objects in your list to your partner without giving the name or function of the object. Your partner will try to guess what the object is.**

A *It's between two and three metres long, about 1.80 metres high and 1.50 metres wide. It has four small wheels and a connection for towing. There is an instrument panel on one side with a voltmeter, ammeter and frequency indicator. Inside there's a motor which drives a generator. It has large black cables which can be connected to the aircraft. You'll usually see it at the parking stands.*

B *Is it a GPU?*

Handling turnaround incidents

15a **In pairs, decide what each of the words/phrases in the box refers to.**

LANGUAGE FOCUS: Describing incidents

bogged down cut flat scratched broken damaged frozen smoking
broken down defective inoperative (inop) seeping burst deflated jammed
snowbound cancelled delayed leaking spilled collapsed dented lost
stuck congested failed missing twisted contaminated faulty overflowing
unserviceable (U/S) cracked on fire overheated worn

The landing gear can be bogged down.

b **Give examples of incidents you have encountered during turnaround using the words for describing incidents above.**

16 **Complete these sentences using words from Exercise 15a. Note there may be more than one possible correct answer.**

1 The First Officer has severe food poisoning and, as there is no relief crew, the flight has been *cancelled / delayed*.
2 A union on the hydraulic lines is _____ and maintenance is replacing a seal.
3 The Embraer left Taxiway N and its nose gear is _____ on the grass.
4 The GPU at our stand is _____ and we are waiting for a replacement.
5 The F/O noticed that the flaps were _____. We'll need de-icing before departure.
6 The catering truck hit the fuselage while it was moving into position and the door sill is slightly _____.
7 One of our main gear tyres is showing only 40 psi. It is _____ and will have to be replaced.
8 We flew through an electric storm during descent and four of our static dischargers are _____.

17a **1.24** **Listen to ten transmissions and match them to the turnaround and ramp area incidents (a–j) below.**

a passengers missing
b wing tip damaged
c tyre to be replaced
d aircraft run off taxiway
e incorrect baggage
1 f taxiway blocked
g tractor unserviceable
h incorrectly positioned at the gate
i fuel overflow
j APU failed

b **1.24** **Listen again and take notes about each incident. Then, in pairs, describe the situations to each other and suggest solutions.**

A (Pilot) *We are unable to push back because a servicing truck is blocking the inner taxiway.*
B (ATCO) *I will have the driver instructed to leave the area as soon as possible.*

Putting it together: Detailed taxi instructions

Preparation

18 Describe the layout of this aerodrome. In what ways is it particular? What special precautions do you think are required? What are the differences between RWY 20L and 20R? Where is the terminal building?

Santos Dumont Airport, Rio de Janiero.

19a **1.25** Listen to ten words and complete the endings.

1 safe*ly*	3 fail ___	5 miss ___	7 slight ___	9 crack ___
2 complete ___	4 strong ___	6 spill ___	8 difference ___	10 correct ___

b **1.25** Listen again and practise saying the words aloud.

> **Airport layout or infrastructure has affected situational awareness, distracting or confusing flight crews. A common example involves airports where a single taxiway serves multiple runway thresholds. Less than optimal geometries also increase the risk of the flight crew unintentionally taxiing onto the wrong runway, possibly one too short for take off.**
>
> Michel Trémaud, *Erasing Confusion,* Flight Safety Foundation *AeroSafety World,* May 2010

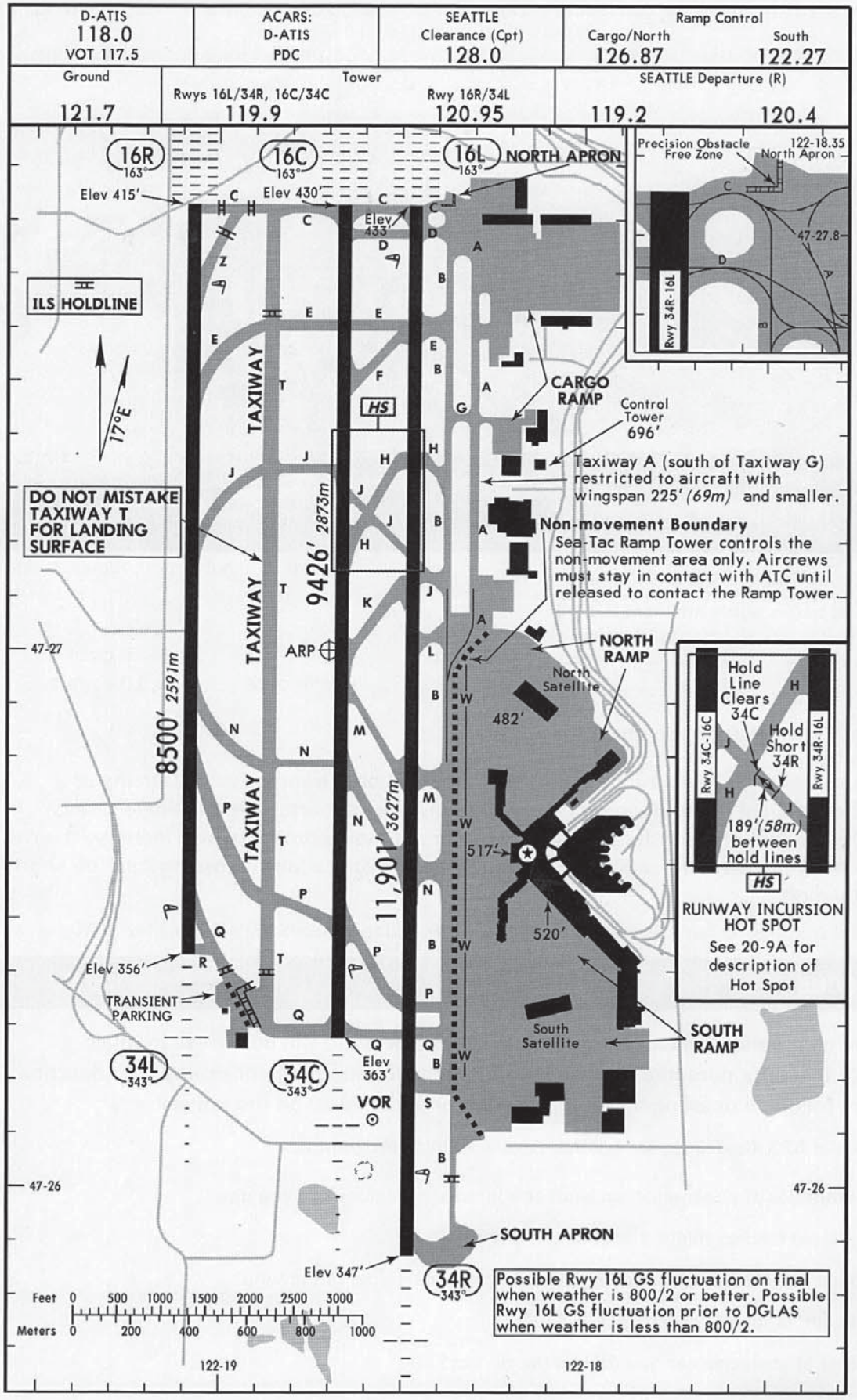
ICAO FOCUS

> **… in non-routine, unusual or abnormal situations, there will be a need for plain language to clarify, paraphrase or provide additional information, for example, to describe a system failure, a passenger's state of health or an obstacle on the runway.**
>
> ICAO Circular 323, *Guidelines for Aviation English Training Programmes*

- What examples of non-routine, unusual or abnormal situations can you give?
- What system failures might a controller experience?
- What system failures might the flight crew experience during turnaround?
- What health problems could you encounter?
- What sort of obstacles can you find on the runway?

20 **Answer the questions.**

1 Where does a single taxiway serve multiple runway thresholds on this airport?
2 What increases the risk factor in this example?
3 What other things might make operations difficult from this airport?



Communication

21 **Student A → p131** **Student B → p139** **Take turns to give your present position on the chart on page 26 to your partner and say where you wish to taxi to. Your partner will give you progressive detailed taxi instructions from one point to another. Take notes and read back instructions.**

A *Request taxi instructions from north cargo ramp to Runway 34 Centre.*

B *Taxi south on Bravo past control tower and main terminal. Turn right onto Taxiway Quebec and hold short of Runway 34 Right. When cleared to cross Runway 34 Right, continue on Quebec and hold short of Runway 34 Centre. Contact Tower 119.9.*

22 **Student A → p132** **Student B → p139** **Take turns to describe a problem or question you are facing. Your partner will instruct you.**

A *There is a 737 approaching from our right on Taxiway Kilo.*

B *Give way to 737 from right to left.*

Debriefing

23 **In groups, report back about the different stages and types of communication in the detailed taxi instructions and in the process of problem reporting and solving. How far did you find that your interactions were effective, clear and fluent?**

Progress check

1 Complete the progress check for this unit. Assess your proficiency in these areas.
(1 = I need more work on this, 5 = I feel confident in this area)

■ I can describe the airport environment.	1	2	3	4	5
■ I can give and correct instructions and information.	1	2	3	4	5
■ I can describe where things are located.	1	2	3	4	5
■ I can describe the seriousness of a situation.	1	2	3	4	5
■ I can request and give clarification.	1	2	3	4	5
■ I can communicate information about handling turnaround incidents.	1	2	3	4	5
■ I can give advice and resolve taxiing problems.	1	2	3	4	5
■ I can give detailed taxi instructions.	1	2	3	4	5

2 Choose three areas of communication from this unit which you are less confident in. Make plans for improving your skills in these three areas.

DVD Unit 2

Danger on the runway

24a **Watch Part 1 of a Transport Canada clip, *Danger on the Runway* (0.00 – 1.55), and answer these questions.**

1 What are the weather conditions?
2 What is this kind of incident called?
3 What is the main cause of this particular incident?

b **Discuss:**

1 Why does the truck driver enter the active runway?
2 How do you think the incident could have been avoided?

25a **Read this transcript of the communications between the driver and the Flight Service Specialist. Watch the incident again and complete the transcript.**

Driver	*Truck two-zero leaving garage for Air Eastern hangar.*
Flight Service Specialist	*Truck two-zero, proceed via 1 ___, ___, ___ . Hold short of runway one-four, traffic on final.*
Driver.	*Um, roger. 2 ___, ___, ___, hold short of one-four; truck two-zero.*
Flight Service Specialist	*Truck two-zero, that's 3 ___, ___ .*
Driver	*Roger.*

b **Discuss:**

1 According to the clip, why didn't the truck driver ask for clarification of the directions?
2 What is the danger of using 'roger' instead of reading back an instruction?

26a **Watch Part 2 of the clip (1.56 – 4.00) about another runway incursion incident. It involves three aircraft. Watch carefully and make two sentences about each aircraft, using sentence endings a–f.**

Express 3525	a) is able to clear the other aircraft when taking off.
	b) is on final approach.
Citation B77	c) is running late.
	d) has to pull up and go around.
Tannair 79	e) is cleared for take-off on runway 6L.
	f) mishears an instruction and taxis across the active runway.

b **Watch the clip again with subtitles. Do you notice anything about the phraseology used? Where are the key mistakes made? How could the incident have been avoided?**

27a **Work in pairs. Discuss the different causes of runway incursion with your partner. Make a list of recommendations for best practice in avoiding runway incursions for pilots and Air Traffic Control Officers.**

b **Now watch Part 3 of the clip (4.01 – 5.52) and compare the conclusions with your own recommendations.**

UNIT 3
Communication on the ground

COMMUNICATION FUNCTIONS

- Communication errors: failure to acknowledge correctly (pilots)
- Reporting anomalies
- Describing what you can see, hear and feel
- Asking for clarification
- Responding to problems
- Managing a departure
- Coordinating actions

Lead in

> "Airlines today want shorter turnaround times at airports and zero ground accidents."
> Magnus Bjelkerud & Espen Funnemark

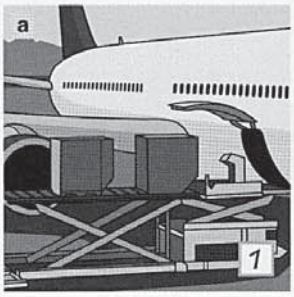
1a What has been your experience of efforts to reduce turnaround times?

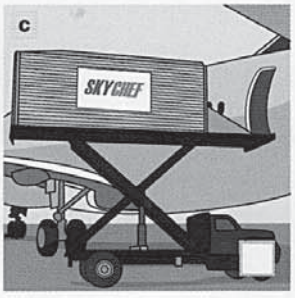
b Describe some of the measures taken to improve safety on the ground.

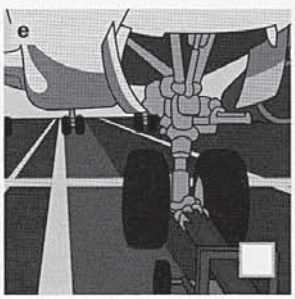
c Which people do you think are most affected by delays?

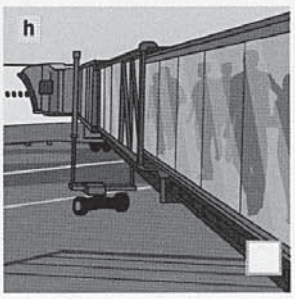
Ground operations

2a Identify the different turnaround activities in these pictures.









b In pairs, decide in which sequential order the turnaround activities take place.

c What personnel are involved in turnaround operations?

d In your experience, which personnel do the flight crew have the most contact with during turnaround?

e Which personnel do ATC (Ground) interact with?

3a Which phases of turnaround have an impact on ATC activity?

b A Flight Safety Foundation study found that one phase of turnaround was more dangerous than the others. Which of these phases do you think it is? Discuss the reasons for your choice.

preparing the stand parking the aircraft handling the arriving flight
handling the departing flight pushback / taxi out de-icing

4 **1.26** Listen to eight transmissions and match them to the pictures in Exercise 2a.

> Their analysis showed that safety was being put at risk by the time pressures created during the turnaround.
>
> Det Norske Veritas risk analysis of ground handling in Norway, quoted in FSF *Under New Management*, *AeroSafety World*, July 2008

5a In your experience, what kind of time pressures do personnel in aviation face during turnaround? In pairs, discuss the time pressures for the following people.

- pilots
- ATCOs
- dispatchers
- engineers
- ground crews
- cabin crews
- passenger handling agents

b Report back to the class about what these people do during turnaround and your conclusions about the pressures they face.

6a **1.27** Listen to eight transmissions. In each one a particular turnaround activity is referred to. Identify each activity.

1 *loading* 5 _____
2 _____ 6 _____
3 _____ 7 _____
4 _____ 8 _____

b What do all these words have in common grammatically?

7a **1.28** Listen to six ATCO–pilot exchanges. What does the pilot say is being done each time?

1 *starting* 4 _____
2 _____ 5 _____
3 _____ 6 _____

b What do these words have in common grammatically?

LANGUAGE FOCUS: *-ing*

You find many cases of verbs ending in *-ing* in English. They are often used in RTF communications when:

1 the verb is preceded by the verb *to be* and/or indicates a present or ongoing action.
***Holding** short of Runway 36R.*
***Crossing** the intersection Delta.*
*We **are waiting** for the gate to be free.*
*It **is raining**.*

2 the *-ing* form indicates an activity:
loading**, **cleaning**, **towing**, **servicing**, **docking**, **reporting**, **holding**, **converging**, **incoming
Words like this are often used in compound nouns:
cargo loading, loading procedure, cabin cleaning, cleaning materials, aircraft towing, oil servicing, docking guidance system, incident reporting, holding point, converging traffic, incoming flights

In standard RTF the verb *to be* and the pronoun (*we, I*) are omitted when used to confirm an instruction or make a request:
ATCO *You are clear to start up.*
Pilot *Roger. **Starting up.***

8a **1.29 Listen to ten ATCO-pilot instructions and respond affirmatively, saying that you are complying or in the process of doing the action.**

ATCO *Stand by for further instructions.*
A (Pilot) *Standing by.*

b **In pairs, find other examples of activities and compound nouns used in operations.**

loading, catering truck

9 **Match the actions ending in *-ing* (1–8) to the words (a–h) to make compound nouns.**

1 braking	a gate
2 leading	b personnel
3 parking	c flights
4 warning	d action
5 boarding	e point
6 outgoing	f bay
7 ground handling	g edge
8 holding	h light

10 **Pilots → p148** **ATCOs → p157** **Take turns to report situations and ask for more information. The pilot will report a situation to the apron coordinator. The coordinator will ask for more information about what is happening or what the flight crew is doing and ask how long the action will take. Then change roles.**

Pilot *Our cargo loading system is unserviceable. We have called Engineering.*
Apron coordinator *What is the engineer doing now?*
Pilot *He's replacing the drive motor.*
Apron coordinator *When do you expect to be ready to push back?*
Pilot *We expect to be ready to push back in 30 minutes.*

Ground equipment

11a **Use the table to identify the nine types of ground equipment in the photos. Some have several names, so use the name you are most familiar with.**

GROUND EQUIPMENT

Access	Servicing	Clearance	Technical	Emergency
airbridge, jetty, walkway, jetway	baggage cart, trolley, dolly	sanding truck, gritting truck, gritter	ASU (air start unit)	ambulance
passenger steps, stairway, airstairs	conveyor, bulk loader	snow blower	GPU (ground power unit), ground cart	fire engine, fire truck
passenger coach	high lift, hydraulic loader	suction sweeper	fuel bowser	foam crash tender
crew minibus	catering truck	snow plough	tanker	follow-me car, leader van
mobile lounge	water servicing truck	de-icing vehicle	push-back vehicle, tow vehicle, tractor, tug	friction tester
nose-in docking system	lavatory service truck	de-icing gantry	tow-bar	police car
steps, access platform	fork-lift truck	surface cleaner	run-up area	

h

b **1.30** Listen to eight crew communications describing situations and requesting different types of ground support. Identify the ground equipment which they require from the photos in Exercise 11a.

1 _____ 3 _____ 5 _____ 7 _____
2 _____ 4 _____ 6 _____ 8 _____

12 **Student A → p132** **Student B → p140** Take turns to describe situations and give advice. Describe your situation to your partner and make a request. Your partner, acting as an apron controller, will advise you of what action will be taken. Focus on fluency and phrasing.

A *Apron Control, Air France 396. We are an Airbus 321 at Stand Tango 18. Our APU is inoperative. Request GPU before engine shutdown.*

B *Air France 396, roger. Dispatching GPU immediately to Stand Tango 18.*

Communication errors: Failure to acknowledge correctly (pilots)

13 **1.31** Listen to ten controller transmissions. Give a proper readback to each one or, if you have not fully understood, request confirmation or clarification.

ATCO *Aeromexico 562, follow the B787 from the left, taxi to holding point Echo 2 Runway 17.*

A (Pilot) *Following B787 from the left, taxi to holding point Echo 2, Runway 17, Aeromexico 562.*

ICAO FOCUS

"A pilot says* roger *(instead of providing a readback) to acknowledge a message containing numbers, thus preventing any effective hearback and correction of errors by the controller."

Flight Safety Foundation *ALAR Briefing Note 2.3: Pilot-Controller Communication*

What are the differences between pilot and controller readback?

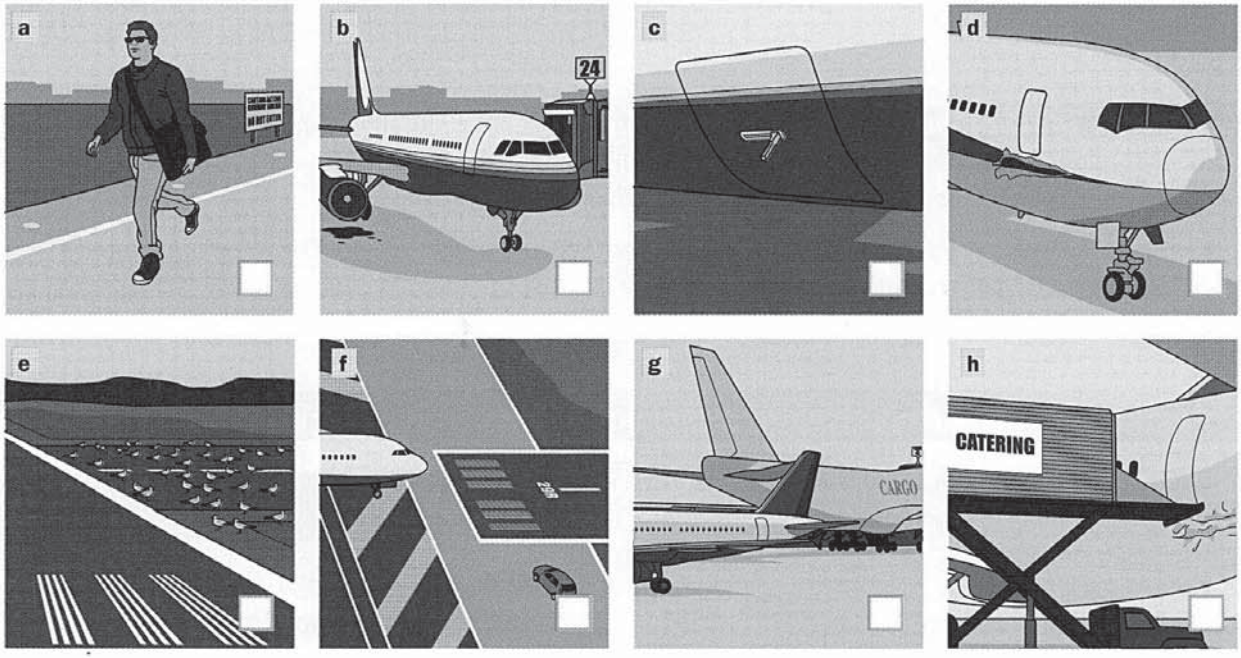
Reporting anomalies

14a Pilots often talk about phenomena to describe the situations they see. Match the phenomena (a–j) with their short explanations (1–10).

a hard landing b metal debris c snow drift d damaged wing tip e strong odour
f severe windshear g loud bang h stray dog i rough pavement j dark smoke

1 damage to ground surfaces, which may be the result of a particularly severe winter
2 the result of insufficient clearance during manoeuvring
3 an animal which is running free and can damage aircraft taxiing and taking off
4 caused by sudden changes in wind speed and/or direction
5 the effect of wind on fallen snow
6 the effect of a collision or explosion which you can hear
7 the result of burning oil or fuel which you can see
8 the result of a high rate of descent on touchdown
9 the result of a chemical reaction or combustion
10 parts of the airframe detached after impact or damage

b **1.32** Listen to eight crew reports and match the situations which the pilots and controllers are talking about to the pictures (a–h).



c **Describe the situations in your own words. Then prepare a transmission to warn the appropriate authority.**

d **1.33** **Use the phrases in the Perception box to make complete sentences with the information you hear.**

A (Pilot) *We are experiencing severe vibrations. / We experienced severe vibrations.*

PERCEPTION

Pilots and controllers often have to describe what they can, or cannot, see, hear, feel or smell or what they think is happening. Here are some phrases they use.

SIGHT	SOUND	SMELL
We can see ... *I can't see ...* *We saw ...* *We noticed ...* *We observed ...*	*I can hear ...* *I can't hear ...* *I heard ...*	*I can smell ...* *We smelt ...*
SENSATION	**IMPRESSION**	**JUDGEMENT**
We are experiencing ... *It feels (like) ...* *I can't feel ...* *We experienced ...* *It felt (like) ...*	*It appears ...* *There seems ...* *It doesn't seem ...* *It looks like ...*	*I think ...* *I don't think ...* *I guess ...* *I suppose ...*

15a **O1.34** In pairs, listen to six crew reports and take notes about the location, the aircraft or vehicle involved and the type of anomaly.

Taxiway E2 / United 777 / fire Engine 1
/ dark smoke, flames in tailpipe

b For each incident, prepare and deliver transmissions from the tower to inform the aircraft involved and/or the airport services of appropriate action to be taken.

A (Tower) *United 483, you appear to have a tailpipe fire on your Number 1 Engine. Turn left onto Taxiway Foxtrot and stop three hundred metres from the intersection with Echo. The fire crew are being turned out.*

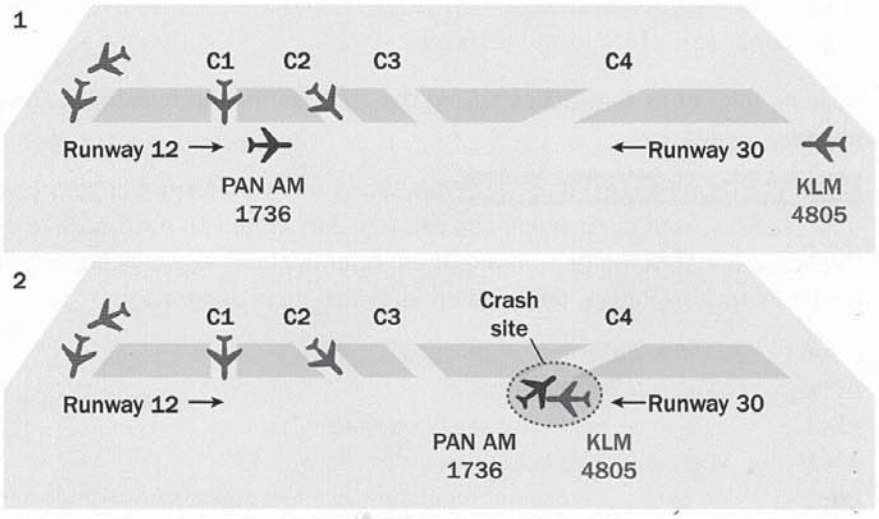
A *Fire service, a United triple seven with what appears to be a tailpipe fire on Taxiway Foxtrot, 300 metres from the intersection with Echo.*

'We're now at take-off'

16a In pairs, describe the events in the two diagrams.

b **O1.35** In pairs, listen to a re-enactment of some of the exchanges between the two KLM pilots, the ATCO and the Pan Am pilot. Make notes about any communication errors you notice, e.g. non-standard phraseology, absence of confirmation or clarification, ambiguity and call sign error.

c Report back and compare and discuss your notes with the rest of the class.



ICAO FOCUS

"A much-quoted case is that of the message ... by the First Officer aboard one of the two aircraft in the catastrophic collision at Tenerife (1977). His use of the phrase "We are now at take-off" was interpreted by the tower controller to mean that he was waiting at the take-off point. Subsequent events demonstrated that he in fact meant that the aircraft was already on the take-off roll."

Dr Jeremy Mell

- Why is the phrase *at take-off* ambiguous?
- What could or should the First Officer have said?
- Was the controller's response appropriate? What might he have said and done?
- Can you think of any other expressions in English which use *at* in this way?
- What do you think we can learn about RTF communications and the English language from this accident?

d **In your experience, how can difficulties in communication be made more serious by bad weather conditions, congested airports, diverted flights and delays?**

e **How do you think that the hierarchical difference between captain and first officer might influence their communication together?**

17a **1.36 We say questions differently from statements. For example, in questions we stress the interrogative words and phrases. Mark the correct stress on the statements with insufficient information and the clarifying questions below. Then listen and check.**

1 ***A:*** *There is traffic coming from our right.*
B: *Can you identify it?*

2 ***A:*** *We're at our gate.*
B: *Which gate are you at?*

3 ***A:*** *I can hear a noise.*
B: *What sort of noise can you hear?*

4 ***A:*** *We are holding.*
B: *Where are you holding?*

5 ***A:*** *I can see something.*
B: *What can you see?*

b **In pairs, take turns to practise saying the statements and questions. Focus on fluency, pronunciation, phrasing and stress.**

c **Pilots → p148** **ATCOs → p158** **Take turns to give information about various ground situations in poor visibility. Your partner will ask you to clarify what you have said, or give additional information. Rephrase the statements to make them unambiguous or provide more precise information. You can continue each exchange until you are satisfied all is understood.**

Pilot *I think we're near Runway 17.*
ATCO *Which taxiway are you on?*
Pilot *I think we're on Taxiway November.*
ATCO *Are you at the holding point of Runway 17?*
Pilot *Negative. We are approaching the intersection of November and Tango.*

A fire emergency

18 **Complete these sentences with the words in the box.**

shut flame disembark maintenance shutting 121.85 exhaust way

1 During your landing you had a big *flame* from your right engine.
2 We had some problems with our engine, so we'll have a check done by our _____.
3 There is still some smoke and occasional flames coming from your _____.
4 The fire service is on its _____.
5 Our engine Number 2 is _____ down.
6 We are _____ down Engine Number 1, too.
7 Can you change to _____?
8 Would you like to _____ your passengers?

LANGUAGE FOCUS: *have something done*

If you don't do something yourself, you have/get it done by someone else.

*We'll **have** a check **done** by our maintenance.*
*I'll **get** the fire service **to cool** your brakes.*
*We'll **have** some more fuel **uplifted**.*
*We **had** a check **done** by maintenance.*
*We **got** the fire service **to cool** our brakes.*
*We're **having** some more fuel **uplifted** now.*

19 **1.37 Listen to ten situations and say what you will have/get done, and by whom, to resolve each one.**

A *I'll get it replaced by maintenance.*

20a **1.38 Listen to a communication between a pilot, a ground controller and the Fire Chief and complete the information.**

1 Call sign	_____	6 New frequency	_____
2 Taxi instructions	_____	7 Firefighters' action	_____
3 Problem observed	_____	8 Crew action on engines	_____
4 1st instruction	_____	9 Means of disembarkation	_____
5 2nd instruction	_____	10 Number of pax injured	_____

b **Using your notes, write a summary of the events. Then work in pairs and swap summaries with your partner. Check that your partner's summary is clear and easy to understand and that no important information is missing.**

c **Pilots → p148** **ATCOs → p158** **Work together to manage a fire emergency.**

ATCO *Hijet 451, taxi via outer taxiway to Stand 17.*
Pilot *(readback) Outer taxiway, Stand 17, Hijet 451*

Putting it together: Responding to situations

Preparation

21a **Describe an action in progress using the cues below and a verb ending in *-ing*. Make sure that you pronounce the ending clearly.**

Cues

Approach Taxiway D	Follow the A320
Shut down Engine 2	Visibility decrease
Vacate RWY 28L	Fire spread
Wait tanker Stand 19	Pax evacuate
Hold short RWY 04	Fire service come
Try repair VHF	Light flash

A *We are approaching Taxiway Delta.*

ICAO FOCUS

Here are some of the tasks listed in the *Manual on the Implementation of ICAO Language Proficiency Requirements* under the title 'Sharing Information'.

- Describe a state
- Describe a procedure
- Describe a changed state
- Describe aims/precautions
- Describe an action in progress
- Describe the source of a problem
- Describe a process
- Describe a visual impression

In pairs, give examples of each of these communicative tasks from your operational experience. Then compare with the class.

b **Describe a state or a changed state using the cues below and a verb ending in *-ed*.**

Cues

Vacate RWY 15R	Extinguish fire	Discharge fire agent	De-ice wings
Release brakes	Increase foam rate	Disconnect tow-bar	Load cargo hold
Complete evacuation	Cross Taxiway H	Replace pump	Inflate MLG tyre

A *Runway 15 Right is / has been vacated.*

Communication

22 **1.39 Listen to transmissions from pilots and ATCOs giving information about eight ongoing situations. For each situation make an appropriate response.**

Pilot *Apron Control, Iberia 287, we have been waiting ten minutes now for Stand Bravo 18 to be vacated. Have you got an update?*
A (ATCO) *Iberia 287, the 767 on your stand had a tyre change. They will be pushing back in five minutes.*

ATCO *There is still some smoke coming out of the engine on your left-hand side. Advise intentions.*
A (Pilot) *We will disembark the passengers from the right-hand side.*

23 **Pilots → p148** **ATCOs → p158** **Take turns to manage the pushback and taxi of Air New Zealand 415 from Stand C21. The runway in use is 36 Right. The pilot will initiate the conversation.**

Pilot *Air New Zealand 451, request push-back and start-up.*
ATCO *Air New Zealand 451, departures on hold due Runway 29L closed.*

Debriefing

24 **Report back to the class about the different stages and types of communication in the role play. How effective, clear and fluent were your interactions?**

Progress check

1 Complete the progress check for this unit. Assess your proficiency in these areas.
(1 = I need more work on this, 5 = I feel confident in this area)

- I can talk about turnaround activities in English. 1 2 3 4 5
- I am familiar with the names of ground equipment and services. 1 2 3 4 5
- I can recognise descriptions of events on the ground. 1 2 3 4 5
- I can describe and report anomalies. 1 2 3 4 5
- I can describe what I see, hear, feel and smell. 1 2 3 4 5
- I can ask for clarification and more precise information. 1 2 3 4 5
- I can use my voice to distinguish between statements and questions and focus attention on key information. 1 2 3 4 5
- I can describe ongoing actions. 1 2 3 4 5
- I can describe completed actions. 1 2 3 4 5
- I can respond to and manage abnormal situations on the ground. 1 2 3 4 5

2 Choose three areas of communication from this unit which you are less confident in. Make plans for improving your skills in these three areas.

UNIT 4
Runway incursions

COMMUNICATION FUNCTIONS

- Call signs
- Readback
- Communication errors: failure to seek confirmation
- Dealing with garbled messages
- Reporting past actions
- From phraseology to plain language
- Conditional clearances

Lead in

> "Taxiway or runway confusion events are the precursors of runway incursions and, potentially, of ground collisions between two aircraft or between an aircraft and an airport vehicle or construction equipment."
>
> Michel Trémaud, *Erasing Confusion,* in FSF *AeroSafety World*, May 2010

1a The bad state of airport signs, missing aerodrome information and stress in the workplace are all potential precursors of incidents or accidents. What other small signs or events may indicate to you that an incident or accident is 'waiting to happen'? How would you respond to each one?

b What do you think the colour-coding in this diagram represents?

Understanding runway incursions

Contributory and causal factors

- Controllers – more than one position
- Inadequate driver training
- Complex instructions to different aircraft
- Controller high speech rate
- Crew not familiar with the airport
- RT – two different languages
- Deficiencies in markings, signage and lighting
- Multiple runway operations – closely spaced parallel runways
- Frequency congestion / blocked frequency
- Controller non-standard phraseology
- Misapplied conditional clearance

c In your opinion, what conclusions can be drawn from this diagram?

d Explain one of these causal factors and give a practical example of it from your own experience.

Confusion

ICAO FOCUS

> "The report did not specify how the controller pronounced the call sign, but said that it was not "niner-seven-niner" and noted that 71 and 79 are similar."
>
> *Two's too many,* Flight Safety Foundation *AeroSafety World,* August 2008

What cases of number confusion have you encountered?

2a **1.40** Which call sign do you hear? Choose the correct answers.

1	a 171	b 979	c 179
2	a 425	b 429	c 494
3	a 686	b 868	c 668
4	a 6939	b 6393	c 6339
5	a 4213	b 2413	c 4321
6	a 5779	b 5797	c 9579
7	a 4081	b 4031	c 4051
8	a 7951	b 5791	c 7195
9	a 6338	b 6388	c 6833
10	a 1255	b 1295	c 5129

b **1.40** Listen to the call signs again. Then work in pairs and take turns to repeat them. Tell your partner if they are not saying them clearly.

3a **1.41** Listen to ten ATC instructions and read them back.

ATCO *Finnair 482, line up Runway 21 Left, intersection Charlie.*
A (Pilot) *Lining up, Runway 21 Left, intersection Charlie, Finnair 482.*

b It is not only call signs which can be confused. In pairs, make a list of other items used in RTF which can also be confused. Give an example in each case.

A *Taxiways: Bravo 7 / Bravo 9*

c Take turns to practise saying your examples. Use good pronunciation and delivery so that they can be distinguished clearly.

Precursors

4 Match the safety-related words and phrases (1–8) to their synonyms or definitions (a–h).

1 lack	a not knowing about something
2 overlooked	b delivering, giving
3 expectation bias	c not succeeding to achieve something
4 unawareness	d absence
5 obscured	e to say aloud
6 failure	f neglected, forgotten, disregarded
7 to verbalise	g thinking you know what will happen
8 issuing	h hidden, concealed

5a **In pairs, put the precursors (a–q) into the correct categories in the table below.**

a lack of readback
b ATIS message received, but relevant information overlooked
c lack of oversight of taxiing aircraft
d expectation bias at a familiar airport
e not asking for confirmation of instructions from ATC
f misleading taxiway signage
g current airport diagrams not showing the actual airport configuration
h NOTAM prepared, but not issued, or addressed incorrectly
i controller's hearback was ineffective
j inadequate taxi briefing
k a non-standard taxi route
l markings obscured by wear or patches of snow
m failure to verbalise crew actions, instructions and clearances
n taxiway lighting brighter than runway lighting
o issuing take-off clearance without confirming the aircraft's position
p changeover of function from pilot not flying to pilot flying just before line-up
q uncertainty whether ATC instruction is directed to the correct aircraft

flight crew	ATC	airport infrastructure
ATIS message received, but relevant information overlooked		

b **1.42 Listen to six pilot comments. For each comment say which precursor is involved.**

Pilot *Was that clearance meant for us? We haven't even reached the holding point yet.*
q – uncertainty whether ATC instruction is directed to the correct aircraft

c **1.42 Listen again and respond to each comment. Remember to include call sign, taxiway and runway data.**

Pilot *Was that clearance meant for us? We haven't even reached the holding point yet.*
A (Pilot) *Tower, Speedbird 5831, was that take-off clearance meant for us?*

6 **In groups, discuss what effects the precursors in Exercise 5a could have.**

7a **The Flight Safety Foundation (FSF) ALAR Tool Kit gives many best practices to reduce confusion. In pairs, identify which precursors in Exercise 5a the safety measures (1–6) below address and how they enhance safety.**

1 When taxi instructions are received, both pilots should refer again to the airport diagram and verbalise agreement about the assigned runway and taxi route.
2 The taxi and hold-short instructions should be hard copied as a memory aid and for reference.
3 If any doubt exists about the taxi route, progressive taxi instructions should be requested.
4 Operator Standard Operating Procedures should contain best practices to enhance situational awareness.
5 Runway centreline lighting should conform to pilot expectations for the take-off runway.
6 Before initiating the take-off roll, the flight crew should verbalise the line-up check a final time by performing a standard challenge-response call, e.g. 'Active runway check – Active runway checked'.

1 Referring to airport diagram and verbalising agreement about routeing: d expectation bias; g non-updated diagrams; j inadequate taxi briefing; k non-standard taxi route; m failure to verbalise.

b **As pilots, which of these practices do you follow? As controllers, do you agree with the need for such checks?**

8 **Pilots → p149** **ATCOs → p158** **Take turns to make requests for information, confirmation or clarification.**

Pilot *Iberia 7455, we are at the end of Taxiway Echo heading north. The painted markings to the taxiways to the left and right are not clear. Can you assist us, please?*

ATCO *Iberia 7455, Golf 3 is to the left and Golf 4 to the right. Turn right and taxi on Taxiway Golf 4. Hold short of Runway 27 Right.*

Communication errors: Failure to seek confirmation

9 **1.43** **Student A → p132** **Student B → p140**
In pairs, listen to the pilot and ATC transmissions. They are clipped, garbled, unclear, interrupted or incomplete. Take turns to ask for confirmation. Your partner will say the message again. Read it back to confirm that you have understood fully.

ATCO *Taxi to holding point* Echo 2 Runway 28 Left via Taxiways ...*

A *Part of your transmission was garbled/ clipped/inaudible/missing. Say again / Say again taxiways.*

B *Taxi to holding point Echo 2 Runway 28 Left via Taxiways Lima and Hotel.*

A *Taxi to holding point Echo 2 Runway 28 Left via Taxiways Lima and Hotel.*

ICAO FOCUS

"Misunderstandings may involve half-heard words or guessed-at numbers."

Flight Safety Foundation *ALAR Briefing Note 2.3: Pilot-Controller Communication*

- **What are the various reasons for which a word may be half heard?**
- **When people guess in these situations, what do you think they base their guess on?**
- **What should be your response in these situations?**

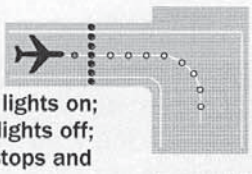
***NOTE:** *holding point* is not standard ICAO terminology, but was widely adopted by States to avoid confusion with the U.S. phraseology *Taxi into position and hold*. Since September 2010, the U.S. has adopted the standard ICAO phraseology *Line up and wait*.

Good practice

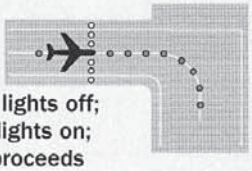
10a **Each of the recommendations below is taken from Section 4.5 of ICAO Doc. 9870, *Manual on the Prevention of Runway Incursions*. Select the three factors which you think have the most positive impact on flight crew.**

ATC recommendations:

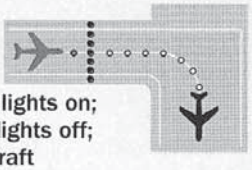
- Always use a clear and unambiguous method on the operating console to indicate that a runway is temporarily obstructed.
- Whenever practical, give ATC en-route clearance prior to taxi.
- Always switch on stop bars to indicate that all traffic shall stop. Switch off to indicate that traffic may proceed.
- Never instruct aircraft or vehicles to cross illuminated red stop bars when entering or crossing a runway.
- Develop and utilise standard taxi routes to minimise the potential for pilot confusion.
- Where applicable, use progressive taxi instructions to reduce pilot workload.
- Never issue line-up clearance to an aircraft if this aircraft will be required to hold on the runway for more than 90 seconds beyond the time it would normally be expected to depart.
- When using multiple or intersection runways, do not use oblique or angled taxiways.



Stop bar lights on; Lead-on lights off; Aircraft stops and holds



Stop bar lights off; Lead-on lights on; Aircraft proceeds



Stop bar lights on; Lead-on lights off; Next aircraft stops and holds

b **In pairs, discuss your choice of three factors. Then report back to the class.**

11 **Match the words used in the ICAO recommendations to the meanings (1–8).**

a operating console	b unambiguous
c obstructed	d oblique
e stop bars	f progressive
g confusion	h intersection

1 step by step
2 lights indicating that access to a runway is prohibited
3 state of uncertainty
4 which cannot be misunderstood
5 at an angle which is more than 90 degrees
6 where taxiways and runways cross each other
7 an ATCO's work station *operating console*
8 blocked

LANGUAGE FOCUS: Modal verbs

Although not used in standard phraseology, modal verbs are used when plain language is required in more extended exchanges.

*We **can** see some debris on the side of the taxiway.*
*The passengers **cannot** board until the cabin has been inspected.*
*Flights **may** be delayed if visibility decreases.*
*We **could** exceed our regulation duty time if we are delayed much longer.*
*We have a sick passenger and **must** return to the gate.*
*You **must not** cross an active runway until instructed to do so.*
*Switch on stop bars to indicate that all traffic **shall** stop.*
*ATC **should** give ATC en-route clearance prior to taxi.*
*If the visibility decreases any more, the airport **will** be closed.*

12a **1.44 Listen to eight transmissions. Use the data in the box below and a modal verb to respond appropriately.**

1 switch over to the standby power supply	5 Yes, see them
2 All flights delayed	6 All traffic use November and Papa
3 flights delayed?	7 with them in 90 seconds
4 use your glasses	8 on time tomorrow

ATCO *The main generator has failed.*
A *We must switch over to the standby power supply.*

b **1.45 Listen to the transmissions and the responses and repeat the responses.**

13a **1.46 Listen to eight transmissions about airport incidents. Use the airport chart to take notes about the location (a–h), the aircraft or vehicle involved and further details in each of the scenarios.**

	Location	Aircraft / Vehicle	Details of incident
1	*e (RWY 09 / TWY N4)*	*Dash 8 / A319*	*Dash 8 leaving holding point N4; A319 lined up RWY 09 from N5*

b **Use your notes to give instructions to the aircraft/ vehicles involved. Then report these runway incursion incidents to your supervisor or to Flight Ops.**

A (instruction)
Dash 8, stop immediately.
Dash 8: stop immediately – traffic on active runway.
A (report)
A Dash 8 started entering Runway 09 from Taxiway N5 while an A319 was already lined up.

Low-visibility operations

LANGUAGE FOCUS: Passive (past tense)

In the report on the Milan Linate runway incursion you will find sentences in both active and passive modes.

Active	Passive
*The aerodrome **operated** formally under Category III.*	*Both English and Italian languages **were used.***
*The Ground Controller **gave** start-up clearance.*	*Flight 686 **was cleared** to taxi to Runway 36R.*
*The pilot **advanced** the throttles and **acknowledged** the clearance.*	

14 Discuss in groups. In your experience, what are the effects of using more than one language on the frequency?

15a Read about what happened during this runway incursion at Milan Linate airport. What were the causes of the accident which followed?

Runway incursion, Milan, Linate, 2001

At the time of the accident, the visibility at the airport ranged from 50 to 100 metres. The Runway Visual Range (RVR) for Runway 36R was about 200 metres with a registered minimum value of 175 metres. The aerodrome operated formally under Category III from time 05:24. During the time interval from 05:10:47 to 06:10:21 UTC (accident time), controllers had assisted 24 aircraft: 21 that taxied out from North Apron and West Apron and three more aircraft that had landed. Both English and Italian languages were used during these communications.

from the Final Report by the *Agenzia Nazionale per la Sicurezza del Volo*

It was a foggy morning in Milan and one of the passenger flights parked on the North apron was an SAS MD-87 being prepared for Flight SK686 to Copenhagen.

At 07:54 (local time), Flight 686 was cleared to taxi to runway 36R: 'Scandinavian 686 taxi to the holding position Cat III, QNH 1013 and please call me back entering the main taxiway.'

A few minutes later, a Cessna pilot on a flight to Paris requested permission to start engines. The ground controller gave start-up clearance and then requested Flight 686 to contact the Tower controller. From this moment on, the crew of the MD-87 and the crew of the Cessna were tuned to two different radio frequencies.

At 08:05 the pilots of the Cessna received taxi clearance: 'Delta Victor X-ray, taxi north via Romeo 5, QNH 1013, call me back at the stop bar of the ... main runway extension.'

The pilot acknowledged by saying: 'Roger via Romeo 5 and ... 1013, and call you back before reaching main runway.'

The Cessna started to taxi from the General Aviation parking position, following the yellow taxi line. After reaching the position where the yellow taxi line splits into two diverging directions, the pilot erroneously took the taxi line to the right and entered Taxiway Romeo 6.

At 08:09 the Ground Controller cleared the Cessna to continue its taxi on the North apron. At the same time the Tower controller cleared the MD-87 for take-off: '... Scandinavian 686 Linate, clear for take-off 36, the wind is calm, report rolling, when airborne squawk ident.'

The pilot advanced the throttles and acknowledged the clearance. When the MD-87 was speeding down the runway, the Cessna crossed the runway holding sign and entered the active runway 18L/36R.

At 08:10:21, the nose landing gear of the MD-87 left the ground at an airspeed of 146 knots and the MD-87 crew probably saw the Cessna through the fog and reacted with additional large nose-up elevator, but the MD-87 collided with the Cessna.

From the *FSF Aviation Safety Network*

b **In pairs, answer these questions about the text.**

1 RVR 200 metres was the _____ value during the time preceding the accident.
a minimum b approximate c maximum
2 The accident occurred at _____.
a 06:10 local time b 08:10 UTC c 06:10 UTC
3 Flight 686 was flying to _____.
a Stockholm b Paris c Copenhagen
4 At the time of the accident the MD-87 was tuned to the _____ frequency.
a Tower b Ground c Departures
5 The Cessna pilot should have taken Taxiway Romeo _____.
a 4 b 5 c 6
6 The controller requested that the pilot of Flight 686 report when _____.
a rolling and squawk when airborne b lined up c airborne
7 The Cessna _____ the active runway.
a crossed b vacated c entered
8 When the MD-87 pilot saw the Cessna, he _____.
a retracted the gear b pulled on the control column c increased thrust

c **Make a list of all the precursors and causal factors which contributed to this accident.**

d **Report the events in your own words stage by stage.**

e **Make a list of the different ways in which this accident could have been avoided.**

The accident could have been avoided if ...
1 the Cessna pilot had followed Taxiway R 5.

ICAO FOCUS

*"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 of runway operations.*
The procedure words **roger** *and* **wilco** *are* ***insufficient*** *acknowledgement of instructions.*
Conditional clearances must consist of the condition before the line-up instruction, and an acknowledgement of the correct (or otherwise) readback is required as part of the correct procedure.
For example:
ATCO: SAS941, BEHIND DC9 ON SHORT FINAL, LINE UP BEHIND
Pilot: BEHIND LANDING DC9 ON SHORT FINAL, LINING UP BEHIND, SAS941"

Communications Best Practice, **Appendix A, ICAO Doc. 9870**

- **Give examples of full and abbreviated call signs.**
- **Why is it important to use full call signs?**
- **Why can *roger* and *wilco* be confusing?**
- **Explain what a conditional clearance is.**

16 **Student A → p132** **Student B → p140** **Take turns to transmit information, conditional clearances or taxi instructions. Your partner will confirm or read back what they have understood. Correct your partner if necessary.**

B *2nd right / T4 / Ground 121.9*
A *Turn second right onto Taxiway Tango 4, contact Ground 121 decimal niner*

Sterile cockpit

17a **1.47 Read this list of events which can result in distraction, taken from the Eurocontrol *Preventing runway incursions* training aid. Then listen to eight communications and identify which event or circumstance (a–h) is involved.**

a checklist worked through out of sequence
b time pressures to make departure slot
c noise level on flight deck resulting in missed call from ATC
d changes in clearances and issue of non-standard clearances
1 e communication saturation
f use of non-aviation English
g use of multiple languages on the frequency
h use of non-ICAO standard phraseology

b **Select one of the events (a–h). In your own words, explain it to the class. Try and give an example from your own experience, describing the circumstances.**

ICAO FOCUS

"Things pilots have done:
- *went through a red stop bar*
- *took a wrong turn on the taxiway*
- *entered an active runway without clearance*
- *took off or landed without clearance*

Often a contributing factor was attention diverted to a less essential task."

Preventing runway incursions, Eurocontrol 2008

- Make a list of tasks or events which could distract the flight crew.
- Make a list of tasks or events which could distract air traffic controllers.
- Which are more likely to be distracted, pilots or controllers? Why?

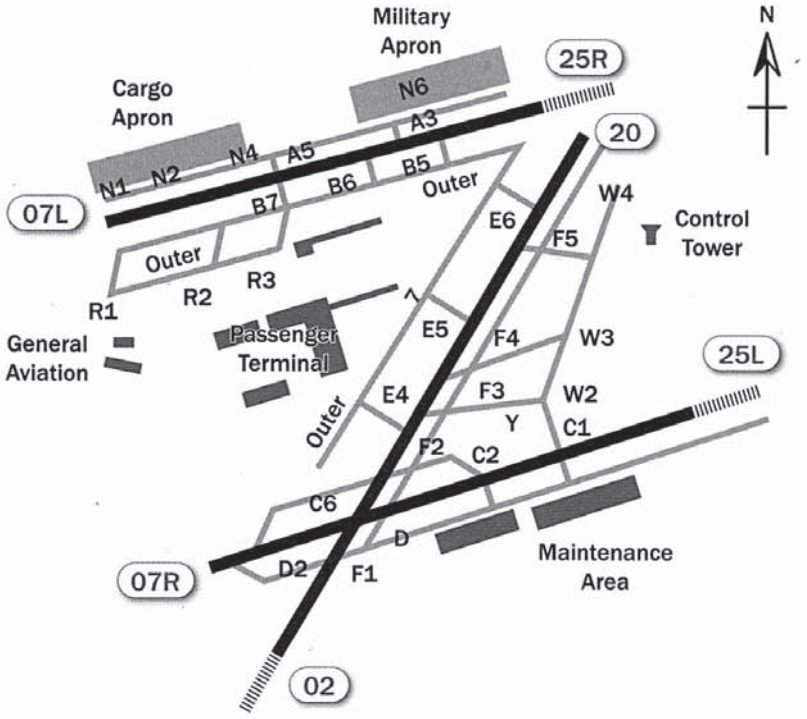
18a **Work in pairs. Take turns to use the airport diagram to help your partner find the location of different points in the aerodrome.**

A *Where is Taxiway November 1?*
B *Taxiway November 1 is just north of the threshold of Runway 07 Left.*

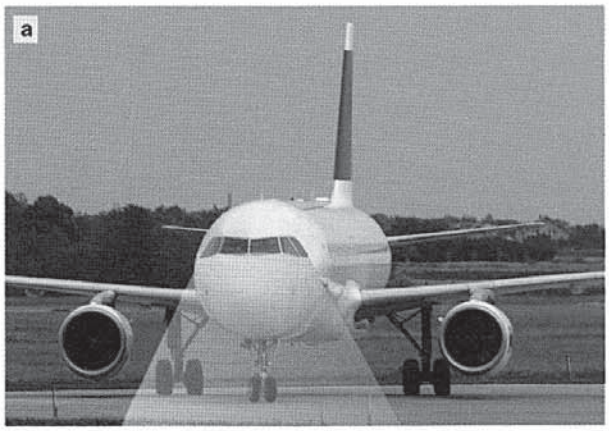
b **Student A → p133** **Student B → p140**

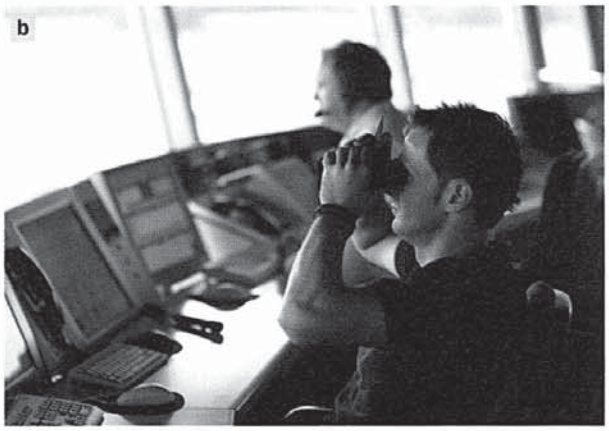
Use the airport diagram and take turns to describe how and when the plane taxied to the runway in use. Your partner will take notes and make sure they have understood.

A *At 16:08 we/they requested approval for pushback and start-up.*



Putting it together: Situational awareness





19a **What do these pictures tell you about situational awareness for pilots and ATCOs?**

b **In pairs, brainstorm ways of obtaining situational awareness on the ground.**

c **What are the advantages and limitations of each way?**

Preparation

20a **1.48 Describe how and why different aviation technologies are used. Then listen and check.**

1 Controllers / surface movement radar / monitor / traffic on the ground
Controllers use surface movement radar to monitor traffic on the ground.

2 Pilots / 121.9 / contact / Ground Control
3 Controllers / call signs / identify / individual aircraft
4 Pilots / all their senses / create / situational awareness
5 Inertial navigation / laser gyros / calculate / aircraft position
6 Controllers / electronic flight strips / manage / separation and flow of traffic
7 Controllers / binoculars / follow / aircraft movements visually
8 Pilots and controllers / VHF / communicate / with each other

b **1.48 Listen again. Then practise saying the sentences. Pay attention to pronunciation, phrasing and fluency.**

c **In pairs, prepare a description of how all the different sources of audio, visual and other sensory input are used together by pilots and controllers to create and maintain situational awareness on the ground.**

Pilots
Ground, Tower and Departures frequencies, hand signals, markings and signs etc.
ATCOs
All ATC frequencies, other colleagues, ground radar, visual observation etc.

21a **1.49 Listen to eight transmissions and, in each case, identify the situation and its immediate consequences. Take notes.**

aircraft landing gear fire / TWY N blocked

b **In pairs, compare your notes. Did your partner note down anything you missed?**

Communication

22 **Pilots → p149** **ATCOs → p159** **Take turns to use plain English to explain why you are unable to comply with ATC instructions or pilot requests. Your partner will reply to your explanation if/where appropriate.**

Instructions

ATCO *Singapore 977, taxi to holding point C2 Runway 27L via G and C. Hold short of 27L.*
Pilot *Unable. Our Number 4 engine N2 is fluctuating. We have requested Engineering and are remaining on the apron, Singapore 977.*
ATCO *Singapore 977, advise us of the situation.*

Requests

Pilot *Jamaica 496, requesting nose-in stand due full load, adverse weather and late arrival*
ATCO *Jamaica 496, unable. Sorry. All nose-in stands are currently occupied. Taxi to Mike 24*
Pilot *Taxiing to Mike 24.*

Debriefing

23 **Were you satisfied with your performance changing from phraseology to plain English and explaining why you were unable to comply? Discuss those areas which you found most challenging.**

Progress check

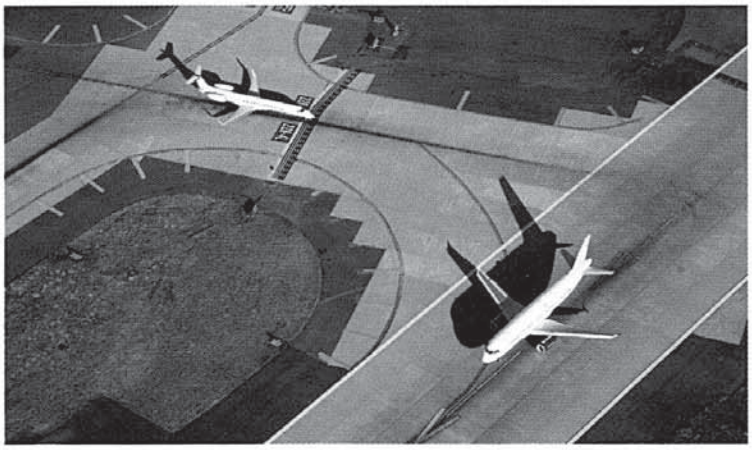
1 Complete the progress check for this unit. Assess your proficiency in these areas.
(1 = I need more work on this, 5 = I feel confident in this area)

■ I can recognise and say call signs	1 2 3 4 5
■ I can request and give information	1 2 3 4 5
■ I can understand and explain safety recommendations	1 2 3 4 5
■ I can recognise and use phrasing and stress in English	1 2 3 4 5
■ I can take notes	1 2 3 4 5
■ I can report an incident	1 2 3 4 5
■ I can give and read back taxi instructions and conditional clearances	1 2 3 4 5
■ I can report on an incident	1 2 3 4 5
■ I can move from standard phraseology to plain language	1 2 3 4 5
■ I can explain why I am unable to comply	1 2 3 4 5

2 Choose three areas of communication from this unit which you are less confident in. Make plans for improving your skills in these three areas.

DVD Unit 4

When attention is diverted



24a **Watch the Eurocontrol clip *When attention is diverted* (0.00 – 2.41) and answer the questions.**

1 How many aircraft are involved?
2 In what flight phases are the aircraft?

b **Watch the clip again and take notes about the errors which lead to the runway incursion.**

c **Work in pairs. Compare your notes with your partner. Do you agree about the errors?**

25 **Report this incident either as a pilot, in the form of a debriefing, or as a controller, in the form of a report to your supervisor.**

26a **Watch the Eurocontrol clip *Fog and poor procedures* (2.42 – 4.11) and answer the questions.**

1 Where are the men working?
2 What do they decide to do?
3 What happens as a result?

b **Discuss with a partner the contributing factors to this incident. How could it have been avoided?**

27a **Watch the Eurocontrol clip *40 seconds* (4.12 – 5.56). In pairs, describe what happens in your own words and discuss what you think is the cause of the incident.**

b **Number these transmissions in the correct order with your partner.**

___ C-Jet 333, wind 170 degrees, seven knots, runway 15L, cleared to land
___ Continue approach Runway 15L, C-Jet 333
1 C-Jet 333, continue approach, Runway 15L, Number 1
___ Behind landing Runway 15L, lining up and wait behind, B-Jet 110
___ Holding at intersection A3 for Runway 15L, B-Jet 110
___ Checklist completed. Cleared to land, Runway 15L, C-Jet 333
7 A-Jet 234, Runway 15L, cleared for take-off
___ B-Jet 110, taxi to and hold at intersection A3 for Runway 15L
___ Cleared for take-off, Runway 15L, A-Jet 234
13 What's that? Right! Go right!
___ B-Jet 110, behind landing 15L, line up and wait behind
___ OK, that's our landing. Lining up.
___ OK, thank you. Checklist completed.

c **Watch the clip again and check your answers.**

d **Identify the different errors which were made.**

28 **Make a list of all the errors which were made in these three clips. Have you encountered similar errors?**

PART A REVIEW
Ground movements

Pronunciation

1a **1.50 Listen to each sentence and underline the word you hear.**

1 light / right	5 again / against	9 then / than	13 tired / tyre	17 fuel / full
2 chart / cart	6 services / surfaces	10 way / away	14 quite / quiet	18 lose / loose
3 won't / want	7 hand / land	11 near / rear	15 steel / still	19 feel / fill
4 low / load	8 least / last	12 wheel / will	16 fly / flight	20 clear / clean

b **1.51 Listen and repeat the pairs of words.**

c **1.52 Listen to the sentences and underline the words with the most stress.**

1 The rear hold door is open.
2 We'll need a marshaller to guide us into the stand.
3 Push back to face east.
4 We will require towing.
5 We can see a large flock of seagulls near the threshold.
6 There's a dog on the runway.
7 We can smell a strong odour.
8 We have a passenger on board complaining of stomach pains.
9 Do you require assistance?
10 There's a large oil spillage on the apron.

d **1.52 Listen again and repeat the sentences with the same stress.**

Structure

2a **Complete the sentences with these words.**

in at on out of to down onto ahead behind back

1 There is still some smoke coming _____ the engine.
2 There is some debris _____ the runway.
3 We will continue to cool _____ the engine.
4 We should be ready for departure _____ 15 minutes.
5 The crew is _____ schedule and in a hurry to take off.
6 I estimate our delay _____ approximately 30 minutes.
7 We cannot push _____ yet.
8 Requesting detailed taxi instructions _____ Runway 13L.
9 There is a Boeing 787 stopped _____ of us on Taxiway November.
10 Turn right _____ Taxiway Tango 4.

b **Complete the sentences with the verbs in the box.**

felt smell heard looks see appears noticed don't think

1 We _____ a loud bang.
2 We can _____ the stop-bar lights.
3 We _____ a series of strong vibrations.
4 It _____ as if the door is not locked.
5 Can't you _____ something burning?
6 The 757 _____ to have skidded off the runway.
7 I _____ there is any damage.
8 We _____ some debris on the side of the runway as we were turning onto Taxiway D.

c **Complete the sentences with the correct form of the verb.**

1 The RVR for Runway 36R _____ about 200 metres.
a is b are c has
2 Do you think he _____ our request?
a understand b understood c is understanding
3 Report _____.
a vacating b vacate c vacated
4 The fire engines _____ with you in 60 seconds.
a will be b are c have been
5 There is a Dash 8 _____ holding point N4.
a left b leaves c leaving
6 We _____ ice patches near the intersection of C and G.
a encountered b encounter c encountering
7 We _____ the fire.
a have extinguish b have extinguished c extinguish
8 We _____ for a disabled passenger to arrive, but will be on our way soon.
a wait b are waiting c waited
9 We are unable _____ our 45 slot.
a making b make c to make
10 Some of the bags _____.
a are missing b are missed c have missed

Vocabulary

3a **O1.53 Listen to ten pilot and controller transmissions. Identify the airport equipment they are referring to but do not actually mention by name.**

	chocks		jetway		follow-me car		fire engine		crew minibus
	conveyor belt loader		stop bar		tow-bar		GPU		visual docking guidance system

b **Complete the sentences about problems with the words in the box.**

congested leaking deflated delayed bogged down missing overflowing dented

1 The flight came through an electric storm and there are several static dischargers _____.
2 The apron is very _____ today and we have to send several aircraft to outlying stands.
3 The hydraulic union was _____ and the mechanic is changing the seal.
4 Due to the maintenance work, the flight will be _____ 30 minutes.
5 Taxiway B3 is closed while they are recovering the B767 which is _____ on the grass.
6 The hail storm has caused the wing leading edges to be quite _____.
7 The automatic shut-off failed to operate and the fuel is _____.
8 I asked the technicians to change a main gear wheel as one of the tyres looked _____.

c **1.54** **Listen to eight pilot statements. Who do they need?**

	flight attendant		ground handler		dispatcher		police
	paramedic		aircraft engineer		tug driver		passenger service agent

Fluency

4a **1.55** **Listen and ask an appropriate question to obtain more information or clarification. Pay attention to your fluency and delivery.**

b **Pilots → p150** **ATCOs → p159** **Take turns to give information and ask for clarification.**

Comprehension

5a **1.56** **Listen to the report of a runway incursion in the USA and take notes.**

1 aircraft type being towed		6 tractor authorised?	
2 destination of tow		7 position on runway when take-off rejected	
3 tractor's taxi route		8 maximum aircraft speed	
4 departing aircraft type		9 shortest distance between aircraft	
5 runway in use		10 B767 exited via	

b **1.57** **Listen to another report of a runway incursion in the USA and take notes.**

1 first landing aircraft type		6 first instructions to crew	
2 flying from		7 communication problems	
3 arrival time		8 departure aircraft	
4 landing runway		9 departure runway	
5 airport		10 final distance between two aircraft	

Interaction

6a **Report one of the runway incursion incidents you listened to in Exercises 5a and 5b to a partner and make notes on the precursors and causal factors.**

b **Pilots → p150** **ATCOs → p159** **You have chronological cues for a departure. Prepare and perform the departure and taxiing scenario together.**

Pilot *Tower, Alitalia 3845, request pushback and start-up approval for departure to Rome, Alitalia 3845.*

ATCO *Alitalia 3845, unable for the moment. There is approximately a 15-minute delay on all departures due traffic and Runway 18 Right closed.*

UNIT 5
Environmental threats

COMMUNICATION FUNCTIONS

- Communicating weather information
- Communication errors: expectation bias (1)
- Correcting
- Describing a flight path
- Reading back and confirming
- Clarifying and rephrasing
- Using coded/numerical sources
- Saying why you are unable to do something

Lead in

> **The flight crew had the sensation of being pushed down and sideways as the co-pilot began flaring the aircraft for landing at Australia's Sydney Airport. The co-pilot increased pitch attitude and thrust, but the high sink rate continued until the Boeing 747-400 touched down hard on the runway.**
>
> Mark Lacagnina, *Escape from a Microburst*, Flight Safety Foundation *AeroSafety World*, April 2010

1a **Answer these questions.**

1 During which flight phase are the described events occurring?
2 Explain what *flare*, *pitch attitude*, and *sink rate* mean.
3 Why must pilots and controllers have frequently updated weather reports? What information do these reports need to contain?
4 What different sources of weather information do you use?
5 What sudden changes in weather have you experienced?

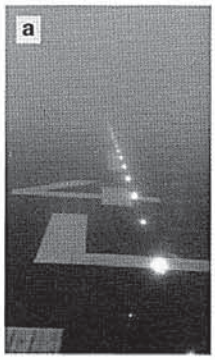
b **In pairs, make lists of these things. Then compare your lists with another pair.**

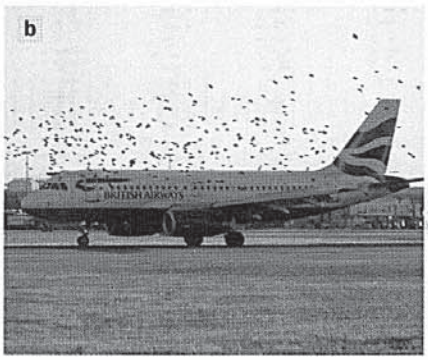
1 types of precipitation, e.g. rain
2 wind-related phenomena, e.g. crosswind
3 obscuration, e.g. fog
4 environmental phenomena which are not weather-related, e.g. bird strikes

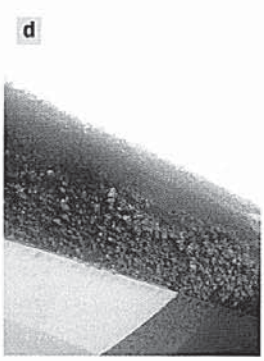
Environmental phenomena

2a **Match the environmental phenomena to the pictures (a–j).**

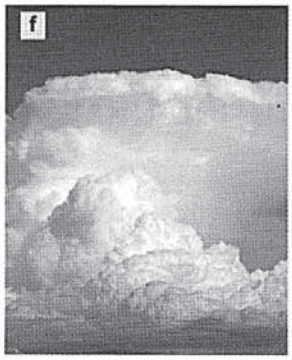
bird strike crosswind cumulonimbus fog ice build-up lightning strike rain standing water volcanic ash wake turbulence







fog



b **In pairs, discuss in what ways each phenomenon may be dangerous. Decide on precautionary measures, as pilot or controller, to avoid or reduce the consequences of each phenomenon.**

3a **2.01 Listen to eight ATC transmissions and identify the environmental conditions they are referring to.**

drifting snow drizzle glare *1* gusts hail low ceiling smoke windshear

b **Choose the correct adjective for each noun.**

1 thick / heavy / severe	smoke	6 high / bright / weak	glare
2 bright / scattered / hard	cloud	7 poor / short / light	visibility
3 overcast / low / heavy	rain	8 drifting / strong / heavy	wind
4 deep / thin / severe	turbulence	9 weak / scattered / high	showers
5 high / deep / long	standing water	10 thick / few / strong	fog

c **2.02 Listen and check your answers. Then repeat the phrases.**

4 **Pilots Prepare a pilot report (PIREP) to advise ATCOs and other pilots of a significant weather phenomenon. ATCOs Prepare transmissions to advise pilots of the presence, location and seriousness of four of the phenomena in Exercise 3a.**

Pilot *Lufthansa 3675 reporting strong gusting crosswinds during flare and touchdown on Runway 31 Left.*

ATCO *Be advised that incoming flights have experienced strong gusting crosswinds near the threshold of Runway 31 Left.*

Communicating weather information: METAR, TAF and ATIS

5a **In pairs, complete this table of meteorological abbreviations used in METARs (Meteorological Airport Reports) and TAFs (Terminal Aerodrome Forecasts). Match the abbreviations in the box with the correct words.**

BCFG BR DRSN DU DZ FU FZRA GR HZ IC MIBR RA RASH SCT SN SQ TS VA

1	rain	7	hail (from French *grêle*)	13	scattered
2	dust	8	squall	14 *BCFG*	fog patches
3	drizzle	9	ice	15	drifting snow
4	snow	10	volcanic ash	16	freezing rain
5	haze	11	thunderstorm	17	rain showers
6	mist (from French *brûme*)	12	smoke (from French *fumée*)	18	shallow mist (from French *mince*)

b **2.03 Listen to two METARs and one TAF report and complete the missing information below. What are the differences in layout and units used between the American and European reports?**

1 METAR KBUF (Buffalo Niagara International) 12 *1755* Z AUTO *210* 16G *24* KT *180* V240 1SM R_____/P_____ft – _____ BR BKN_____ OVC025 _____/04 A_____.

2 METAR EPKK (Krakow) 06_____ 120 _____ 1400 R _____/P_____N +SN _____017 M04/_____ Q_____ NOSIG

3 TAF SBRF_____ 070801Z 210_____KT 9999 BKN_____RA BKN008 TEMPO 0712/0718 _____015=

c **2.04 Listen to and repeat five METAR and two TAF reports. Then summarise them.**

6a **Prepare an updated weather report in plain English about a location which you know.**

b **Work in pairs. Read your weather report to your partner. Your partner will take notes and then check that they have understood correctly. Then change roles.**

7a **2.05 Listen to two ATIS (Automatic Terminal Information Service) transmissions and complete the tables below.**

ATIS 1

Airport		Visibility	
Information		Cloud	
Time		Temperature	
Departure RWY		Dew point	
Wind velocity		QNH	

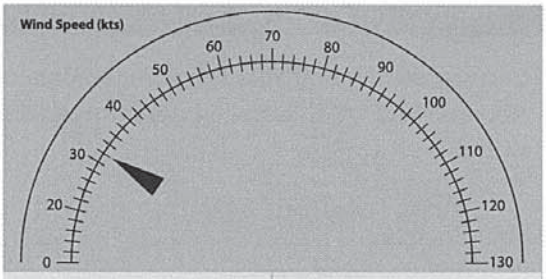
ATIS 2

Airport		Visibility	
Information		Precipitation	
Time		Ceiling	
ILS RWY		Temperature	
RWY condition		Dew point	
Transition level		QNH	
Runways closed		Special instructions	
Wind velocity			

b In what order is ATIS information usually given? What information is mandatory? What information may be optional? Why is this information so critical for both pilots and controllers?

c **Student A → p133** **Student B → p141** Take turns to give an actual updated weather report. Use the blank table to take notes.

d Cross-check your notes verbally with your partner.



Surface Wind	110° 20 Kts
CrossWind R20	20
Temperature	12
Dew Point	10
QNH	1001
Visibility	5000
Present Weather	HZ
Designator - A	Hotel
Designator - D	Golf

LANGUAGE FOCUS: Changing conditions

*The wind is **strengthening/increasing** (+) / **weakening/decreasing** (–) to eight knots.*
*The wind is **veering** (clockwise) / **backing** (counter-clockwise) to the north-east.*
*The wind is **gusting** (+) to 24 knots.*
*The temperature is **increasing/rising** (+) / **decreasing/dropping/falling** (–) to 15°.*
*The fog is **thickening** (+) / **lifting** (–).*
*The precipitation is **intensifying** (+) / **lessening** (–).*
*The visibility is **increasing** (+) / **decreasing** (–) to 800 metres.*
*The cloud cover is **extending/increasing** (+) / **receding/decreasing** (–).*
*The weather is **improving** (+) / **deteriorating/worsening** (–).*

8 **Student A → p133** **Student B → p141** Take turns to ask and answer about how the weather is changing.

A *What is the wind doing?*
B *The wind is strengthening to 12 knots and veering to the north-west.*

Communication errors: Expectation bias

9 **Student A → p133** **Student B → p141** Take turns to correct communication errors. Communicate with your partner in both standard phraseology and plain language. Request confirmation. Your partner will make any appropriate corrections. Then change roles. Pay attention to your fluency and pronunciation and to stressing the key words when you correct.

B *Lufthansa 3165, caution: there is a thunderstorm 200 miles ahead of you and ten miles to the south-east of your projected flight path, moving north-west.*
A *Roger. Confirm thunderstorm 200 miles ahead and ten miles north-west of our flight path*
B *Negative. The thunderstorm is ten miles south-east of your projected flight path and moving north-west.*

ICAO FOCUS

"Bias in understanding a communication can affect pilots and controllers. The bias of expectation can lead to shifting a clearance or instruction from one parameter to another (e.g. perceiving a clearance to maintain a 280° heading as a clearance to climb/descend and maintain FL 280)."

Flight Safety Foundation *ALAR Briefing Note 2.3: Pilot-Controller Communication*

- What experience have you had of someone assuming something because that is what they expected to hear?
- What sorts of information could be confused?

The effect of weather on a flight path

To avoid a large storm, the flight crew must make decisions while still 40 nautical miles away from it. Therefore, the flight crew should select appropriate ranges on the NDs (Navigation Displays):

- Pilot non-flying (PNF) appropriate ranges to plan long-term weather avoidance course changes (in cruise, typically 160 nm and below)
- Pilot flying (PF) appropriate ranges to tactically avoid adverse weather and monitor its severity (in cruise, typically 80 nm and below).

Airbus Flight Operations Briefing Notes: *Adverse Weather Operations*

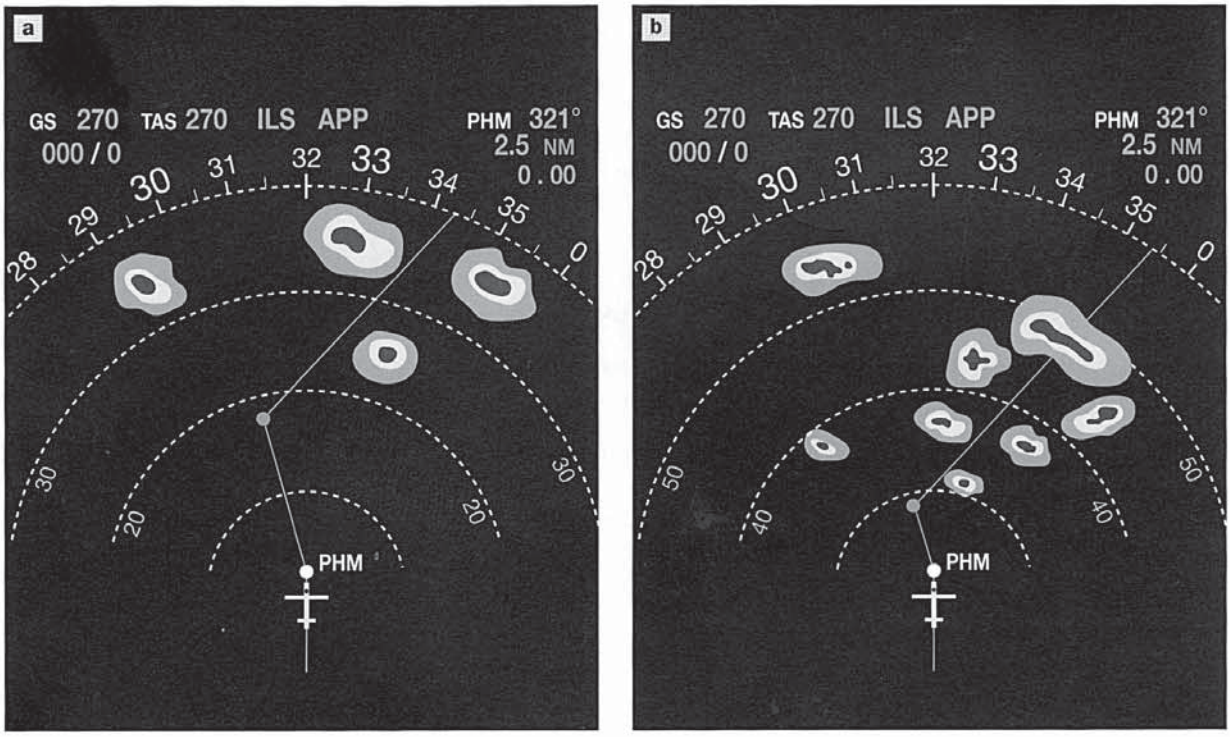
10a **Why does the PNF have a longer range on his/her radar display?**

b **In what ways does a weather radar display differ from the display used by controllers?**

c **How can weather avoidance affect a controller's workload?**

d **In what way are the consequences different in cruise and during approach?**

11a **What is the difference between these two weather radar displays at the same moment in a flight?**



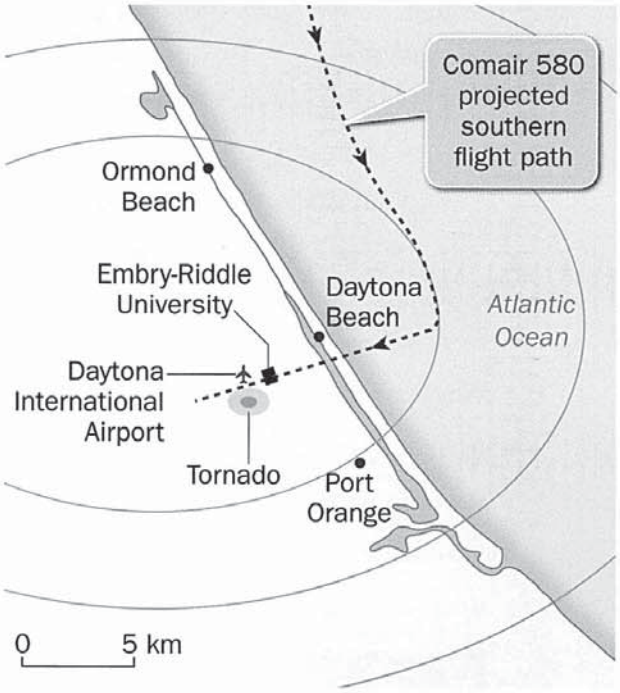
b **How do you interpret the different colours on a pilot display?**

12a **Work in pairs. You and your partner are the pilot flying (PF) and the pilot non-flying (PNF). Discuss your strategy to avoid the cloud formations in the two displays above and plot a new course to avoid the bad weather.**

b **Communicate with ATC to alter your course and explain why it is necessary.**

13a **2.06 Listen to a report of a weather-related incident, which occurred in Florida to a regional aircraft on approach during a storm. Identify the order in which the events occurred and the time at which they occurred.**

	a		Comair 580 heads south.
	b		Tornado hits Embry-Riddle next to airport.
	c		Controllers re-establish contact with Comair 580.
	d		Comair 580 heads north. Controllers then direct the plane up to a point near Flagler County and bring it back to land safely on a different runway.
1	e	1:39 pm	Comair 580 is nearing its turn for an approach to landing.
	f		Controllers direct pilot to begin turn to head north to go around the storm.
	g		The airport loses power and the controllers lose contact with Comair 580. The pilot misses his place in the landing sequence.
	h		Comair 580 continues off course, flying south.



b **In groups, use the completed table to present the flight path of the Comair flight to the class.**

14a **2.07 Listen to ten transmissions, each describing a situation in which environmental phenomena are involved. Confirm or read back the information you hear, focusing on your pronunciation and delivery.**

A *Freezing rain is expected at destination.*

b **2.07 Listen again and suggest a course of action for the pilot or give a controller instruction to your colleague to avoid or reduce the effects of the phenomenon. Use *must*, *should*, *will*, *may*, *can*.**

A (Pilot) *We **must** set the probe heat, window heat and wing and nacelle anti-icing on.*
*We **should** prepare for a longer landing distance.*

A (ATCO) *Up-to-date advisories **should** be transmitted as required.*
*The longer runway **must** be used.*

15 **Student A → p134** **Student B → p142** **Take turns to ask and answer questions about weather conditions.**

A *How high do the icing conditions extend?*
B *We are still in icing conditions at 8,000 feet. / We left icing conditions at 11,000 feet.*

Windshear

> **Overshoot windshear occurs when an aircraft encounters an increasing headwind, a decreasing tailwind or an updraft that causes an increase in indicated airspeed and/or a deviation from the desired flight path.**
>
> Mark Lacagnina, *Escape from a Microburst,* FSF *AeroSafety World*, April 2010

16 **Why is windshear such a threat for aircraft in the final phase of flight? What can ATC do to assist pilots when windshear conditions exist at an airport? What has your experience of windshear been as a pilot or controller?**

17a **2.08 Listen to an account of a windshear incident in Australia and complete the information in the table below.**

1 a/c type		9 wind conditions at threshold	
2 flight from		10 wind at 1,000 feet	
3 flight to		11 co-pilot's request to the pilot-in-command	
4 wind at 18:30		12 wind at 500 feet	
5 location of thunderstorm		13 wind at 120 feet	
6 reason why B747 did not hear windshear reports		14 airspeed (CAS) on touchdown	
7 B747's position at 19:22		15 sink rate on touchdown	
8 landing runway		16 pilot-in-command's decision	

b **In pairs, take turns to ask and answer questions about the information you recorded in Exercise 17a.**

A *What type of aircraft was involved in this incident?*
B *It was a Boeing 747-400.*

B *What were wind conditions like at the threshold?*
A *Wind direction was 180 degrees and wind speed was 22 knots.*

c **Use the table to summarise the incident in the form of a crew briefing or a report to your supervisor.**

LANGUAGE FOCUS: The same word used differently

Many words used in an operational context can be employed in different ways.

- ***control*** *__Control__ advised the crew that the wind at the landing threshold was 180 degrees at 22 knots.* (noun)
  The pilot flying __controls__ the flight path. (verb)
- ***go around*** *The pilot-in-command's decision to __go around__ was appropriate.* (verb)
  The pilot performed a __go-around__. (noun)
- ***call out*** *The PNF's __call-outs__ indicated that the wind changed.* (noun)
  __Call out__ the wind speed, please. (verb)
- ***clear*** *Can you __clear__ the data, please?* (verb)
  We are __clear__ of the storms. (adjective)

NOTE: Phrasal verbs such as *go around* and *take off* do not take a hyphen (-) and the words *around/off* are stressed. But nouns such as *go-around* and *take-off* have a hyphen; other nouns such as *readback* and *touchdown* are written as one word. *Go/take/read/touch* are stressed. These audio 'signposts' or indicators will help you understand what you hear more easily.

18a **2.09 Listen to eight sentences and choose which of the two words you hear.**

1 a call-out	b call out	5 a pull-up	b pull up
2 a readback	b read back	6 a call-out	b call out
3 a take-off	b take off	7 a go-around	b go around
4 a touchdown	b touch down	8 a read-out	b read out

b **2.10 Listen and repeat the pairs with the correct intonation.**

1 ***call****-out / call* ***out***
2 ***read****back / read* ***back***

19a **Student A → p134** **Student B → p142** **Use one of the blank tables to enter the details of an approach in windshear conditions which ends in a decision to go around. Then take turns to ask and answer questions about the approach. Take notes about your partner's approach.**

A *When did the approach take place?*
B *On August 1st, 2005 at 07:50*
A *What type of aircraft was involved?*
B *A Boeing 747-400*

b **Use your notes to describe your partner's approach.**

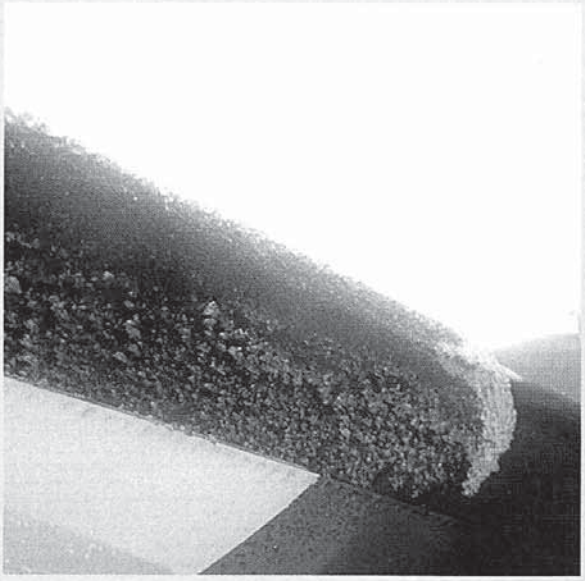
The approach took place on August 1st, 2005 at 07:50. The aircraft involved was a Boeing 747-400. It was on approach to Sydney Airport coming from Hong Kong ...

Dealing with icing

Should the pilot encounter icing conditions in flight, some recommendations are:

- In addition to using nacelle anti-icing and wing anti-icing according to procedures, the pilot should keep an eye on the icing process: accretion rate, type of cloud.
- When rapid icing is encountered in stratiform cloud, a moderate change of altitude will significantly reduce the accumulation rate. ATC is obliged to allow a level change if the pilot notifies an operational requirement.

Airbus *Getting to Grips with Cold Weather Operations*



20a **In which conditions do flights most often encounter icing?**

b **What precautions can be taken against ice build-up in flight and on the ground?**

c **Talk about your experience of the effects of ice on aircraft performance and safety.**

d **What actions may ATC have to take to assist flight crews in icing conditions?**

21a **2.11 Listen to a description of a turboprop flight in New Zealand which encounters severe icing conditions. Mark the following statements True (T) or False (F).**

1 The flight left Christchurch at 21:08.
2 The First Officer asked for a change of routeing.
3 At 21:22, ATC instructed the flight to descend from FL 130 to 11,000 feet.
4 The aircraft descended at 500 feet per minute.
5 The First Officer read back the altimeter setting.
6 The Flight Data Recorder showed that the aircraft had encountered turbulence.
7 Ice build-up on the transponder may have obstructed data transmission.
8 The aircraft disappeared from the controller's screen.

b **2.11 In pairs, listen again and check your answers.**

c **Student A → p134** **Student B → p142** **Use the cues on your page to ask your partner questions about the New Zealand flight.**

A *Did the aircraft depart on time?*

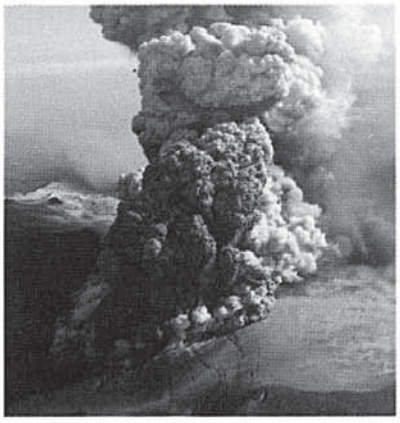
22 **Pilots → p150** **ATCOs → p160** **Take turns to acknowledge lack of understanding and give clarification. Read your transmissions to your partner. They will say if they do not understand or are not sure. Find another, simpler or more correct way of transmitting the same information. Then change roles.**

Pilot *We are executing a missed approach.*
ATCO *Say again*
Pilot *We are going around.*

Volcanic ash

"When something as painful as the volcanic ash shutdown of Europe occurs, there must be safety lessons to be learnt."

William R. Voss, President & CEO Flight Safety Foundation, 2010



23 **In pairs, answer the questions.**

1 What do these two photos have in common?
2 In what ways was the shutdown 'painful'?
3 What effects have volcanic eruptions had in your operational experience?

24a **2.12** **In pairs, match the beginnings of the sentences (1–6) to their endings (a–f). Choose the most appropriate consequence or result. Then listen to six recommendations from Boeing *Aero* on how to respond to a volcanic ash cloud and check your answers.**

1 Setting idle thrust will result in ...
2 Turning the autothrottles off prevents ...
3 Climbing out of the ash could result in ...
4 Turning on anti-ice devices and air-conditioning packs ...
5 Starting the APU ...
6 If volcanic dust fills the flight deck ...

a the engines from increasing thrust automatically above idle.
b increased engine debris build-up.
c will mean systems can be powered in a multiple-engine power loss.
d engines continuing to produce electrical power, bleed air, and hydraulic power.
e use flight deck oxygen at the 100 percent setting.
f will improve the engine stall margins.

b 2.12 In pairs, listen again. One of you take notes about points 1, 3 and 5, the other about 2, 4 and 6. Take notes about the action to be taken by the flight crew and the reasons for each action.

c Exchange information with your partner and discuss what actions you think are the most important.

d In what ways do you think ATC can best assist flight crews in the event of volcanic ash clouds?

Putting it together: Handling environmental problems

Preparation

25 Match the environmental problems (1–8) to their possible consequences (a–h).

1 The standing water on the runway may result in ...	a the pilot will enter transponder code 7700.
2 The cracked windshield could lead to ...	b near busy airports.
3 If there is an emergency ...	c severely limits visibility during approach and landing.
4 Ingesting volcanic ash can cause ...	d and result in concussion and broken bones.
5 A damaged windshield ...	e seem blurred and causes glare.
6 Bird ingestion is a major concern ...	f you aquaplaning and requiring more stopping distance.
7 Clear air turbulence may surprise passengers walking around the cabin ...	g blade damage and flameout.
8 Heavy rain during approach makes the approach and runway lighting ...	h a cabin depressurisation.

26 Pilots → p150 ATCOs → p160 Take turns to explain why you cannot comply. Give information and instructions, or ask questions, using standard phraseology as much as possible. Your partner will explain why they are unable to comply. When you have performed one set of scenarios and are both satisfied, change roles.

ATCO *Report established on localizer.*
Pilot *Unable. Our ILS display seems unreliable and is fluctuating following a lightning strike.*

ICAO FOCUS

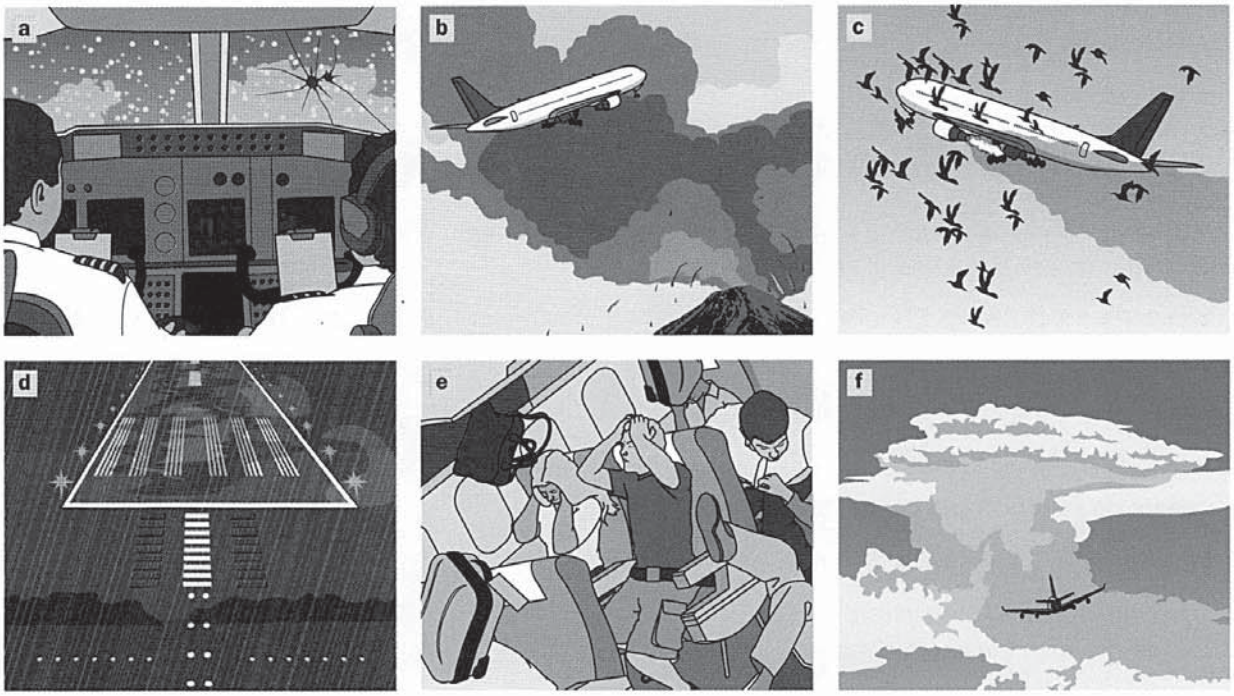
"ICAO standardized phraseology is a set of clear, concise, internationally recognized, formulaic messages designed for use in most routine situations. ... Standard phraseology, however, cannot address all of the non-routine, abnormal or, occasionally, emergency situations that occur, nor is it sufficient to convey additional information about any situation such as: reasons for a delay, the state of a sick passenger, the weather situation, the nature of a failure, or an obstacle on the runway."

ICAO Circular 323, para. 3.8.3

Give some examples of situations where standard phraseology is not enough, and plain language must be used. Explain why.

Communication

27a In pairs, choose one of the situations illustrated below. One person will be the pilot and the other the controller. Prepare a scenario in which the pilot describes the conditions on board and the controller those on the ground. Report any specific problems. Discuss the consequences of the environmental conditions, what you may be unable to do, what you must prevent and how you might negotiate a solution.



b When you are ready, role play your scenario for the class.

c Discuss the class comments and suggestions about your role play and make comments about theirs.

Debriefing

28 Debrief the scenario with the class. Identify what you felt was satisfactory about the communications and what you feel you need to improve.

Progress check

1 Complete the progress check for this unit. Assess your proficiency in these areas.
(1 = I need more work on this, 5 = I feel confident in this area)

■ I am familiar with many environmental terms.	1	2	3	4	5
■ I can understand and transmit meteorological information easily.	1	2	3	4	5
■ I can recognise and interpret the different uses of stress in English.	1	2	3	4	5
■ I can make suggestions and give advice.	1	2	3	4	5
■ I can describe and discuss radar displays.	1	2	3	4	5
■ I can ask and answer questions about past events.	1	2	3	4	5
■ I am able to rephrase information.	1	2	3	4	5
■ I can explain why I cannot comply with instructions.	1	2	3	4	5
■ I can negotiate a solution in an abnormal situation.	1	2	3	4	5

2 Choose three areas of communication from this unit which you are less confident in. Make plans for improving your skills in these three areas.

DVD Unit 5

Volcanic ash hazard

29a **You are going to watch a short training DVD in five parts from the Airline Pilots' Association (ALPA) on *Volcanic Ash Hazard: an aviation hazard of explosive proportions* on the effects of a volcanic ash cloud on a flight. What effects do you expect to see?**

b **Watch Part 1 (0.00 – 1.37) and observe:**

1 the position of the flight at the time of the incident.
2 the first indication of volcanic ash in the flight deck.
3 the first precaution taken by the crew.

30a **In Part 2, the captain is going to contact someone on the ground. Who do you think he will contact and what do you think he will say?**

b **Watch Part 2 (1.38 – 2.11) and say:**

1 who the captain contacts.
2 what the captain does and what he suggests to the First Officer.

31a **If the aircraft is flying into a volcanic ash cloud, which aircraft system do you think will be the first affected?**

b **Watch Part 3 (2.12 – 3.01) and observe:**

1 what happens to the aircraft.
2 what decision the captain makes.

32a **What do you think the captain should do now to avoid the volcanic ash cloud and regain control of the aircraft?**

b **Watch Part 4 (3.02 – 4.09) and be ready to talk about:**

1 the three actions the captain takes.
2 who he now contacts on the ground.
3 the status of the aircraft engines.
4 who you see on the ground.

33a **If a flight reports volcanic ash, what action do you think Air Traffic Control will take?**

b **Watch Part 5 (4.04 – 5.25) and take notes about:**

1 the action taken by ATC.
2 the action taken by United Airlines Dispatch.
3 the information you hear about the diversion airport.
4 the outcome of the flight.

34a **Work in pairs. Prepare the outline of an incident report with your partner and identify the information you are missing or not sure of.**

b **Watch all five parts of the video and take any notes about this missing information.**

c **Write the report together using your notes.**

UNIT 6
Level busts

COMMUNICATION FUNCTIONS

- Reporting incidents
- Communication errors: readback and hearback errors
- Distinguishing call signs, frequencies and settings
- Identifying causes
- Managing separation and level changes

Lead in

> **Level busts, or Altitude Deviations, are a potentially serious aviation hazard and occur when an aircraft fails to fly at the level required for safe separation. When reduced vertical separation minima (RVSM) apply, the potential for a dangerous situation to arise is increased.**
>
> Eurocontrol, *Level Bust Briefing Notes: General*

1a What is your personal experience of level busts as a pilot or controller?

b What standard procedures do you use to deal with level busts?

c What other types of separation are there?

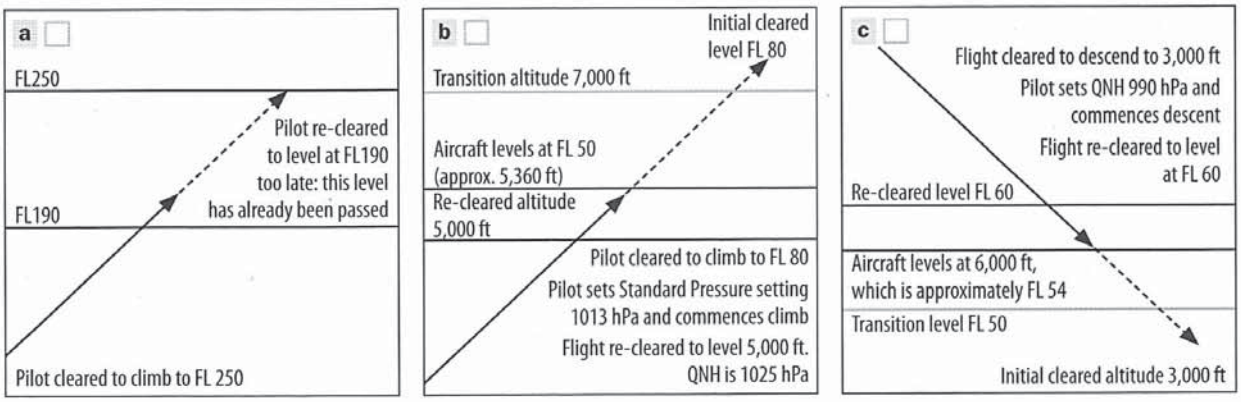
d Why do you think the potential danger is greater in the case of RVSM?

e What procedures can be adopted to guard against level busts?

Examples of level bust situations

> **Approaching Munich, a flight was informed of a change to the landing runway and cleared to descend to 4,000 feet on the intercept heading. The crew descended through 3,700 feet before climbing to 4,000 feet.**
>
> Eurocontrol, *Reducing Level Bust*

2a **2.13** Listen to descriptions of three level busts and match them to the diagrams (a–c).

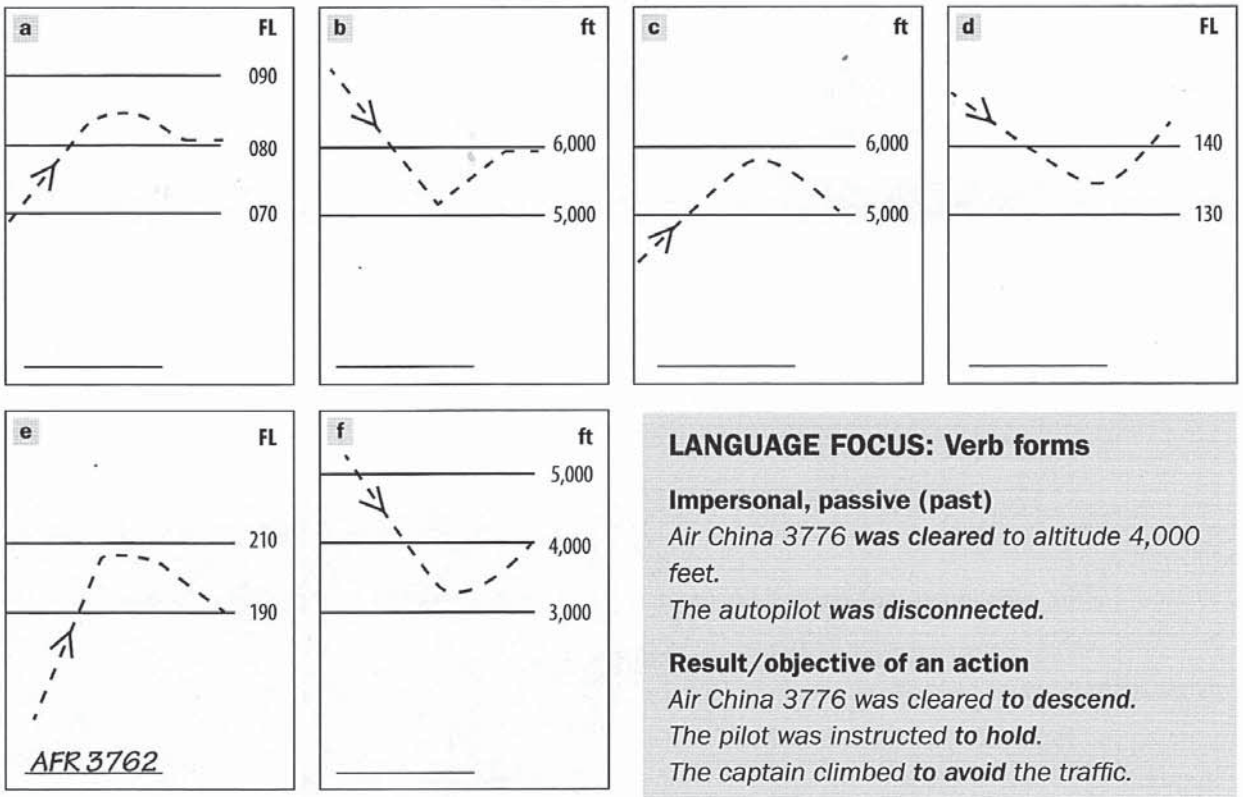


b **Describe each scenario in your own words.**

c **Which type of scenario from Exercise 2a does the incident at Munich describe? What do you think might have led to a level bust in this case?**

d **What means do controllers have to detect level busts?**

3a **2.14 Listen to six ATC transmissions and identify the level-bust situations in the diagrams below. Write the call signs on the correct diagrams.**



b **In pairs, role play the six level-bust scenarios in Exercise 3a. Take turns to be the pilot and the controller.**

4a **Complete the sentences with the correct forms of the verbs in brackets.**

1 ATC _____ [assign (past tense)] us 5,000 feet.
2 We _____ _____ [assign (past tense)] 5,000 feet by ATC.
3 The First Officer _____ [receive (past tense)] the ATIS information.
4 The altimeter is set by _____ [rotate] the knob.
5 Read back the clearance before _____ [take] any action.
6 This altitude deviation _____ [occur (past tense)] last November.
7 You can reduce the risk of level busts by _____ [follow] these recommendations.
8 Pay attention to transition levels when _____ [use] departure charts of unfamiliar aerodromes.
9 The clearance _____ _____ [issue (past tense)] at 19:32.
10 The First Officer changed frequency _____ _____ [contact] Approach Control.

LANGUAGE FOCUS: Verb forms

Impersonal, passive (past)
Air China 3776 ***was cleared*** *to altitude 4,000 feet.*
The autopilot ***was disconnected.***

Result/objective of an action
Air China 3776 was cleared ***to descend.***
The pilot was instructed ***to hold.***
The captain climbed ***to avoid*** *the traffic.*

Personal, active (past)
The crew ***descended*** *through 3,700 feet.*
ATC ***cleared*** *the aircraft to descend.*
The aircraft ***climbed*** *to FL 390.*

Following *before, after, while, by*
The crew initiated descent ***after performing*** *the checklist.*
The pilot declared an emergency ***by using*** *121.5.*

b **Complete the sentences with the words in the box.**

from	to	over	away	at	right	back	on	through

1 The crew descended _____ 3,700 feet before climbing _____ 4,000.
2 The aircraft remained _____ 6,000 feet.
3 The 747 descended _____ FL 290 to FL 210.
4 The crew made a 180-degree turn and flew _____ to base.
5 ATC must maintain separation to keep aircraft _____ from each other.
6 They stayed _____ a heading of 310 degrees.
7 The ATR 72 passed _____ the outer marker at 22:17.
8 The A321 turned _____.

5 **Student A → p135** **Student B → p142** **Take turns to report level-bust incidents. Your partner will take notes and summarise your debriefing or report.**

B *An Air Force Hercules departing Lagos was cleared to 8,000 feet, but the pilot entered the wrong altitude and climbed to 9,000 feet. ATC instructed the pilot to descend to 8,000 feet.*

6a **Match the beginnings (1–7) to the endings (a–g) to make sentences which contain *fail / failed to*.**

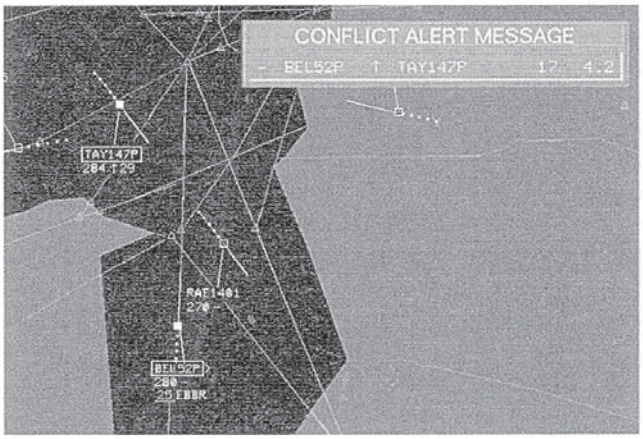
1 The pilot failed to hear the whole ...
2 The First Officer failed to cross-check ...
3 Flight crews often fail to use ...
4 The pilot failed to read back the ...
5 The PF failed to disconnect ...
6 Crews sometimes fail to distinguish between ...
7 The crew failed to level off ...

a controller's new clearance.
b the full call sign.
c the autopilot.
d transmission due to frequency congestion.
e 10,000 and 11,000 feet.
f at the level to which they were cleared.
g the captain's altimeter setting.

b **What operational experience do you have of someone failing to do something?**

7a **2.15 Listen to a report about a level bust near London Heathrow and mark these sentences True (T) or False (F). Correct the sentences which are false.**

1 The incident occurred in summer.
2 The holding pattern identifier was LIM.
3 A B737-400 entered the stack on the same frequency two minutes later.
4 The aircraft from Denmark descended to FL 140.
5 The B737 crew reported on reaching FL 150.
6 1,000-feet separation was permitted in this area.
7 The B737 descended to 14,152 feet.
8 The controllers were warned by a Short Term Conflict Alert.



b **Summarise this incident step-by-step in your own words.**

Communication errors: Readback/hearback and hearback errors

8a **2.16 Listen to two controller-pilot communications. For each one, say what is happening. Which is an example of a readback/hearback error? Which is a hearback error? What is the difference in this case?**

b **2.17 Listen to eight pilot-controller communications which contain uncorrected readback/hearback and hearback errors. Sometimes the pilot makes a mistake. Sometimes it is the controller. For each communication, take the appropriate role and correct the error.**

ATCO *Cedar Air 385, climb to altitude 5,000 feet.*
Pilot *Climb altitude 9,000 feet, Cedar Air 385.*
A (ATCO) *Cedar Air 385, negative. I say again, climb altitude 5,000 feet.*

ICAO FOCUS

"Less-than-required vertical separation or horizontal separation (and near midair collisions) and runway incursions usually are the result of hearback errors."

Flight Safety Foundation *ALAR Briefing Note 2.3: Pilot-Controller Communication*

- What is the difference between readback and hearback?
- Give examples of both from your own operational experience.
- In your experience, how common are these errors and in what circumstances are they most likely to occur?

Causes of level bust

"Not surprisingly, the causal factors behind level busts are often those that contribute to other categories of accident, i.e. poor communication, distraction, lack of standard operating procedures, cockpit and controller workload, pilot handling etc."

Eurocontrol, *Reducing Level Bust*

9a **2.18 Listen to descriptions of six incidents and match them to the causal factors (a–f) below.**

a weather
b call sign confusion (ATC error)
c call sign confusion (crew error)
d incorrect altimeter setting
1 e clearance misheard
f late re-clearance

b **2.18** Listen again and complete the notes about each incident.

Incident 1: a Clearance to _____; b Runway _____; c Pilot selected _____;
d _____ feet below
Incident 2: a Flight 478 contacted when passing FL _____;
b Clearance intended for Flight _____
Incident 3: a Aircraft cleared to _____ FL 270; b 2nd clearance _____;
c Aircraft levelled at _____
Incident 4: a Climb-out from _____; b Type of weather _____; c Deviation _____
Incident 5: a 1st clearance _____; b 2nd clearance _____; c Crew received _____;
d Crew had forgotten to set _____
Incident 6: a Crew believed they were cleared to _____; b ATC contacted crew at FL _____;
c Crew instructed to stop at FL _____

c In pairs, check your answers.

d As a controller or pilot, what similar situations have you encountered?

10 **2.19** Listen and repeat ten sentences, paying attention to clarity.

11a In pairs, prepare three short pilot-controller scenarios of communication breakdown.

b When you are ready, perform them for the class.

ICAO FOCUS

> ***"Breakdown in pilot-controller communication is a major cause of level busts."***
>
> Eurocontrol, *ATM1: Understanding the causes of level busts 4.1*

- In pairs, discuss the quote and decide on the three most common causes of pilot-controller communication breakdown.
- Describe an example of each one from your own experience.
- Report back to the class about your conclusions.

Communication markers

12a **2.20** To focus the listener's attention on the key information in a transmission, we emphasise the key words. Listen to five sentences and identify the key word or phrase in each one.

1 Caution: prohibited area eight miles ahead.

b **2.20** In pairs, compare your answers. Then listen again and repeat the sentences.

c **2.20** Listen again and decide what type of information (*what*, *how*, *when* or *where*) the key words and phrases transmit.

1 Caution: prohibited area eight miles ahead. ***where***

13a Prepare a transmission which contains information about these four elements: *what*, *how*, *when* and *where*.

Sultan 496, turn right heading 210 degrees (What). Intercept ILS at your own discretion (How). When established on localizer (When), descend on glidepath (Where), QNH 1014.

b **2.21** Listen to seven transmissions and identify the purpose (a–g) of each one.

a clearance
b instruction *1*
c conditional clearance
d correction
e question
f request
g confirmation

c **2.21** Read the Airbus FOBN extract below. Then listen again and repeat each transmission.

> **"The intonation, the speed of transmission and the placement and duration of pauses may significantly affect the correct understanding of a communication."**
>
> Airbus FOBN: *Effective Pilot/Controller communications VI.3*

14 **Student A → p135** **Student B → p143** **Take turns to prepare short instructions, requests or descriptions. Your partner will say whether the phrase gives information about *when*, *what*, *how* or *where*.**

A *Climb Flight Level 390. / Request climb Flight Level 390. / Maintaining Flight Level 390.*
B *Where.*

Memorising headings, call signs and frequencies

15a **Read the text and answer the questions.**

A considerable number of level busts are the result of communication errors between pilots and controllers: heading and altitude confusion, call sign confusion, incorrect readback or hearback.

Sensory memory ... can contain seven +/– two pieces of information depending on context and environment.

A radio frequency used often by a controller will be one element in his working memory, whereas for a pilot it may require four or five memory blocks. Conversely, the pilot's memory will 'chunk' the aircraft call sign down to one element after many repetitions, whereas the same call sign will remain at five elements for the controller since he is rarely using the same call sign for the chunking process to happen.

Copa 2839, climb to Level 350. Contact 128.325.

Controller

Copa	2	8	3	9	350	128.325

Pilot

Copa 2839	3	5	0	1	2	8	3	2	5

Consequently, the same message may well saturate the working memory of the pilot while the controller will still have some unused working memory capacity and vice versa.

Adapted from Eurocontrol, *En route to reducing level bust*

1 Which parameters can be confused in RTF?
a frequency and pressure b level and altitude c altitude and heading
2 Sensory memory is about memorising _____.
a data b sight and sound c events
3 Sensory memory can retain between _____ pieces of information.
a five and seven b five and nine c seven and nine
4 For a controller, the control frequencies he often uses will be _____ unit(s) of information.
a one b four c five
5 The aircraft call sign will be easily memorised by _____.
a the controller b the pilot c both controller and pilot
6 For the controller the call sign represents _____ unit(s) of information.
a one b two c five
7 For the pilot, the call sign represents _____ unit(s) of information.
a one b two c five

> **Effective communication requires active and intensive listening by all parties involved, concentrating on each part and word in order to fully understand the whole message.**
>
> Airbus FOBN: *Effective Pilot/Controller communications VI.15*

b **Which of these factors of context and environment may have, or have had, a negative impact on your memorisation?**

- workload
- non-standard phraseology
- flight level
- flight phase
- familiarity
- use of different languages
- stress
- time of day
- fatigue
- noise

16 **2.22 Listen to eight communications about level busts. For each one, choose the correct information.**

1	a Qatar 473 / left / 170°	b Qatar 473 / left / 270°	c Qatar 374 / left / 270°
2	a 857 / 4,000ft / 123.675	b 867 / 4,000ft / 126.365	c 857 / 4,000ft / 126.375
3	a 486 / FL 290 / 135.625	b 486 / FL 290 / 136.525	c 486 / FL 290 / 125.625
4	a 565 / 3,000 ft / 180 kts	b 656 / 3,000 ft / 190 kts	c 655 / 3,000 ft / 190 kts
5	a 283 / FL 140 / 140°	b 283 / FL 140 / 040°	c 283 / FL 240 / 040°
6	a 939 / 993 hPa / 129.3	b 393 / 993 mb / 119.3	c 939 / 993 hPa / 119.3
7	a 166 / FL 240 / not 140	b 166 / FL 140 / not 240	c 666 / FL 240 / not 140
8	a 838 / FL 190 / 090°	b 838 / FL 090 / 190°	c 383 / FL 090 / 190°

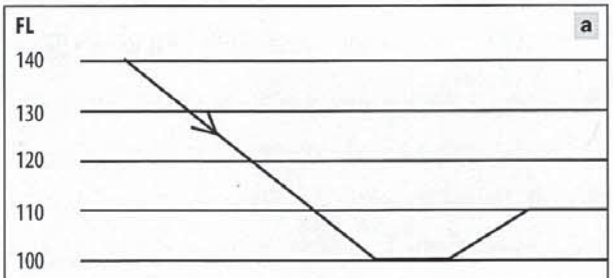
17a **Work in pairs. Each choose two of the level bust incidents in the diagrams below. Take turns to describe the circumstances of the incidents.**

A *An Aeroflot A320 was cleared to FL 110, but the crew set FL 100 on the (autopilot) Flight Control Unit. There was probably ...*

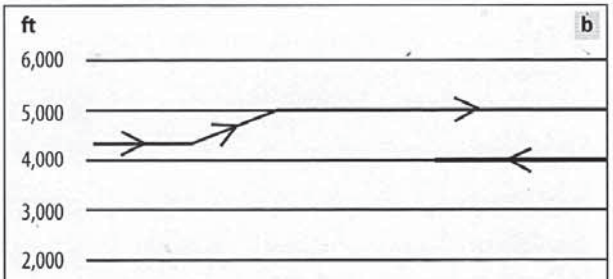
b **Discuss in pairs. What do you think were the most likely causes of each level bust?**

c **In pairs, take turns to perform the pilot-controller communications to resolve each incident.**

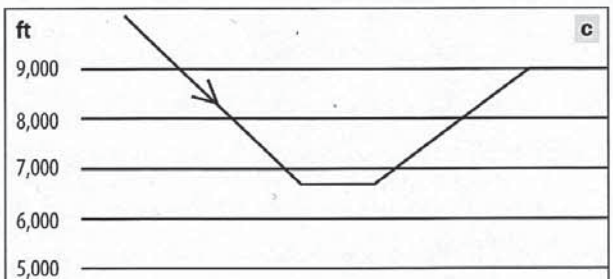
A (ATCO) *Aeroflot 358, descend Flight Level one-one-zero.*
B (Pilot) *Descend Flight Level one-one-zero, Aeroflot 358.*



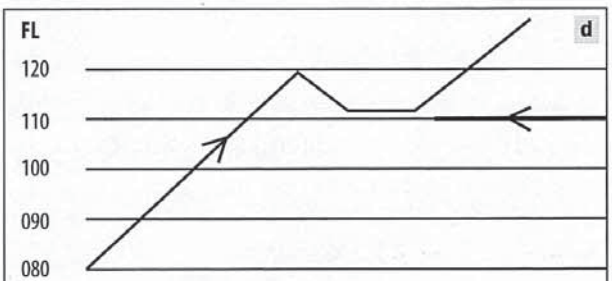
A320 / Aeroflot 358 / cleared FL 110 / FL 100 set on FCU



Saab 340 / United 1463 / cleared 5,000 ft / entered QNH 1003 instead of 1023



B747 / Cathay 3145 / cleared 9,000 ft / pilot understood 5,000 ft



ATR 72 / Arkia 289 / climbing through storm / Citation at FL 110

Putting it together: Recommendations for pilots and controllers

Preparation

18a **2.23** Listen to six controller-pilot transmissions following level busts. Identify the most probable cause in each case.

___ a blocked transmission
___ b autopilot FL entry error
___ c distraction
___ d call sign confusion
1 e TCAS RA
___ f readback/hearback error

b **2.23** Listen again. For each incident, use the cause you identified in Exercise 18a and the information in the transmissions to explain in plain English the reason for the incident.

c In pairs, decide on the three most common causes of level bust in your experience. Compare your list with the class.

ICAO FOCUS

"When standardised phraseology cannot be applied – and there are, of course, countless situations where it has no application – pilots and controllers should take special care with enunciation, intonation and phrasing, and, above all, choose simple words that make messages unambiguously concise."

Brian Day, Secretary to the ICAO PRICESG, *Careful Communication*

- In pairs, make a list of situations when standard phraseology cannot be applied.
- How easy do you think it is to be both unambiguous and concise?

19a **2.24** Listen to ten transmissions. Each transmission contains a word which has the same pronunciation as another word, but a different spelling and meaning. Choose the word you understand from the context.

1 wait / weight
2 root / route
3 no / know
4 brake / break
5 dew / due
6 crews / cruise
7 to / too
8 here / hear
9 to / two
10 aloud / allowed

b Discuss in pairs. What other words like these (homophones) can you think of? What do you think these words teach us about the importance of context when we use language?

c **2.24** Listen again and repeat each transmission, focusing on enunciation, intonation and phrasing.

checklist:

Are your clearances received by the right crew, received accurately and read back?

- ☑ Consider potential confusion between headings, speeds and flight levels
- ☑ Always query readback if you are uncertain
- ☑ Avoid conducting any other tasks during readbacks
- ☑ Notify aircraft if their call signs sound similar
- ☑ Re-check clearances following a blocked transmission

20a **Match the conditions beginning with *if* (1–8) to the conclusions (a–h).**

1 If you turn your head away from the microphone, ...	a ... the pilot may not remember them all.
2 If someone just says '250', ...	b ... advise ATC that you have heard a missed readback error.
3 If reception is poor on one frequency, ...	c ... then ask them to confirm it.
4 If you give too many instructions in the same message, ...	d ... reception will be poor.
5 If two aircraft have similar call signs, ...	e ... your situational awareness may not be as good in South America.
6 If pilots don't give their cleared level on first contact, ...	f ... the controller may assign one a different call sign.
7 If you do not speak Spanish, ...	g ... you should request confirmation of a level or a heading.
8 If you hear another pilot make an incorrect readback, ...	h ... request switching over to another one.

b **Prepare the beginning of three conditional sentences starting with *If*. In pairs, take turns to make complete sentences from your partner's prompts.**

A *If you are not sure of a clearance, ...*
B *If you are not sure of a clearance, ask the controller to say again.*

21a **Here are recommendations to avoid level busts for pilots and controllers from the UK Flight Safety Committee. In pairs, identify those for pilots (P) and those for controllers (C).**

1 Follow SOPs*. If in doubt about a clearance, confirm it with ATC, not with your colleague.
2 Pay attention to SID charts, especially where a step climb is involved.
3 Monitor readbacks; insist on correct readbacks.
4 If using *expect*, make sure *expect* precedes the cleared level.
5 Report your cleared level on first contact with a new frequency.
6 Avoid multiple instructions in a single transmission.
7 File a report on any level bust even if separation is not lost.
8 If you hear another pilot make an incorrect readback, advise ATC that you have heard a missed readback error.
9 If pilots don't give their cleared level on first contact, then ask them to confirm it.
10 Split sectors to avoid R/T loading.

*SOP: Standard Operating Procedure

b **Explain and discuss the reasons behind each of these recommendations.**

Communication

22a **Student A → p135** **Student B → p143** **Manage some traffic with your partner while respecting vertical and horizontal separation.**

- Look at the chart on your page. Three aircraft in red are visible to you both and their flight level and direction of flight are indicated. Other aircraft in blue are only visible to you. Your partner will make requests for climb and descent, which you must negotiate together. The aircraft are flying in RVSM conditions (1,000 ft vertical separation), using the same *navaid* (Caribou). The horizontal separation which you must respect is 50 nautical miles or approximately ten minutes.
- For the purposes of the activity: a 1,000 feet per minute rate of climb and descent is used. Odd flight levels (410, 390 etc.) are outbound and even flight levels (400, 380 etc.) are inbound in relation to the *navaid*.
- Take into account the relative movement of the aircraft over time when you give your clearances. You may have to delay or give step-climbs or step-descents.

B *Northwest 2693, we are a Boeing 767 50 nautical miles outbound from Caribou at Flight Level 290. Request climb Flight Level 350, Northwest 2693.*
A *Northwest 2693, unable. You have traffic above at Flight Level 310.*
B *Northwest 2693, when can we expect higher?*
A *Northwest 2693, ...*

b **At the end of your exchanges, report your movements and the aircraft's final positions to the class and compare.**

checklist:

Are your clearances understandable and given at the right time?

- ☑ Pronounce 3 as 'tree' and not as 'three'
- ☑ Avoid issuing clearances during high pilot workload
- ☑ Check rates of climb and descent when issuing new levels – is there enough time to level off?
- ☑ Speak slowly and limit the number of instructions in a single clearance

Debriefing

23 **Were you satisfied with your management of aircraft separation? Discuss those aspects which you found most challenging.**

Progress check

1 Complete the progress check for this unit. Assess your proficiency in these areas.
(1 = I need more work on this, 5 = I feel confident in this area)

■ I can report traffic movements in the past.	1	2	3	4	5
■ I can follow complex incident reports / debriefings and take notes.	1	2	3	4	5
■ I can correct readback/hearback and hearback errors.	1	2	3	4	5
■ I can identify discourse markers (purpose, e.g. *when*, *what*, *how*, *where*).	1	2	3	4	5
■ I can distinguish call signs, altitudes, levels, headings and frequencies.	1	2	3	4	5
■ I can use enunciation, intonation and phrasing effectively.	1	2	3	4	5
■ I can interpret complex written and oral information.	1	2	3	4	5
■ I can manage level change and separation.	1	2	3	4	5

2 Choose three areas of communication from this unit which you are less confident in. Make plans for improving your skills in these three areas.

DVD Unit 6

Level Best

24a **A level bust is defined in the UK as a deviation of 300 feet or more from an aircraft's assigned level. Do you know if the same definition is used in your airspace?**

b **Read this report of a mid-air collision caused by a level bust. What kind of errors were involved? What measures could help prevent such events?**

> On 12th November 1996 an Ilyushin 76 inbound to Delhi at Flight Level 150 was advised about a Saudi outbound 747 at Flight Level 140. The radio operator onboard the Ilyushin requested the range of the Saudi aircraft. ATC replied, 'Traffic is at eight miles now, Flight Level 140.' The pilot and co-pilot discussed the information and interpreted it as a clearance to descend. Realising that the pilot had commenced a descent, the radio operator shouted out: 'Keep at Flight Level 150. Don't descend.' The anxious crew began to initiate a climb. 349 people died in the subsequent collision: the worst mid-air collision in history. Research by the UK National Air Traffic Service (NATS) suggests that most level busts are caused by some form of communication error.

25a **Part 1 of the DVD (0.00 – 3.27) looks at some of the communication errors that can lead to a level bust. Watch the clip and answer the questions.**

1 What initial error occurs in the incident involving Czar 286 and Endol 675?
2 What compounded the error?
3 What incorrect phraseology contributed to the event?

b **Prepare a brief report about what happened in this incident, using the subtitles to help you.**

26a **Part 2 of the DVD (3.28 – 6.01) looks at another level bust incident. Watch carefully and note the contributing factors to the incident.**

b **Compare your answers in groups. How many factors can you identify?**

27a **Have you experienced situations similar to those in the DVD? Discuss with a partner.**

b **With a partner, make a checklist of practical suggestions for controllers to reduce the risk of communication errors occurring.**

c **Watch Part 3 of the DVD (6.02 – 7.40) and compare your suggestions with those in the clip.**

28a **Complete the advice for ATCOs on action when detecting a level bust.**

IF YOU DETECT A LEVEL BUST:

- Do not 1 _____.
- Pass effective avoiding action.
- Use the words 2 "_____".
- If it's urgent, 3 _____.

b **In what ways can a controller or pilot make a transmission sound urgent?**

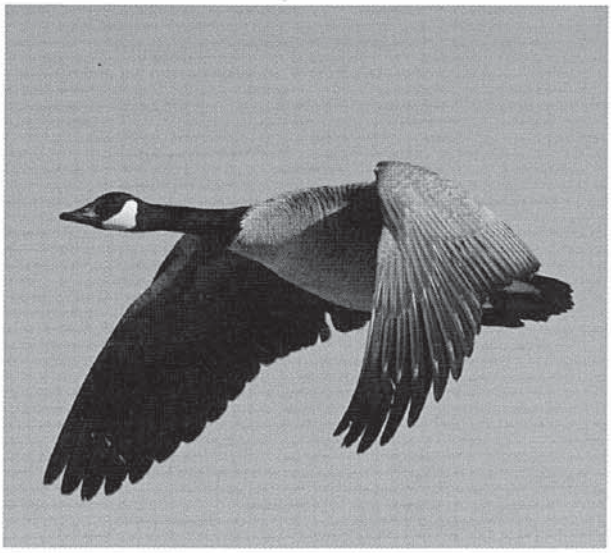
UNIT 7
Decision making

COMMUNICATION FUNCTIONS

- Incident and action reporting
- Expressing uncertainty
- Communication errors: failure to question instructions
- Dealing with a lack of language proficiency
- Feasibility
- Intention

Lead in

> **This is Cactus 1549; hit birds; we lost thrust in both engines; we're turning back towards LaGuardia.**



1a What links the photos?

b Work in groups. How much do you remember of this story?

c What do you think contributed most to the successful outcome?

US Airways Flight 1549

> **There is little doubt as to the role that the training and experience of the flight crew played in the successful emergency landing, but ultimately, it was their decision-making skill that turned a potential tragedy into a triumph.**
>
> Clarence Rash and Sharon Manning, *Thinking things through, AeroSafety World,* July 2009

2 Have you experienced a situation in which you had to use your training and decision-making skills under stress? Describe what happened.

3a **2.25 You are going to hear an extract from communications between the crew of US Airways Flight 1549 and ATC at LaGuardia, New York, which ended in a successful ditching in the Hudson in 2009. Listen and tick the phrases you hear.**

a in both engines
b turn right heading 220
c an emergency returning
d he lost both engines
e over to our right
f which runway would you like?

b **2.25 Listen again and complete the extract from communications between the crew of Flight 1549 and ATC at LaGuardia airport.**

ATCO:	Cactus* 1549**, turn [1] _____ heading 270.
US 1549:	This is Cactus 1539; hit [2] _____; we lost thrust in both engines; we're turning back [3] _____ LaGuardia.
ATCO:	OK, you need to return to LaGuardia. Turn left heading of 220.
US 1549:	220
ATCO:	[4] _____, stop your departures; we've got an emergency returning.
LaGuardia Tower:	Who is it?
ATCO:	It's 1529, it's ... he ... er, bird strike; he lost all engines, he lost the [5] _____ in the engines ... he's returning immediately.
LaGuardia Tower:	Cactus 1529, which engines?
ATCO:	He lost thrust in [6] _____ engines, he said.
LaGuardia Tower:	Got it.
ATCO:	Cactus 1529, if we can get it for you, do you want to try to land on Runway 13?
US 1549:	We're [7] _____; we may end up in the Hudson.
	...
ATCO:	All right, Cactus 1549, it's going to be left [8] _____ *** to Runway 31.
US 1549:	Unable
ATCO:	OK. What do you need to land? ... Cactus 1549, Runway 4 is [9] _____, if you want to make left traffic to Runway 4.
US 1549:	I am not sure if we can make any runway. Oh, what's over to our right? [10] _____ in New Jersey? Maybe Teterboro?
ATCO:	OK. Off to your right side is Teterboro Airport. ... Do you want to try to go to Teterboro?
US 1549:	Yes
	...
ATCO:	Cactus 1529, turn right, 280, you can land Runway 1 at Teterboro.
US 1549:	We can't do it.
ATCO:	OK. Which runway would you like at Teterboro?
US 1549:	We're going to be in the ... Hudson.
ATCO:	I'm sorry, say again, Cactus.
	...

**Cactus* = US Airways RTF identifier

***US habit of saying *fifteen forty-nine* rather than *wun fife fower niner*.

**** left traffic* = left-hand circuit

c **Answer the questions.**

1 What difference is there between the controller's first and second clearance?
2 What do you notice about the pilot's and controller's use of the flight's call sign?
3 What is the pilot's first intention?
4 Who does the controller warn about the emergency?
5 What is the initial reaction of the controller at LaGuardia Tower?
6 Which approach does the controller first propose?
7 Which is the last runway at LaGuardia the controller proposes?
8 Which option does the pilot consider after LaGuardia?
9 What does the controller propose last of all?
10 What does the pilot decide to do?

d **Discuss in groups. What signs of stress did you notice in these communications?**

LANGUAGE FOCUS: Past and present

Compare how we talk about past and present events.

past	present
*We **lost** thrust in both engines.*	*We're **turning back** to LaGuardia.*
*He **lost** thrust in the engines.*	*He **is returning** immediately.*

4a **2.26 Match the events in the past (1–8) to the resulting actions in the present (a–h). Then listen and check.**

1 We lost thrust in both engines ...
2 We had a sudden cabin depressurisation ...
3 We saw a thunderstorm ahead of us ...
4 We felt a loud thud from Engine 2 during climb-out ...
5 ATC told us to take delaying action ...
6 ATC cleared us to FL 390 ...
7 We smelt smoke in the flight deck ...
8 Area Control handed us over to Approach ...

a and are checking the engine parameters.
b and we are climbing now.
c and we are orbiting at the moment.
d and are making an emergency descent.
e and we are donning our oxygen masks.
f and are turning back to LaGuardia.
g and we are contacting them on 118.325.
h and we are turning 20 degrees right to avoid it.

b **2.26 Listen again and repeat, focusing on phrasing, pronunciation and fluency.**

5 **Student A → p135** **Student B → p143** **Take turns to obtain information from your partner about what has happened and what they are doing as a result. Confirm what you have understood and respond to any requests with appropriate information.**

B *Report on your status.*
A *We had a bird strike and lost thrust on Engine Number 1. We are turning back and request ILS approach Runway 21.*
B *You had a bird strike on Engine Number 1 and are turning back. Cleared ILS Approach Runway 21.*

6a **Student A → p135** **Student B → p143** **You each have half of the events in the six-minute flight of US Airways 1549. Without looking at each other's information, communicate to each other the information you have and number the events in the order in which they occurred.**

b **In pairs, role play the communication between the pilot and the controller using your notes from Exercise 6a.**

c **What decisions did the pilot of Flight 1549 have to make? What information did he have to take into account?**

What should we do?

7a **2.27 Match the beginnings (1–8) and endings (a–h) of conditional sentences, choosing the most immediate response. Then listen and check.**

1 If the engines relight, ...	do you want to	a divert to the nearest airport?
2 If the icing continues, ...		b make a fly pass?
3 If your passenger's pain continues, ...		c make an emergency descent?
4 If you cannot re-pressurise the cabin, ...		d change heading?
5 If the smoke does not stop, ...		1e continue your flight?
6 If there is a severe storm ahead, ...		f declare an emergency?
7 If the visibility is good, ...		g climb out of the cloud layer?
8 If you are not sure the gear is down, ...		h make a visual approach?

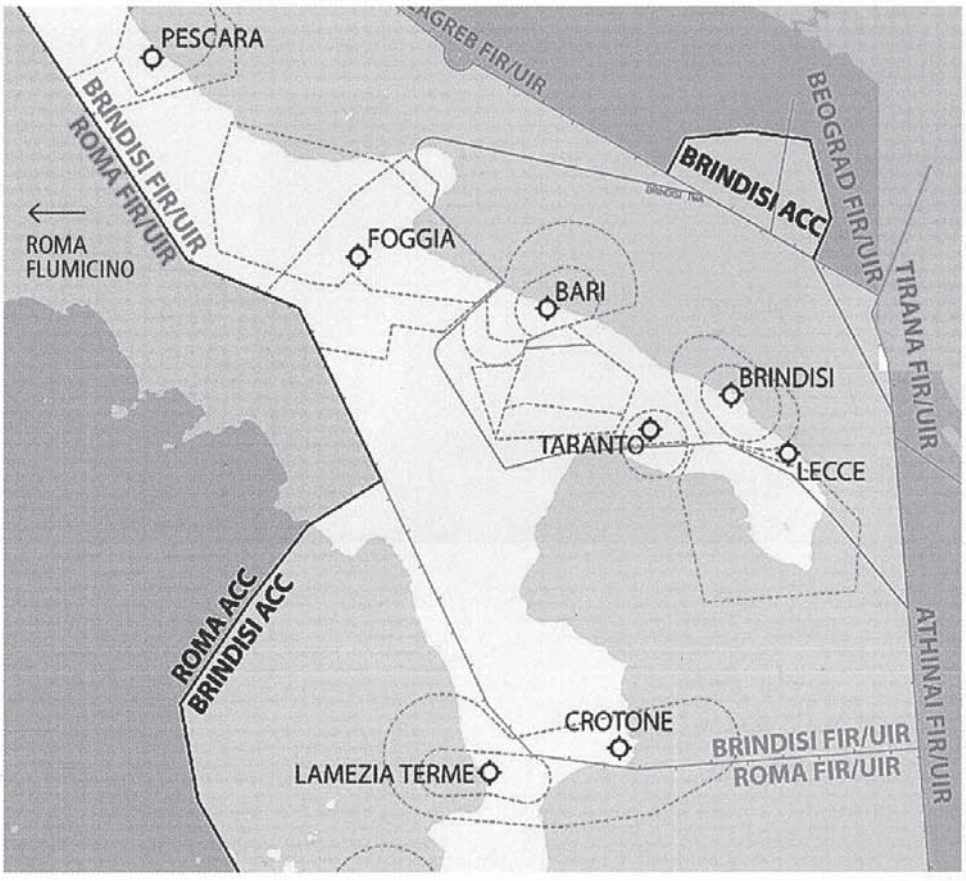
b **2.27 Listen again and repeat the sentences.**

8 **2.28 Listen to the cues and express your uncertainty by saying *I'm not sure ...*, *I don't think ...*, or *I don't believe ...***

Cue
relight the engine

A *I'm not sure we can relight the engine.*

9a **Pilots → p151** **ATCOs → p160** **Look at the data of an in-flight scenario. Pilots contact the Area Controller to inform them of the situation and discuss different options. There will be things you want to do and things you are not certain of.**



Brindisi Area Control Centre

b **Report back to the class about the circumstances, series of events and decisions you took.**

Communication errors: Failure to question instructions

10 **2.29** **Listen to ten ATCO instructions. Each time the instruction does not seem to match the current situation or your expectations (1–10), which are listed below. Pilots Question the controller's instructions to make sure that there are no mistakes. ATCOs Correct the controller's initial instruction.**

ATCO *Midland 1263, turn left heading 160*
Pilot *Heading 160. Our present heading is 050. Confirm turn left, Midland 1263.*
ATCO *Midland 1263, correction: turn right heading 160.*

1 Present heading 050°; turn right
2 Present level FL 370
3 Present altitude 4,000 ft; terrain at 1,600 m to the NW
4 Aircraft actually Iberia 4373
5 Aircraft too heavy
6 Usually RWY 12R
7 Terrain up to 3,900 m to the right
8 Minimum Safe Altitude to the SW 4,000 ft
9 190 kts OK?
10 Traffic same level, to right

ICAO FOCUS

"Failing to question an instruction can cause a crew to accept an altitude clearance below minimum safe altitude (MSA) or a heading that places the aircraft near obstructions."

Flight Safety Foundation *ALAR Briefing Note 2.3: Pilot-Controller Communication*

- **Which of these factors are most likely to stop a pilot from questioning an instruction?**

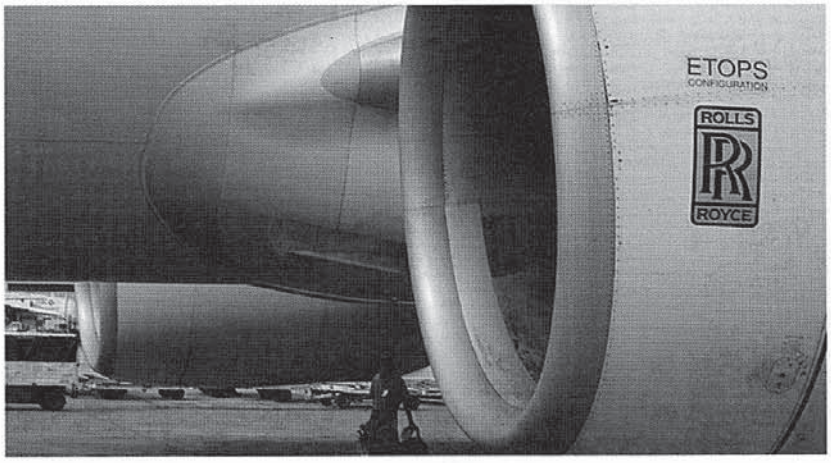
workload respect language proficiency
poor radio communication distractions
trust lack of situational awareness
fatigue expectation bias habit

- **What examples from your own experience can you think of?**

ETOPS: Diversion at night

11a **What is meant by an ETOPS flight? Why are ETOPS flights more and more common today?**

b **You are going to hear the story of an ETOPS flight where the pilot had to make a decision following a system failure. Match the beginnings (1–8) to the endings (a–h) of these sentences. Then, in pairs, check your answers.**



1 You are flying an eastbound ETOPS transatlantic ... — c
2 The flight is planned for a northerly route ...
3 The first alternate ...
4 Approaching 90° West, you notice that the oil quantity ...
5 Both you and the First Officer look in the logbook ...
6 You assume the oil loss is real and ...
7 However, the fall in oil quantity ...
8 You consider alternatives ...

a for oil checks.
b does not stop.
c route at night.
d contact Dispatch.
e such as flying back 150 minutes.
f is an airport at 90 degrees West.
g is dropping on Engine 2.
h to benefit from upper-level winds toward Europe.

c **2.30 Listen to eight sentences about an ETOPS flight, containing the words (1–8) below and underline the part of each word which is stressed.**

1 <u>east</u>bound	3 alternate	5 assume	7 indication
2 established	4 diagnosis	6 alternatives	8 consult

d **2.30 Listen again and repeat the sentences, paying particular attention to word stress and intonation.**

12a **2.31 Listen to a description of the first part of an ETOPS transatlantic flight and complete the information below.**

1 Time of day		5 Pilot contacts	
2 Flight Level		6 Time from origin	
3 1st alternate		7 Time to preferred airport	
4 Technical problem		8 Problem with nearest airport	

b **In pairs, discuss what you would decide to do in this situation, and why. Then report back to the class.**

c **2.32 Listen to what the captain actually decides to do on the transatlantic flight and mark the sentences True (T) or False (F).**

1 The captain decides to divert immediately.
2 The captain decides to divert if the problem becomes worse.
3 The oil pressure decreases after 50 minutes.
4 The cabin crew prepare the cabin for a precautionary diversion.
5 The captain shuts down Engine 2.
6 The crew can intercept the Localizer early.
7 Engine 2 had four litres of oil on landing.
8 There was no damage to the engine.

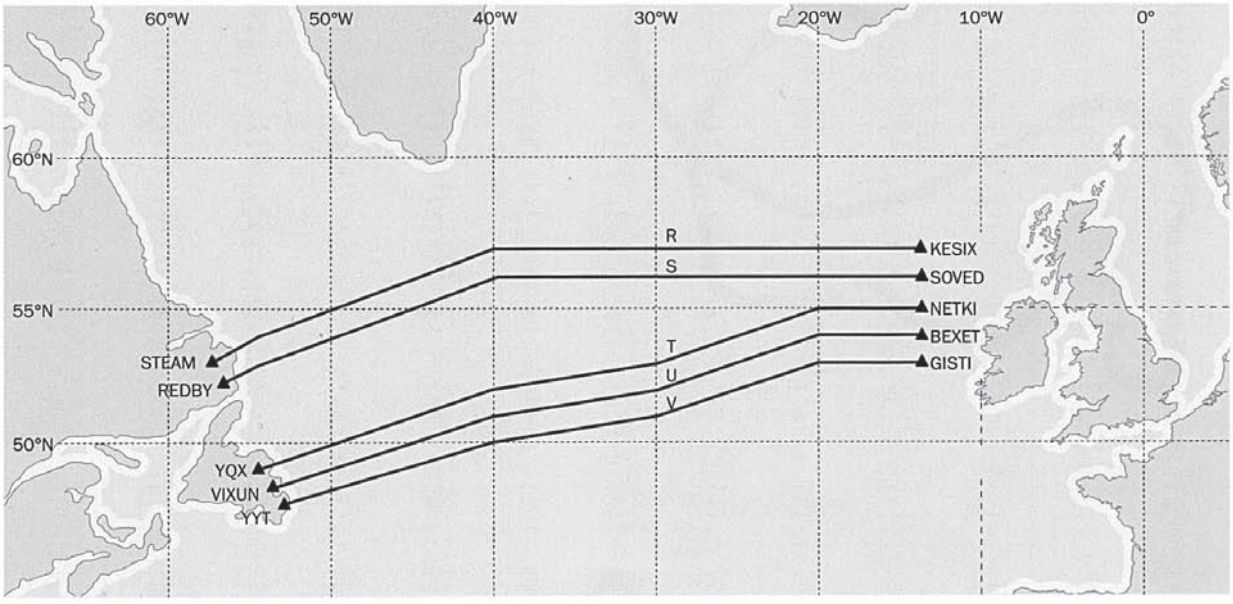
d **Describe the captain's decision-making process. What were his reasons? Do you agree with his conclusions? Did he do the right thing, or was he lucky?**

13a **Pilots → p151** **ATCOs → p161** **Use the situational chart and your information to decide on the best airport to divert to.**

Pilot *We are a Boeing Triple Seven dash 300 Extended Range heading 095 at Flight Level 390. We have just experienced an engine failure. Can you give us various alternatives for a diversion?*

ATCO *You are within 320 nautical miles of three airports. ABC is at 160 nautical miles ...*

b **Report back and compare and discuss your decision with the rest of the class. Say which you think was the best solution and why.**



Decision making and the language barrier

14a **2.33 Listen to a description of an incident and mark the order in which the information (a–h) is mentioned.**

a The captain was not always able to understand the controller.
b The controller was afraid the crew would land on Runway 09 Right.
c The return flight lasted just under half an hour.
d The aircraft flew a heading of 360° and not 025°, as instructed.
e The display units failed.
f Another aircraft had to be re-routed.
g There was no damage to the aircraft.
h The First Officer was the PF.

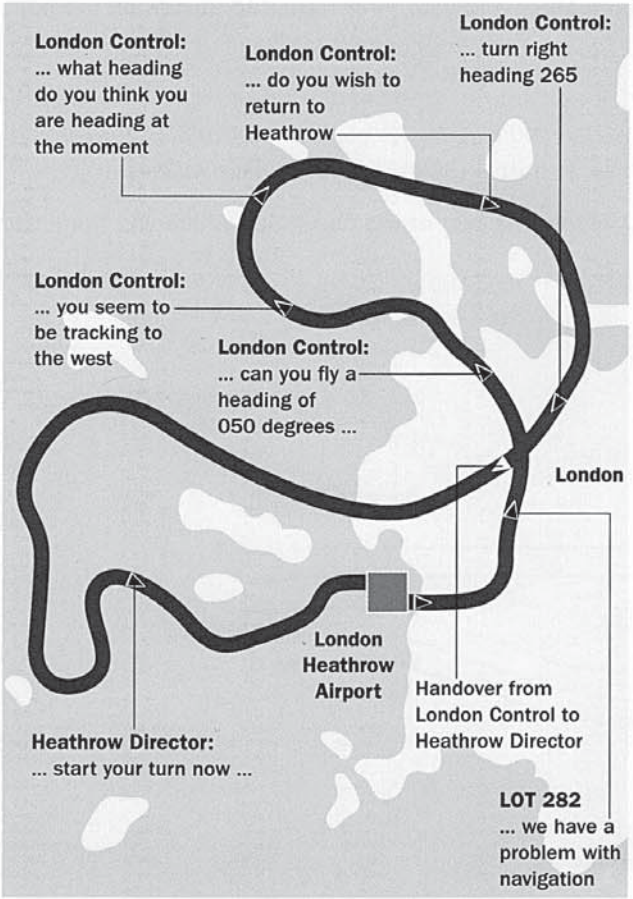
ICAO FOCUS

"The pilots in the incident airplane had their hands full flying the airplane in IMC with only standby instruments; communicating in English with ATC was an added burden."

Captain Rick Valdes, United Airlines, IFALPA representative to ICAO PRICESG, in Flight Safety Foundation *AeroSafety World*, August 2008

- **What other way of saying *to have your hands full* can you think of?**
- **What are IMC?**
- **When do you have to use standby instruments?**
- **Why might communicating in English complicate your workload?**

b **Describe the flight path flown by the B737 in this incident.**



LANGUAGE FOCUS: Breaking down the language barrier

Here are some phrases which may help if language proficiency is an obstacle:

What is the nature of your problem?
Do you require assistance?
Have you got hydraulic power?
Advise intentions.
What do you require/want?
Is the situation serious?
Is this a medical emergency?
Is the damage severe?
Do you wish to declare an emergency?
Did you say ...?
Do you mean ...?

Say again slowly.
Say all words twice.
Describe / Tell me the situation.
I'm listening.
I'm here.
Confirm you received my last transmission.
Ask another crew member.
Say what you want.
Say your fuel situation.
I say again (slowly).

15 **2.34 Listen to six exchanges where there is a language breakdown. Sit back-to-back with your partner and continue the exchanges. ATCOs Ask questions. Pilots Clarify the situation.**

ATCO *Report the situation on board.*
Pilot *Report ... passenger ... bad.*

ATCO *Do you mean a passenger is injured?*
Pilot *Passenger very bad.*
ATCO *Is this a medical emergency?*
Pilot *Medical ... Eh ... Negative.*
ATCO *Is a passenger dangerous ... violent?*
Pilot *Affirm ... passenger dangerous ...*

16 **Pilots → p152 ATCOs → p161 Take turns to describe and ask questions about an unusual situation.**

Pilot *Our windshield has been broken by a hailstorm.*
ATCO *Are there any injuries?*
Pilot *Negative. No injuries.*
ATCO *Which windshield is broken?*
...

Reasons and feasibility

17a **Complete the table. Match the abbreviations in the box to the correct words and phrases (1–12).**

ADF DME HDG IMC VMC IAS RTF ETOPS UTC VHF VSI VOR

1	the direction you are flying in	5	something measured in knots	9	distance to and from a beacon
2	time	6	most used radio frequency	10	instrument calibrated in feet per minute
3	radio communication	7	flight with visibility	11	bearing to/from non-directional beacon
4	flight without visibility	8 ETOPS	long range, two-engine flight	12	radio beacon using frequency range between 108.00 and 117.95 MHz

b **Describe the context in which each abbreviation is used during the flight.**

LANGUAGE FOCUS: Cause and effect

When a problem occurs, it is often necessary to ask why. This is a step in the decision-making process.

There are different ways of explaining the cause.

Why did *the pump fail?*

A drop in oil pressure ***caused*** *the pump to fail.*
The pump failed ***because*** *there was a drop in oil pressure.*

Why was *the flight late?*

The headwinds aloft ***resulted in*** *the flight being 30 minutes late.*
The flight was 30 minutes late ***due to*** *headwinds aloft.*

Why are *you diverting?* (Report reason)

The engine failure has ***forced*** *us to divert.*
We have to divert ***because of*** *the engine failure.*

18 **Pilots → p152** **ATCOs → p162** **Take turns to question either the pilot or the controller about the cause of an event. Use your own experience to suggest a probable cause. The information may be about the present or the past.**

ATCO *Why did you make an emergency descent?*
Pilot *We made an emergency descent because of a cabin depressurisation.*

LANGUAGE FOCUS: Feasibility

Asking about and announcing feasibility – if something is possible or not – is one of the communication functions identified by ICAO Doc. 9835 (Appendix B-3 2.6).

***Can you** increase your rate of climb?*
***Are you able** FL 410?*
***Will you be able to** make SAB by 18?*
***Is** an ILS approach **possible** to Runway 09R?*
***Is it possible** to make/request a straight-in approach?*
***Are you ready** for immediate departure?*

Of course, in most cases, the answer will be ***affirm*** or ***unable***.

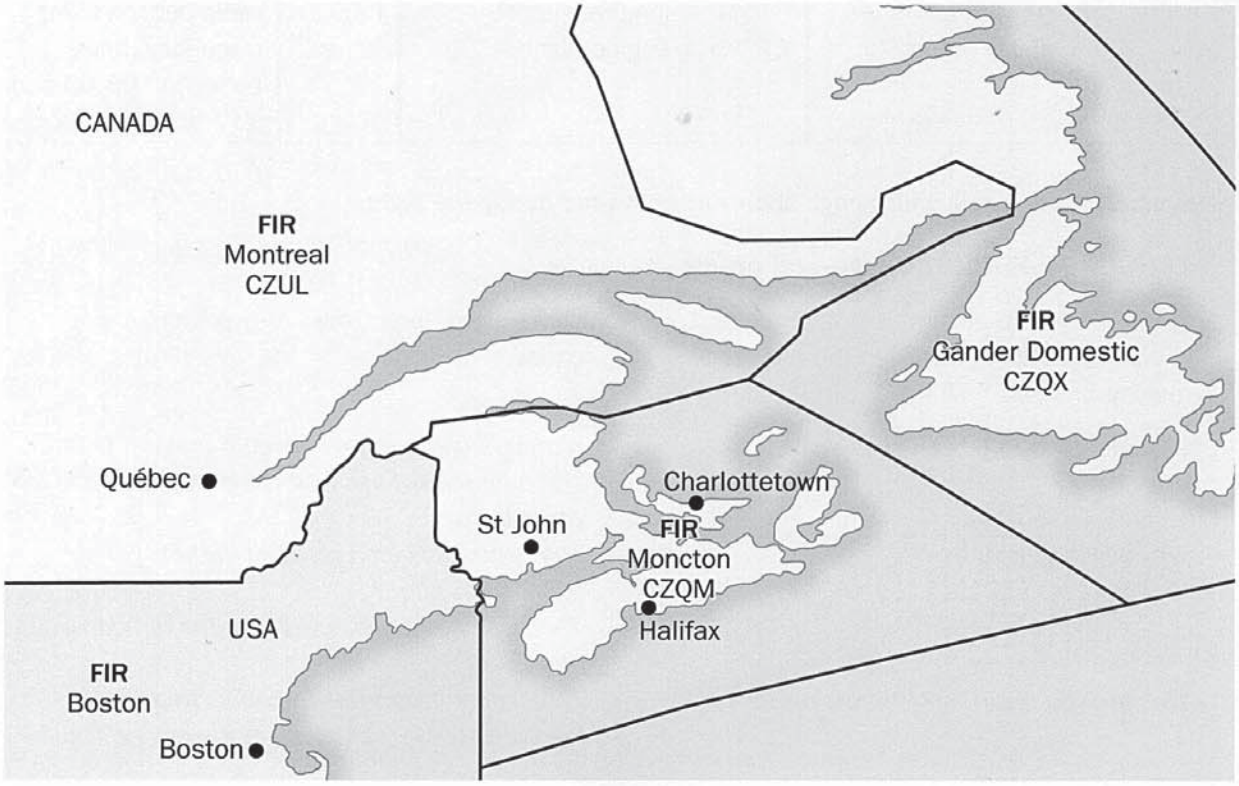
19a **2.35** **Listen to ten verbal cues and use the different phrases in the *Feasibility* box to ask whether something is possible. Respond to the questions and explain if you are unable.**

Cue
Maintain your present flight level?

A *Are you able to maintain present flight level?*

b **Pilots → p152** **ATCOs → p162** **Take turns to check information and feasibility. The captain of Flight EI 137 will describe a series of events during the flight. At each stage, the controller will ask if something is possible or for further information.**

Pilot *Shamrock 137, we are an Airbus 330 at Flight Level 380 heading for Boston. The cabin crew have reported an unruly male passenger.*
ATCO *Shamrock 137, in what way is he unruly? What has he done? Advise intentions.*



Making decisions under stress

> **Prolonged stress may affect cognition. For example, under high-stress conditions, there is a tendency to oversimplify problem-solving and decision-making and to ignore important information – to take the easy way out.**
>
> **Clarence E. Rash & Sharon D. Manning**

20a **Think of a situation on the flight deck or at your work station where you had to make a decision. Make a list of all the different factors you had to take into account in order not to oversimplify the process.**

b **What techniques do you have for combating stress?**

c **Which of these sources of stress has had the biggest impact on your daily work?**

- sleep deprivation
- mental fatigue
- family problems
- hunger
- insufficient language proficiency
- altitude effects
- high workload
- information overload
- decreased vision

LANGUAGE FOCUS: Intention

During an unusual situation, you will often have to ask other people about their intentions or inform them of yours.

- **ATCO** ***Advise intentions***
  Do you intend to *divert?*
- **Pilot** ***We intend to*** *divert.*
  Affirm, *diverting*

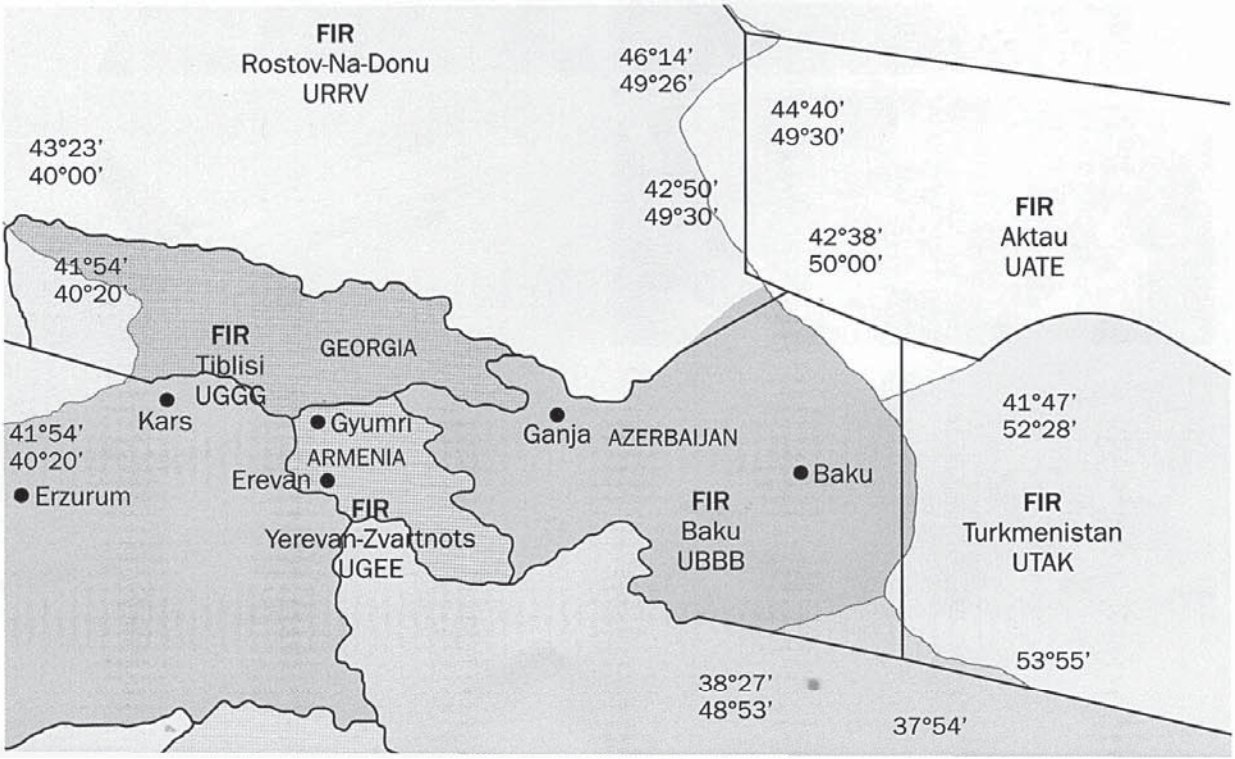
d **In pairs, rank them in order of seriousness. Then compare your ranking with the class.**

21a **Student A → p136** **Student B → p143** **Take turns to ask and answer questions about intentions. Pay attention to sentence stress in your questions and answers.**

A *Do you intend to turn back? Advise intentions.*
B *We intend to continue.*

b **Pilots → p153** **ATCOs → p162** **Take turns to describe events and ask for intentions. Pilots, use cues to describe events in one flight. Controllers, ask for intentions and suggest a course of action during the flight.**

Pilot *We just had a flame-out on Engine number 3 as we passed FL 275.*
ATCO *What are your intentions? Will you return to land?*
Pilot *Negative. We intend to continue to our destination for the moment, unless the engine deteriorates further. ...*



Putting it together: Managing an unexpected turn of events

ICAO FOCUS

"The need for plain language proficiency can arise quickly, whenever an unusual situation develops."

Elizabeth Mathews, linguistic consultant to the ICAO PRICESG

- When do you most need plain language as opposed to standard phraseology?
- What effect do you think stressful situations have on the ability to communicate in another language?
- How do you think that this affects the way in which you should learn English for operational purposes?

Preparation

22a **Discuss in groups. As pilot or controller, what would you do, or what precautions would you take, in these situations?**

1 The captain is incapacitated and the First Officer has to handle a non-precision approach in poor visibility.
2 Poor visibility at a neighbouring airport has resulted in all traffic being diverted to your airport.
3 Your son is in hospital and you have been away for five days.
4 You arrived late last night. The hotel was very noisy and you have a flight which departs at 08:30.
5 There is a power cut at the airport and ATC computerisation is downgraded.
6 Your landing gear is not properly extended.
7 The ATIS is inoperative at your destination.
8 Two controllers are missing on your shift.

b **What effects might the stress have on your behaviour in each case?**

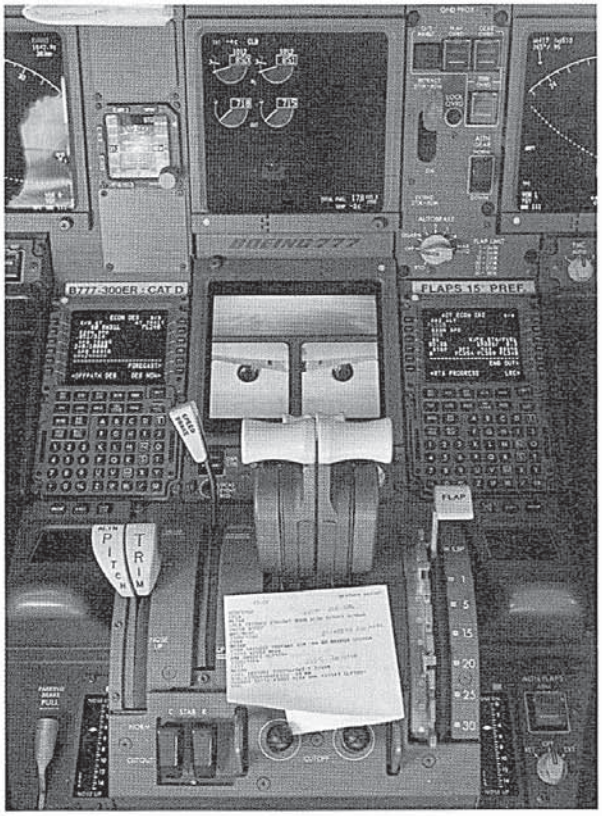
23a **In groups, brainstorm the vocabulary required to describe what is happening in these situations.**

b For each situation in Exercise 23a, describe to your partner 1) what has happened, 2) the present situation and 3) what you intend to do.

c Debrief with the teacher and the other students. Report back about what you found difficult to describe.

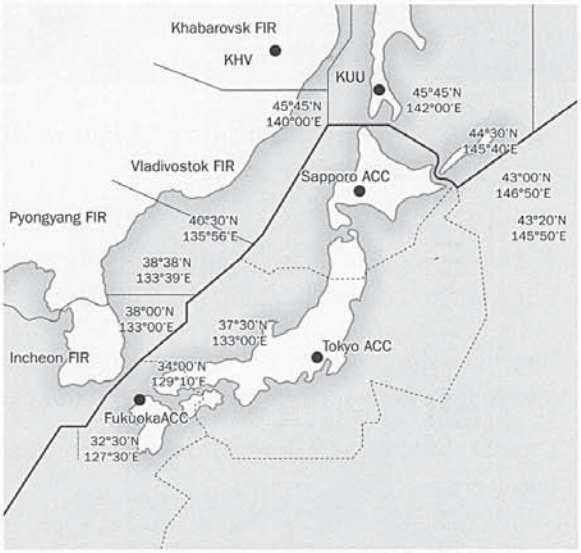
Communication

24 **Pilots → p153** **ATCOs → p162** Take turns to manage a series of abnormal events. Perform readbacks and clarify or confirm any information you are not sure of.



Pilot *Khabarovsk Area Control, Japan Air 401, we are a Boeing 777 at Flight Level 310, heading 340 degrees. There is a large CB showing on our weather radar 30 miles ahead. Request turn right 20 degrees, Japan Air 401.*

ATCO *Japan Air 401, turn right heading 360.*



Debriefing

25 Report back to the class about the different stages and types of communication in the scenario. Did you find that you managed the situation effectively and that your interactions were clear and fluent?

Progress check

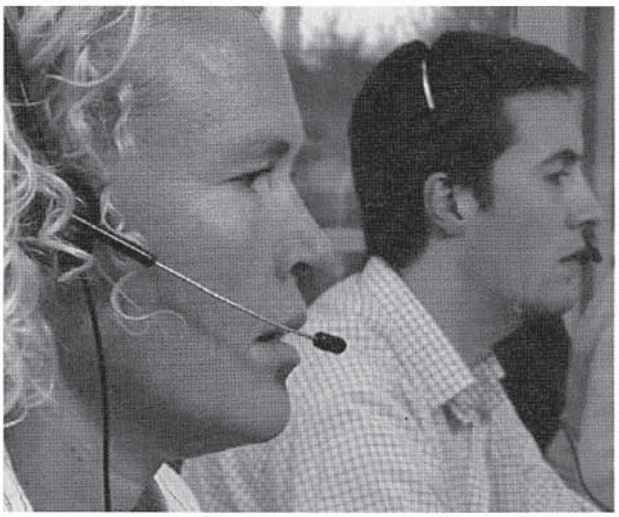
1 Complete the progress check for this unit. Assess your proficiency in these areas.
(1 = I need more work on this, 5 = I feel confident in this area)

■ I can report an incident and describe a present course of action.	1	2	3	4	5
■ I can introduce a condition and ask what someone wants to do.	1	2	3	4	5
■ I can express uncertainty.	1	2	3	4	5
■ I can confidently question an instruction.	1	2	3	4	5
■ I can deal with someone with poor language proficiency.	1	2	3	4	5
■ I can talk about why something happened and if something is possible.	1	2	3	4	5
■ I can distinguish between events in the immediate and more distant past.	1	2	3	4	5
■ I can express my intentions.	1	2	3	4	5
■ I can negotiate a course of action.	1	2	3	4	5

2 Choose three areas of communication from this unit which you are less confident in. Make plans for improving your skills in these three areas.

DVD Unit 7

Loss of communication



26a **Watch the Eurocontrol clip *Loss of communication*, which illustrates a problem caused by readback error. What can you say about:**

1 the initial problem.
2 your impression of the flight crew's attitude.
3 the various distractions on the flight deck.

b **Why does the flight crew of Ajet 2745 lose contact with Air Traffic Control? Which piece of information is misunderstood, and what happens as a result?**

27a **Look at these three extracts from the transcript of the communication and say exactly which errors occur in each case:**

1

Controller A	*Contact 128.050, Ajet 2745, thank you and goodbye.*
Cabin attendant	*I'll check for you. Do you have any preference?*
F/O	*No, I'm easy.*
Captain Ajet 2745	*Contact 128.090, Ajet 2745, thank you and goodbye.*

2

Captain Ajet 2745	*Control, Ajet 2745, maintaining FL 310 … Control, Ajet 2745, maintaining FL 310 … Control, Ajet 2745, do you read? … What was the new frequency?*
F/O	*Sorry, I'm not sure.*
Captain Ajet 2745	*That's it: 128.090.*

3

Controller C	*Ajet 2745, did you call?*
Captain Ajet 2745	*Ajet 2745, request descent.*
Controller C	*Ajet 2745, descend FL 260.*
Controller B	*Zjet 979, descend immediately FL 200; you have traffic at your ten o'clock position, descending towards you … Who's got Ajet 2745?*
Controller C	*He's here.*

b **What do you think the pilot should have done when he found he had lost communication?**

c **Were the controllers also affected by any distractions?**

29 **As a pilot or a controller, have you ever experienced similar situations?**

PART B REVIEW
En-route

Pronunciation

1a **2.36 Listen to ten sentences and choose the verb ending you hear.**

1 asks – asked – ask
2 have – has – had
3 reporting – reported – report
4 suffer – suffers – suffered
5 remain – remaining – remained
6 climb – climbed – climbing
7 clear – cleared – clears
8 passing – passes – passed
9 passing – passes – passed
10 climb – climbed – climbing

b **2.36 Listen again and repeat each sentence, focusing on the word endings.**

c **2.37 Listen to and repeat the transmissions, focusing on phrasing and fluency.**

d **2.38 Listen to ten sentences and choose the word you hear.**

1 hear / here	3 hole / whole	5 weather / whether	7 sea / see	9 eight / ate
2 missed / mist	4 it's / its	6 mail / male	8 wear / where	10 two / to

Structure

2a **Match the beginnings (1–8) with the correct endings (a–h) to make conditional sentences.**

1 If several languages are used on the frequency,	a if you lose an engine.
2 Always ask for confirmation	b a TCAS RA will be triggered.
3 If the situation is urgent,	c we will change the runway in use.
4 It is easy to be at the wrong altitude	d if you are not sure of an instruction.
5 If two aircraft are on converging courses,	e the crew will need to don their oxygen masks.
6 Should the wind change direction considerably,	f if you do not make the correct barometric setting.
7 If volcanic ash fills the cockpit,	g it is difficult to maintain situational awareness.
8 Try to start the APU	h express urgency in your voice.

b **Complete the sentences (1–8), which give cause or reason, with the words in the box.**

because due resulted in so because of force has made caused

1 All flights were grounded _____ the volcanic ash cloud.
2 Runway 23R is closed _____ maintenance is being carried out.
3 The heavy weather build-up will _____ the crew to change course.
4 The strong headwinds _____ the flight being behind schedule.
5 It is raining heavily, _____ the braking action is poor.
6 The adverse weather _____ traffic slow.
7 We are unable to accept FL 390 _____ to our weight.
8 The damage to the leading edges was _____ by a hailstorm.

c **Complete the sentences with the correct form of the verb.**

1 There is a volcanic cloud _____ south west from Iceland.
a moved b moving c moves
2 Oxygen masks will deploy automatically if cabin altitude _____ 14,000 feet.
a exceeds b exceeded c exceed
3 The ATCO issues a clearance _____ or descend to a specified flight level.
a climbing b to climb c climb
4 The visibility _____ to 700 metres.
a decreases b decrease c is decreasing
5 We just _____ a flame-out on Engine Number 3.
a have b has c had
6 We intend _____ to our destination.
a to continue b continue c continuing
7 The controllers _____ by a Short Term Conflict Alert.
a warned b are warning c were warned
8 To _____ a large storm, the flight crew must make decisions while still 40 nautical miles away from it.
a avoid b avoiding c avoided

Vocabulary

3a **Complete the sentences (1–8), which describe changing weather situations, with the words in the box.**

increasing heavier scattered thicker weakening lift veering gusting

1 The fog is getting _____ and the RVR is decreasing.
2 The wind is _____ to the south-west.
3 Visibility is _____ and we'll soon be in VMC conditions.
4 The wind speed is 14 knots, _____ to 21 knots.
5 The rain is getting _____.
6 The fog should _____ later in the morning.
7 The headwinds are _____ and we are making better progress.
8 With rising pressure and strengthening winds, there are only _____ clouds.

b **Complete the sentences (1–8), which describe in-flight actions, with the words in the box.**

climbing orbiting making monitoring turning donning turning back contacting

1 ATC told us to take delaying action and we are _____ at the moment.
2 We lost thrust in both engines and we are _____ to LaGuardia.
3 We saw a thunderstorm ahead of us and we are _____ 20° right to avoid it.
4 Area Control handed us over to Approach and we are _____ them on 118.765.
5 ATC cleared us to FL 390 and we are _____ now.
6 We smelt smoke in the flight deck and are _____ our oxygen masks.
7 We had a sudden cabin depressurisation and are _____ an emergency descent.
8 We felt strong vibrations from Engine 2 during climb-out and we are _____ the engine parameters.

Fluency

4a **2.39 Listen to eight pilot transmissions and respond appropriately to each one.**

Pilot *We have lost most of our main instrument displays and are using our standby instruments.*
A (ATCO) *Say your position. Do you wish to make a precautionary landing?*

b **2.40 Listen to eight controller transmissions and respond appropriately to each one.**

ATCO *Be advised that several flights have been reporting turbulent conditions at your present level.*
A (Pilot) *Where exactly was the turbulence located, how severe was it and how long did it last?*

Comprehension

5a **2.41 Listen to the ATIS and take notes.**

Airport		Visibility		Dew point	
Information		Cloud		QNH	
Time		Ceiling		ILS RWY	
Wind velocity		Temperature		Departures RWY	

b **2.42 Listen to the report of a level bust incident and mark the statements True (T) or False (F). Then answer the question at the end of the recording.**

1 ATC clears Flystar 259 to descend to FL 190.
2 Flystar 259 is above other traffic in the vicinity.
3 Flystar 259 descends due to a TCAS RA.
4 The controller understands what is happening.
5 Shamrock 148 is en route to Dublin.
6 Shamrock 148 remains at FL 180.
7 Errors are made by both the pilot and the controller.

Interactions

6 **2.43 Work in pairs. Listen to the beginnings of ten ATCO-pilot exchanges and continue the conversations as ATCO and pilot. Try to find a solution together.**

ATCO *Descend Flight Level 130.*
Pilot *We have trouble with descent.*
A (ATCO) *Say what exactly the problem is, please.*
B (Pilot) *Pitch control ... elevator respond bad.*
A *Have you any warning lights?*
B *Affirm. Actuator failure.*
A *Say your heading and altitude.*
B *Heading 240 degrees ... passing Flight Level 170 ... descending to Flight Level 130.*
A *What are your intentions?*
B *...*

UNIT 8
Approach and landing incidents

COMMUNICATION FUNCTIONS

- Correcting erroneous expectations
- Asking about availability
- Communication errors: uncorrected erroneous readback
- Expressing concern
- Describing precautions
- Expressing urgency
- Relaying information

Lead in

> **Both the Copilot and I misread the GLAND SIX Arrival chart as 'expect clearance to cross GLAND at 10,000 feet and 250 knots.' Actually, it said 'Cross GLAND at 250 knots, expect clearance to cross at 10,000 feet.' ... The [Approach] Controller asked our airspeed and we told him it was 290 knots. He said it should have been 250 knots, since that was a *mandatory*, not an *expect*, restriction. ... You see what you expect to see.**
>
> NASA Aviation Safety Reporting System

1a Explain the difference between what the pilots thought was written and what was actually written.

b What is the difference between *mandatory* and *expect*?

c Have you ever been in a situation where your expectations caused you to misunderstand something?

Expectation

2a What difference is there between a runway incursion and a runway excursion? What factors do you think increase the risk of a runway excursion?

b **3.01 Listen to the beginning of an account of an approach and landing incident which almost ended in a runway excursion and take notes.**

1 Aircraft type		6 Vertical visibility	
2 Origin of the flight		7 Minimum visibility	
3 Destination		8 Runway in use	
4 Number of passengers		9 Runway length	
5 Number of crew		10 Runway width	

c **What were the flight crew's two expectations which were not met?**

d **What two factors resulted in their expectations not being met?**

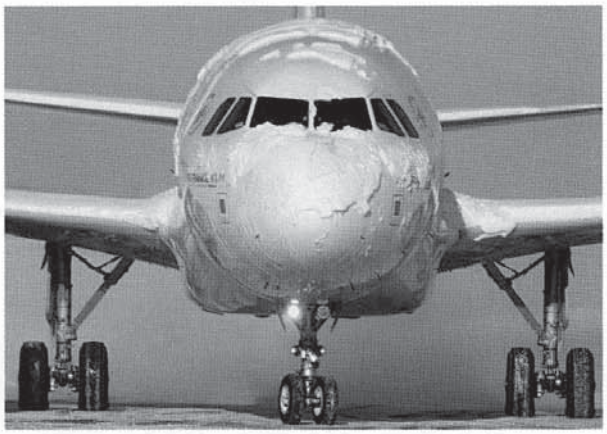
e **Describe the dimensions and characteristics of runways you are familiar with. Focus on your pronunciation and clarity.**

The runway had an available landing distance of 2,569 metres and was 45 metres wide. ...

3a **3.02 Listen to an account of the rest of the approach.** **Student A → p136** **Make notes on the crew action.** **Student B → p144** **Make notes on the environmental conditions. Then take turns to ask and answer questions to complete the missing information in your table and get the full picture.**

b **In pairs, use your notes to tell the story of the incident as it happened step-by-step.**

c **What do you think the main causes of the incident were? What could the flight crew, the Tower and the airport services have done differently to avoid it?**



4a **Match the expectations (1–8) to what actually occurred (a–h) in eight approach and landing situations.**

1 The crew expected snow to be cleared from the runway, but in fact ...
2 The pilot expected to be landing on Runway 21 Right. However, due to a shift in the wind ...
3 Arriving from the north, the crew expected a 210° radial, but ...
4 In Information K, visibility was 1,500 metres, but on arrival ...
5 On departure from Singapore, they had been told not to expect any holding, but ...
6 The controllers had expected a quiet shift, but ...
7 The crew thought they would be visual at 1,500 feet, but ...
8 The crew was used to tracking 220° from Igaba to Krabu, whereas ...

a Approach instructed them to fly 015° from the south.
b on arrival in Kuala Lumpur, they had to hold for 20 minutes.
c at 500 feet they still did not have the runway lights in sight.
d all the traffic was diverted from the neighbouring airport.
e ATC instructed them to track 205° from Oradi to Krabu.
f the airport decided to clear the runway after the A321 landed.
g the crew found that visibility had dropped to 600 metres.
h Runway 34 was in use when he contacted Approach.

b **Say what effect these changes might have on flight crew and controllers.**

5 **3.03** **Listen to ten cues and ask about the availability of various services or aids. Focus on clarity and pronunciation.**

Cue
The full length of the runway

A *Is the full length of the runway available? / Advise take-off distance available.*

6 **Student A → p136** **Student B → p144**
Take turns to communicate expectations and inform of changes in different situations. Your partner will communicate their expectations about various approach data. Use the information you have to inform them of a change in the situation. Stress the important key words. Then change roles.

A *Request ILS approach Runway 26 Right.*
B *Unable, wind 180 at ten knots. Runway in use 19 Left.*

ICAO FOCUS

"Proficient speakers shall 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."

ICAO Doc. 9835 *Manual on the Implementation of ICAO Language Proficiency Requirements*, 4.5.3d, 2nd edition 2010

- **What unexpected turns of events have you experienced during approach operations?**
- **In what ways have you found that unexpected turns of events make communication more challenging?**

Communication errors: An uncorrected erroneous readback

"An uncorrected erroneous readback (known as a hearback error) may lead to a deviation from the assigned altitude or non-compliance with an altitude restriction or with a radar vector."

Flight Safety Foundation *ALAR Tool Kit, 2.3: Pilot-Controller Communication*

7a **Give an example of a typical readback error during approach.**

b **In what circumstances do you think that readback errors are most likely to occur?**

8 **3.04** **Listen to eight controller-pilot communications. In each communication the pilot makes a mistake in his readback, which the controller does not correct. Work in pairs. Student A: act as the controller and correct the pilot. Student B: act as the pilot and read back the corrected information. Then swap roles.**

ATCO *CSA Lines 245, turn right heading 255 to intercept Localizer Runway 24.*
Pilot *Turn right heading 245, intercept Localizer Runway 24, CSA Lines 245.*

A (ATCO) *CSA Lines 245, negative: turn right heading 255, I say again 255 degrees, to intercept Localizer Runway 24. Read back.*
B (Pilot) *Turn right heading 255, intercept Localizer Runway 24, CSA Lines 245*

Expressing concern and making suggestions

LANGUAGE FOCUS: Expressing concern

There are different ways in which you can say you are not happy with a situation:

*I **am concerned about** our radio altimeter reading.*
*I **am worried about** our [fuel] endurance.*
*I **am puzzled by** the heading they are flying.*
*I'**m not sure** he understood.*
*I **thought** we were overhead the field.*
***It's strange** that we haven't got the runway in sight yet.*

9a **3.05 Listen to eight pilot and controller communications where the speaker expresses his/her concern. Match each communication (1–8) to the situation (a–h) which is the reason for the concern.**

a There was a readback error.
b The fuel on board is down to three tonnes.
c The crew is still operating on QNH.
d Holding time has increased to 30 minutes and the apron is congested.
e There is an ATR 72 #1 in the approach.
f Volcan Baru 3,475 m
1 g The VSI readout is showing 2,500 fpm.
h The crew have keyed in the wrong frequency.

b **3.05 Listen again and repeat.**

c **Read the sentences in plain English and decide if *should* means *must*, *probably* or *if*. Imagine the context when you make your decision.**

1 Should the runway not be in sight at Decision Height, I'll call 'go-around'.
2 You should always read back clearances and instructions.
3 Should we change frequency now?
4 We should be crossing the ZUVMU waypoint in five minutes.
5 I should ask for confirmation of our routeing.
6 Should you notice anything unusual, inform me.
7 You should inform me if you notice anything unusual.
8 The forecast is good. You shouldn't encounter any weather.

LANGUAGE FOCUS: *should*

CAUTION: *should* is used in different ways in plain English.

strong recommendation / advice
should = must / is recommended

*You **should** follow Standard Operating Procedures.* (in general)
***Should** we be at 3,000 feet?* (request for confirmation)
*He **should** have requested confirmation.*

probability
should = normally/probably

*You **should** have the runway in sight now.*

conditional
should = if

***Should** you have a doubt, execute a missed approach.*

d **3.05 Listen again. Suggest precautions (things you should do to avoid or mitigate the circumstances) or confirm the information you have received.**

Pilot *I am very concerned about our rate of descent.*
A *We should cross-check with the altimeter reading. / We should use the airbrakes. / You should ease back on the stick.*

10 **Pilots → p153** **ATCOs → p163** **You are working with a colleague. Take turns to express concern about a situation and suggest what to do using *should*. Then change roles.**

ATCO *I'm not sure that it was Aeromexico 562 which responded.*
Colleague *You should ask for confirmation. / You should request a full readback. / You should ask him to read back his full call sign.*

Pilot *I'm worried about the shifting wind direction on Runway 07.*
Colleague *You should request an updated weather report. / You should ask for the latest wind velocity.*

Loss of situational awareness

> **Situational awareness refers to one's ability to accurately perceive what is going on in the cockpit and outside the aircraft ... This awareness should promote on-going questioning, cross-checking and refinement of one's perception. Constant and conscious monitoring of the situation is required.**
>
> Transport Canada, Crew Resource Management

11a In pairs, make a list of the various inputs which enable you to build up situational awareness, for example radar.

b What can cause you to lose situational awareness, for example instrument failure?

12a Complete the sentences (1–10) from an incident report with the words in the box.

deviate	scheduled	vectors	edge	noticed	course (path)	due to
		distracted	descent	initiated		

1 Runway 28 was closed for *scheduled* maintenance.
2 The minimum _____ altitude was 720 feet.
3 The Approach Controller provided radar vectors for the final approach _____.
4 The MD-83 was about five nautical miles from the runway when it began to _____ to the left.
5 This deviation was _____ the flight crew misidentifying the lights of a hotel as those of the runway approach lighting system.
6 The commander became puzzled by the absence of runway _____ lights ahead.
7 The tower controller was _____ by communications with airport maintenance.
8 The controller _____ the aircraft was significantly off track.
9 The aircraft was at 580 feet when the co-pilot _____ the go-around.
10 After considering the wind, the flight crew accepted _____ and completed an ILS approach.

b **3.06 Listen to a report of an incident which occurred in Dublin, Ireland and mark the sentences True (T) or False (F).**

1 The crew expected to land on Runway 34.
2 The crew was cleared to make a VOR DME approach.
3 The aircraft was at an altitude of 1,900 feet at eight nautical miles inbound.
4 The crew confused city lights with the approach lights.
5 The captain was concerned because he did not see the runway lighting.
6 The tower controller had been distracted by the lighting.
7 The aircraft was at 500 feet from the threshold when the crew performed a go-around.
8 The aircraft finally landed safely on Runway 16.

c **In groups, analyse and discuss the various contributing factors which caused this incident. How did the environment, the flight crew and the controller influence the events?**

LANGUAGE FOCUS: *will*

Will is used in different ways. The context of the communication determines the meaning.

Future
Talking about an event in the future:
*You **will/'ll intercept** the Localizer 12 miles from the threshold.*

Conditional
After a conditional usually introduced by *if, when, as soon as*:
*If we are not visual at decision height, we **will/'ll go around.***

Failure (negative)
*Our nose landing gear **will not / won't extend.***

Intention/Undertaking
To express your intention to do something:

ATCO: *Advise your intentions.*
Pilot: *We **will/'ll divert.***

To commit to doing something by giving an undertaking:
*Stand by. I **will/'ll call you back.***
*I **will/'ll make sure** that the emergency services are standing by.*

NOTE: *will* in these cases gives the listener an assurance, especially when you stress the word *will*.

13 **Pilots → p154** **ATCOs → p163** **Take turns to respond appropriately, saying what you will do in certain conditions. Pay attention to clarity and pronunciation.**

Pilot *We have to make an emergency landing on 08.*
ATCO *I'll position you for a ten-mile final ILS Runway 08.*

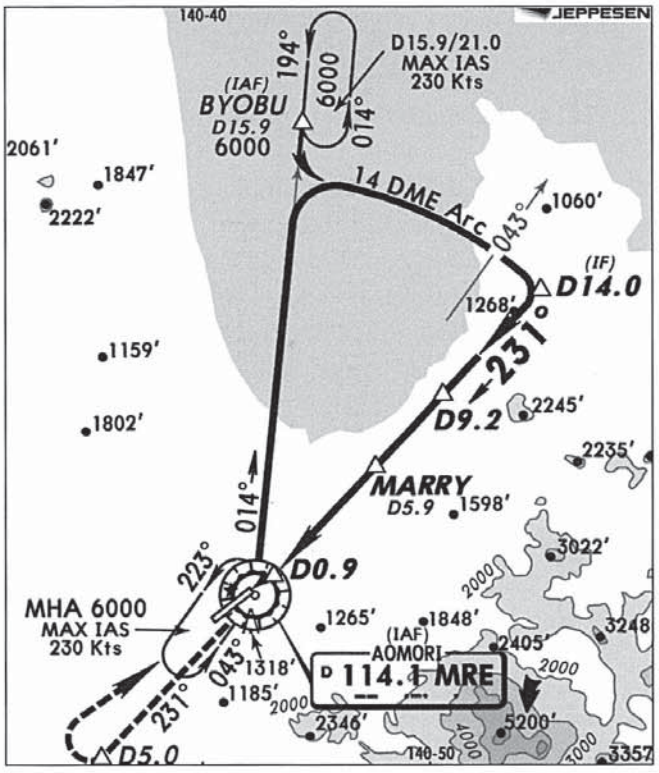
14 **In pairs, prepare pilot-controller transmissions to report the losses and recover the inputs in the scenario below.**

A Korean Air Boeing 737-800 from Seoul is on approach at 11.15 to Aomori (Japan) with 106 passengers and six crew members on board. During the approach, the crew loses various elements of situational awareness.

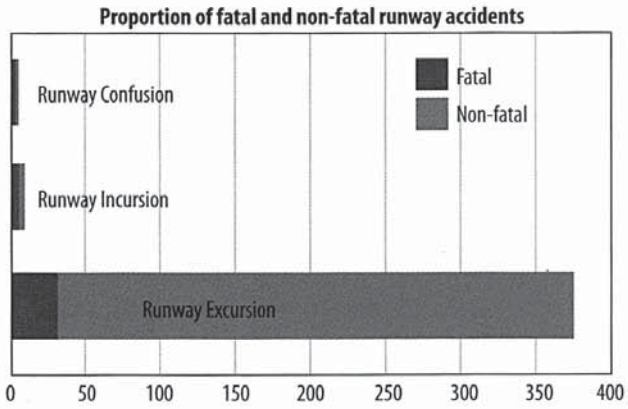
ATCO *Korean Air 767, turn left heading 014°, vectoring for ILS approach Runway 24 ... .*

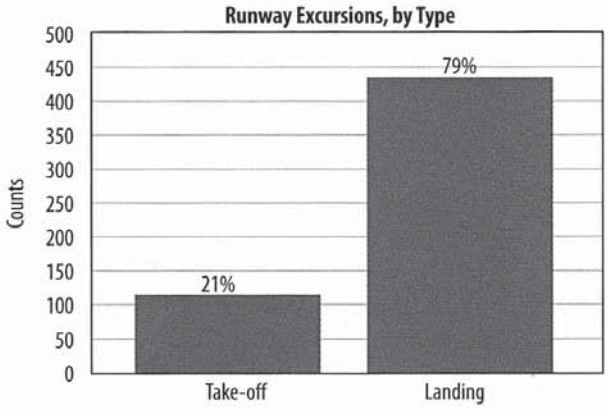
Five miles before turning right onto the 14 DME arc, the crew is unable to pick up the latest ATIS Information Delta from Aomori.

Pilot *Aomori Approach, Korean Air 767, unable receive Information Delta ... .*



Reducing the risk of runway excursions





> During the 14-year period from 1995 through 2008, commercial transport aircraft were involved in a total of 1,429 accidents involving major or substantial damage. Of these, 431 accidents (30%) were runway-related ... The number of runway excursion accidents is more than 40 times the number of runway incursion accidents, and more than 100 times the number of runway confusion accidents.
>
> *Runway Safety Initiative: Reducing the Risk of Runway Excursions*, Flight Safety Foundation, May 2009

15a **Based on your own experience, do any of these figures surprise you?**

b **What is the difference between a runway incursion and a runway confusion?**

c **Why do you think that most runway excursions occur during landing?**

16a **Runway excursion events are typically the result of one or more operational factors and circumstances. Some of these factors relate to controllers, some to pilots and others to the airport authorities. In pairs, mark the factors (1–16) Controllers (C), Pilots (P) or Airport (A).**

1 inadequate directional control *P*
2 failure to allow the aircraft to fly appropriate approach speeds
3 go-around not conducted
4 runways not constructed and maintained to maximise effective friction and drainage
5 failure to select the appropriate runway based on the wind
6 poor crew resource management
7 ineffective braking due to runway contamination
8 failure to provide timely or accurate runway condition information to the crew
9 non-compliance with Standard Operating Procedures
10 approach high
11 failure to provide timely or accurate wind/weather information to the crew
12 poor ATC team coordination
13 incorrect or obscured runway markings
14 touchdown long
15 late runway changes
16 approach fast

b **Make a list of some of the consequences of these factors from either a pilot or controller standpoint. Then make conditional sentences with *will*.**

*If the pilot has inadequate directional control, the aircraft **will** veer off the runway.*
*If the controller fails to allow the aircraft to fly appropriate approach speeds, the aircraft **will** not respect Vref.*

c **Discuss in groups. What do you think is the most immediate solution to many of these conditions?**

17a **3.07 Listen to ten controller and Tower communications about incoming flights, the state of the runway, obstacles or environmental conditions. Relay this information to the crew and give advice about any precautions they should take.**

Tower *Remind all incoming flights that Runway 29 Left is closed for scheduled maintenance. Runway 29 Right is the runway in use.*
A *Be advised. Runway 29 Left is closed for scheduled maintenance. Runway 29 Right is the runway in use.*

b **Pilots → p154** **ATCOs → p163** **Take turns to relay the information you are given to a colleague. Your colleague will ask for confirmation. Use the phrases in the *Relaying information* box.**

ATCO *Runway 15 Left is closed.*
Pilot 1 *They said that Runway 15 Left is closed.*
Pilot 2 *Did you say that Runway 15 Left is closed? / Confirm Runway 15 Left closed.*
Pilot 1 *Affirm*

Pilot *We have 246 passengers on board.*
ATCO 1 *They advised us that they have 246 passengers on board.*
ATCO 2 *Confirm they have 246 passengers on board.*
ATCO 1 *Affirm*

LANGUAGE FOCUS: Relaying information

If you receive information you want to relay or transmit to someone else, use structures such as:

'The surface of Runway 09L is contaminated.'
*Airport Maintenance **says (that)** the surface of Runway 09L **is** contaminated.*

'Remind all incoming flights that the ILS is inoperative.'
***Be advised (that)** the ILS **is** inoperative.*

'Braking action is very poor on Runway 23R.'
*The last flight to land **reported** braking action **was / to be** very poor on Runway 23 Right.*

'Your nose gear is not fully extended.'
*The tower **told** us **(that)** our nose gear **is/was** not fully extended.*

Saying your position

18 **Describe the relative position of the following features in and around an airport you are familiar with:**

- final approach fix
- control tower
- ACC
- ILS transmitters
- runways
- obstacles
- terrain
- radar antenna

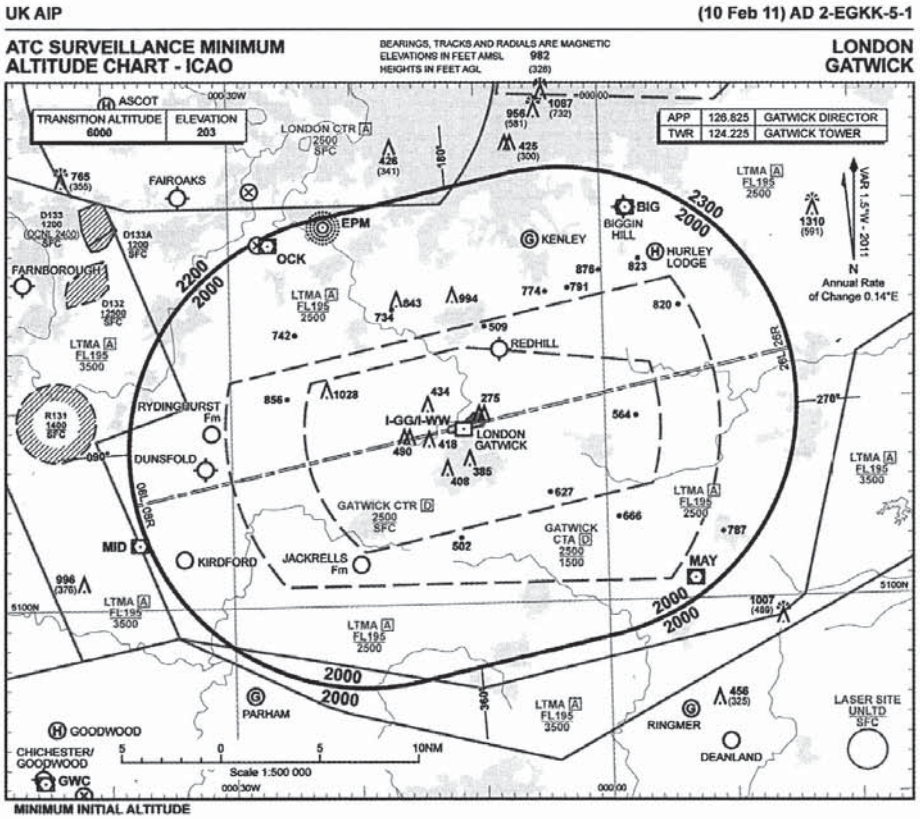
LANGUAGE FOCUS: Distance

*There are five miles **from** the final approach fix **to** the threshold.*
*There are 15 nautical miles **between** Biggin Hill **and** London Gatwick.*
*MID is three nautical miles **to the left of** the extended centreline of Runway 26.*
*Position four nautical miles **inbound to** OCK.*
*LaGuardia is 11 statute miles **from** JFK.*
*We are one dot **above** the glide slope.*
*RWY 08R/26L is 3,316 metres **long**.*

19 **Complete the sentences (1–8) about distances with the words in the box. Use the NATS ATC Surveillance Minimum Altitude Chart for the London Gatwick region.**

from	to the south	outbound	to the north
above	between	long	to the south-west

1 The highest terrain to the west is at 996 feet, three nautical miles *to the south-west* of the MID VOR/DME.
2 Gatwick Centre D is located four nautical miles _____ of London Gatwick airport.
3 The ATC Surveillance Minimum Altitude area ends 17 nautical miles _____ the far end of Runway 26.
4 All elevations are given in feet _____ mean sea level.
5 The ATC Surveillance Minimum Altitude area is 32 nautical miles _____ from east to west.
6 The EPM NDB is three nautical miles _____ from the OCK VOR/DME.
7 There are three nautical miles _____ OCK and EPM.
8 Dunsfold is _____ of the extended centreline of Runway 26.



20 **Pilots → p154** **ATCOs → p163** **Pilots: report the approach and landing problems you have experienced. Controllers: advise the pilot on actions you can take in order to avoid a runway excursion.**

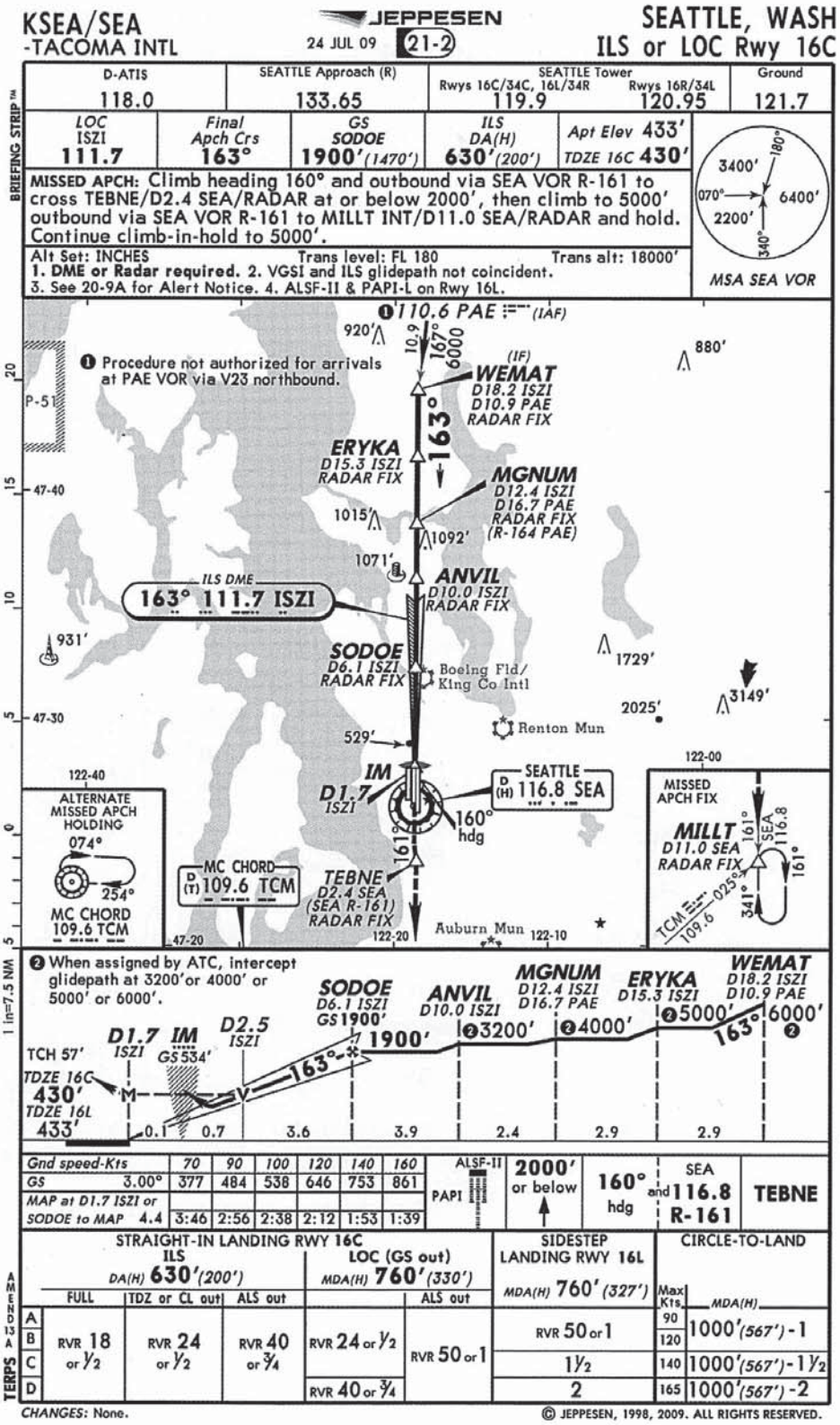
Pilot *We are landing heavy. Request conditions for Runway 13.*
ATCO *Runway 13 available width 34 metres, covered with ice patches, braking action poor, snow along the edges.*

21a Using the Jeppesen Seattle ILS or LOC Runway 16C approach chart as a model, prepare information (Identifier, ATIS, Tower, Ground, LOC, approach course, airport elevation etc.) about an approach you are familiar with.

A *What's the name of your airport?*

B *Seoul Incheon International Airport.*

A *What's its ICAO identifier?*



b Describe the flight path and vertical profile of an approach to your runway and the procedure to follow in the event of a missed approach.

Putting it together: On short final

Preparation

22a **3.08** Listen to ten controller communications about approach and mark the sentences True (T) or False (F).

1 Regional 259 is on short final.
2 Lufthansa 338 has not vacated Runway 07R.
3 The middle section of Runway 28L is contaminated.
4 The last flight experienced a sudden airspeed loss of 20 knots.
5 Ryanair 3548 has confused the runways.
6 Runway 04 has an available length of 2,770 metres.
7 There is a bird strike hazard.
8 BA 375 is approaching too quickly.
9 Braking action will be poor on Runway 28L.
10 Malaysian 428 is too fast.

ICAO FOCUS

"Aim to keep RTF delivery measured, clear and concise, especially when the frequency is congested. But, if it's urgent, sound urgent."

Avoiding communication error: top 10 tips for controllers, NATS

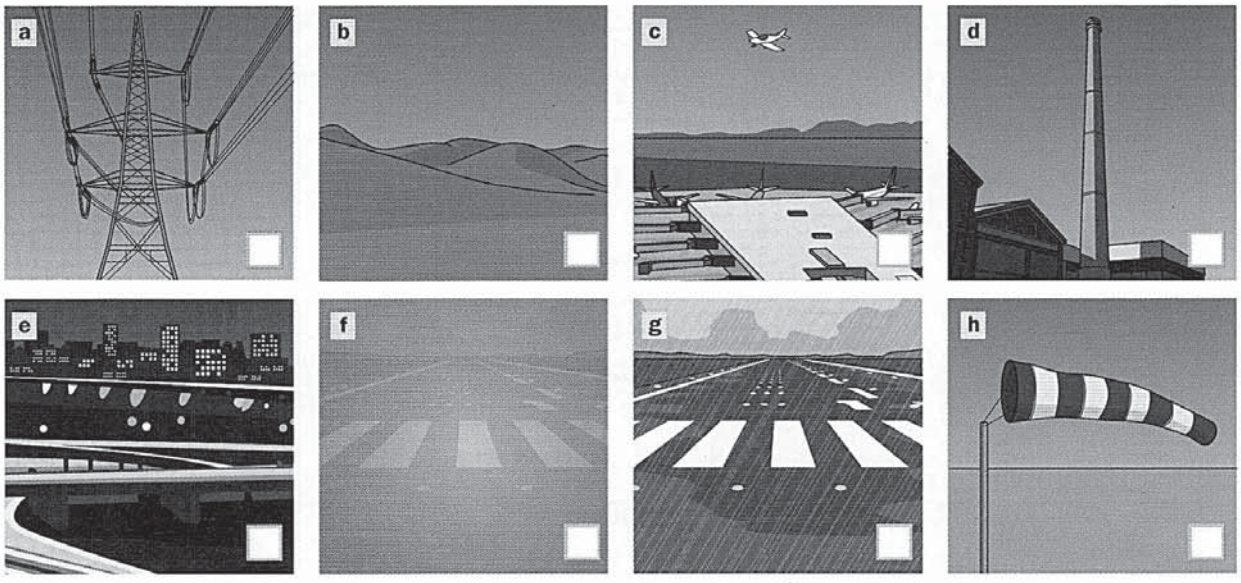
- What do you understand by measured, clear and concise RTF delivery?
- How often have you experienced frequency congestion?
- What sort of situations can be caused by frequency congestion?

b **3.08** Listen again and give appropriate advice or warnings. Use your voice to communicate a sense of urgency.

Regional 259 is two miles from touchdown. An MD-83 has just entered the active runway.

A (ATCO) *Regional 259, pull up and go around.*

23a Look at the pictures (a–h) and say what types of threat or hazard they represent during approach and what precautions should be taken. What would you say to advise an incoming flight of these hazards?



b **3.09** Listen to descriptions of these obstacles and hazards associated with approach and match them to the pictures in Exercise 23a.

24 **Complete the sentences (1–8) with the words in the box. You will use these sentences in the communication activity.**

busy collided past slippery rate of descent passed missed threshold

1 Runway 23L is indicated as *slippery* when wet.
2 The crew _____ the Approach transmission.
3 The crew was _____ resetting the autobrakes and flaps.
4 The aircraft crossed the _____ 80 feet too high.
5 The aircraft had a _____ of 600 feet per minute.
6 The aircraft touched down 1,150 metres _____ the threshold.
7 The aircraft _____ with an ILS antenna.
8 The aircraft _____ the end of the runway at 74 knots.

Communication

25a **Pilots → p154** **ATCOs → p164** **Use the information (*in italics*) and communication cues to perform transmissions during an approach. Focus on fluency. The pilot initiates the communication.**

b **Discuss what mistakes were made and what the crew should have decided to do.**

Debriefing

26 **Report back to the class about the different stages and types of communication in the scenario in Exercise 25a. Did you find that you managed the situation effectively and that your interactions were clear and fluent? Why/Why not?**

Progress check

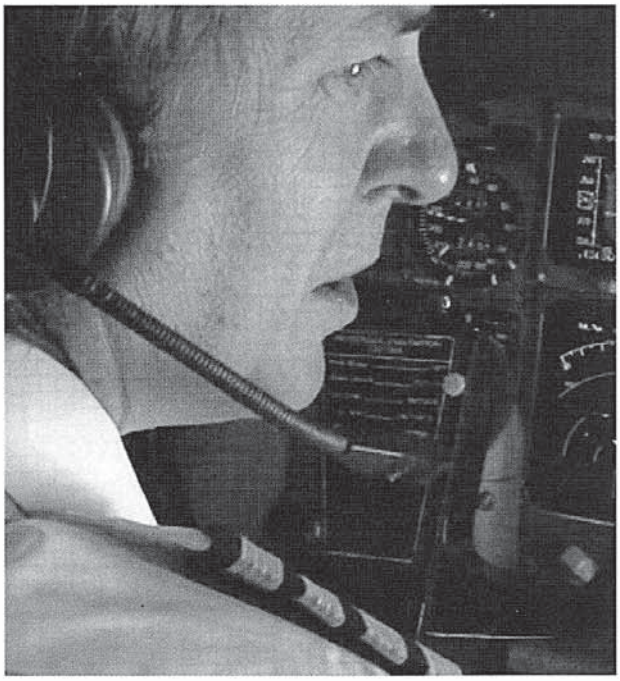
1 **Complete the progress check for this unit. Assess your proficiency in these areas.**
(1 = I need more work on this, 5 = I feel confident in this area)

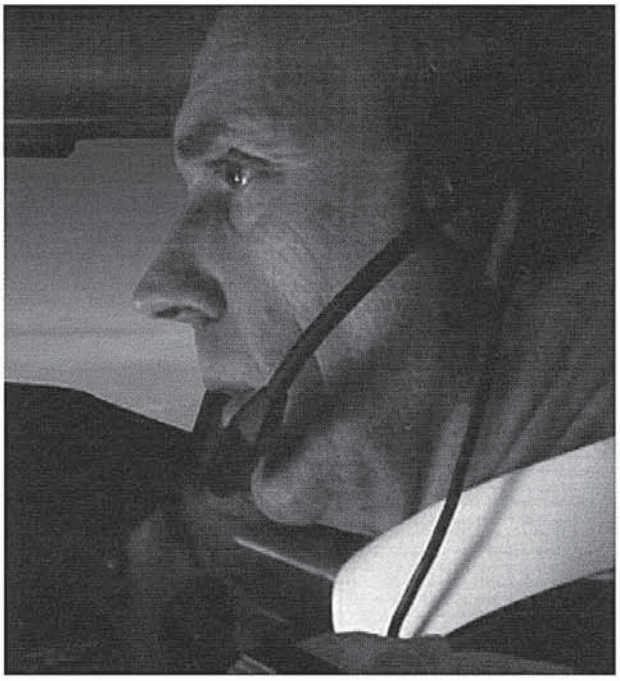
■ I can give advice and make suggestions.	1	2	3	4	5
■ I can check for correctness.	1	2	3	4	5
■ I can correct readback errors and misunderstandings.	1	2	3	4	5
■ I can express concern.	1	2	3	4	5
■ I can describe precautions to be taken.	1	2	3	4	5
■ I can describe distances and relative positions.	1	2	3	4	5
■ I can relay information from one person to another.	1	2	3	4	5
■ I can use my voice to express urgency.	1	2	3	4	5
■ I can manage approach situations in real time.	1	2	3	4	5

2 **Choose three areas of communication from this unit which you are less confident in. Make plans for improving your skills in these three areas.**

DVD Unit 8

Call sign Confusion





27a Watch the Eurocontrol DVD clip *Call sign confusion.* What kind of incident does it show?

b Which of these factors contribute to the incident? Discuss in pairs.

- complacency
- expectation bias
- poor team work
- poor situational awareness
- TCAS malfunction
- similar call signs
- wrong priorities
- radio interference

28a Watch Part 1 (0.00 – 0.38) again. What do you think of the attitude of the ATCO who is taking over?

b In pairs, discuss the effects which this attitude might have on a controller's work.

29a Watch Part 2 again (0.34 – 1.53). What do you notice about the interaction between the Captain and First Officer?

b Describe the traffic which the controller is handling.

c The ATCO says 'One aircraft had just departed, probably a conflict, but I wanted to see how things developed.' Do you think this is the correct decision?

30a Watch Part 3 again (1.53 – 3.55). How has the situation developed on the flight deck? Is the First Officer correct to be concerned about the aircraft's speed?

b What effect does the PA28 have on other air traffic? How could this have been avoided?

c Why does the controller instruct B-Jet3158 to stop descent? What happens next?

31a In pairs, identify the human factors which contributed to this incident.

b Report the incident from beginning to end. What recommendations would you make to reduce the risk of a similar incident?

c Look again at the list of factors in 27b. Do you have experience of factors like these contributing to safety risks? How are these factors managed in your own working context?

UNIT 9
Handling a technical malfunction

COMMUNICATION FUNCTIONS

- Summarising
- Suggesting action
- Communication errors: failure to request clarification
- Announcing a change
- Self-correcting
- Asking and answering about consequences and reasons

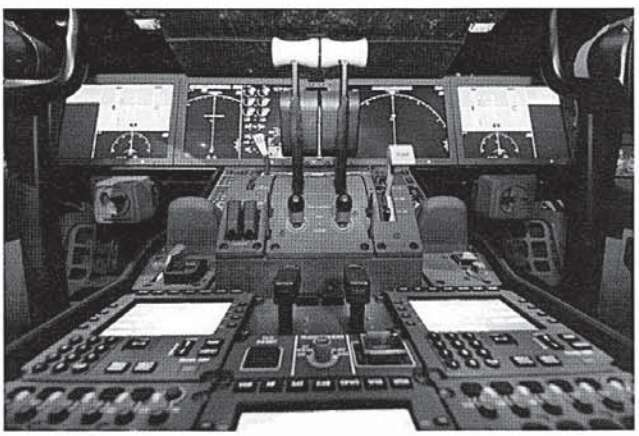
Lead in

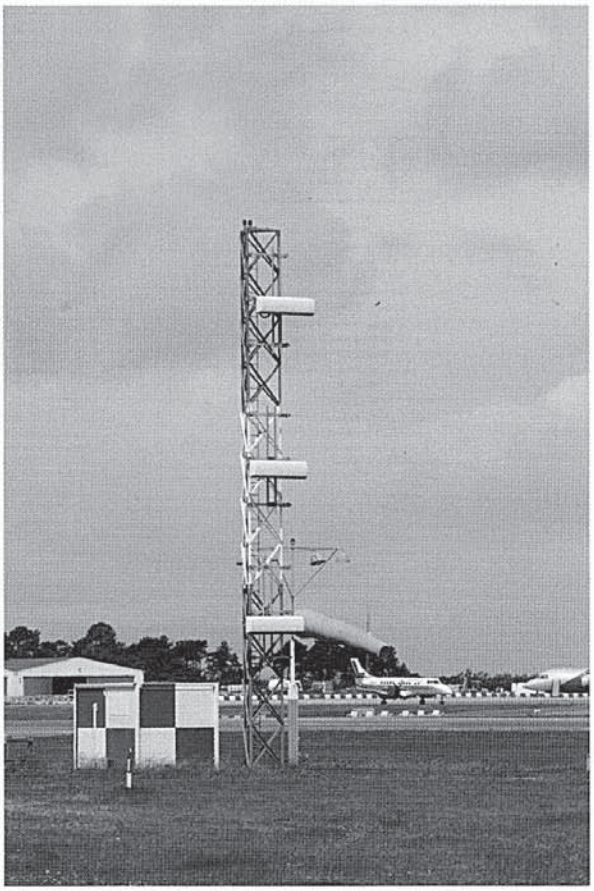
> **An Ethiopian Airlines Boeing 767-300 from Addis Ababa (Ethiopia) to Lagos (Nigeria) with 180 passengers was on approach to Lagos, when the air traffic control's radar and communication radio failed. Unable to obtain a landing clearance, the crew entered a holding [pattern] but eventually had to declare an emergency about two hours later and land in Lagos without landing clearance. The airplane landed safely.**
>
> *Aviation Herald,* 2nd June 2010

1a **What do you think could have caused this failure?**

b **Describe any ATC-related failures you have experienced.**

c **What were the consequences in the air and on the ground?**





d **In pairs, make a list of technical problems which can occur on board an aircraft and which will affect traffic management, for example engine stall or low oil pressure. Then compare your lists in groups.**

Reporting system failures

2a **Look at the aircraft failures and the systems that they relate to (1–6) in the table below. In which systems would you find the 13 failures (a–m)?**

1 Engines	2 Electrical power	3 Flight controls	4 Fuel	5 Navigation	6 Pressurisation and air conditioning
Compressor stall	*IDG disconnect*	*Aileron Power Control Unit*	*Tank low pressure*	*Spurious INS warning*	*Outflow valve jammed open*

a stabiliser trim runaway *3*
b flame-out
c GEN 1 overload
d cross-feed valve jammed
e flow control valve stuck closed
f flap asymmetry
g pack controller
h altimeter discrepancies
i Air Data Computer failure
j filter clog
k AC bus 1 fault
l DME 1 failure
m leak

b **What aircraft technical failures have you encountered as a pilot or controller?**

c **Describe the effects these aircraft failures had on the flight and traffic management.**

LANGUAGE FOCUS: Technical conditions

*The cable could be **broken**.*
*The filter may be **clogged**.*
*The windshield is **cracked**.*
*The situation is **dangerous**.*
*The autopilot is **disconnected**.*
*The oil pressure is **dropping**.*
*The tanks are almost **empty**.*
*The transmission was **garbled**.*
*The oil temperature is too **high**.*
*The indication is **intermittent**.*
*The slats are **jammed** retracted.*
*The hydraulic reservoir is **leaking**.*
*The lever is **locked**.*
*The oil level is **low**.*
*Part of the wing tip is **missing**.*
*The Localizer is **unserviceable**.*

3a **Complete the sentences using words from the *Technical conditions* box. For each sentence, more than one word may be correct.**

1 The flaps are *jammed/locked*. We cannot extend them beyond 25 degrees.
2 The autothrust is _____.
3 The mechanics reported two static dischargers _____ at our last turnaround.
4 The outer tanks are _____.
5 Your message was _____. Say again.
6 The cabin altitude is too _____. We need to make an emergency descent.
7 The APU is _____.
8 The line was _____ – six drops a minute at our last stop.

b **Which of the failures in each group does not belong? Choose the correct answers and explain why.**

1 leaking – clogged – cracked – seepage – overflow – surge
2 smoke – over-temperature – fire – missing – overheat – burnt
3 transient – loose – de-energised – over voltage – short-circuit – grounded
4 locked – seized – stuck – jammed – tight – loss
5 saturated – congested – garbled – noise – contaminated – humming
6 worn – stall – ruptured – cracked – broken – scratched

4a **3.10 Listen to eight flight crew transmissions. For each message, summarise the situation to make sure you have understood correctly.**

Pilot *We seem to have a flap system failure.*
A (ATCO) *So, you have a problem with the flight controls and the flaps are probably jammed.*

b **Pilots → p155** **ATCOs → p164** **Take turns to report technical conditions on the ground or inflight and explain briefly what consequences they may have. Your partner will ask you for further information.**

ATCO *The glideslope is unserviceable. ILS approach not available.*
Pilot *How long will the glideslope be unserviceable? / What type of approach will we be able to make?*

Pilot *We have a cabin pressurisation fault. Unable to accept a higher level.*
ATCO *What level is acceptable to you?*

Consequences of system failures

LANGUAGE FOCUS: Consequences

Look at how the flight crew might discuss the consequences of a failure:

If *the pressurisation leak continues,* ***we'll [we will] have to*** *request a lower level.*
In the event of *an engine failure,* ***we'll*** *turn back.*
We're above our Maximum Landing Weight, ***so we'll have to*** *dump fuel.*
As/Since *we are above our Maximum Landing Weight,* ***we'll have to*** *dump fuel.*
We cannot maintain our present level. ***As a result,*** *we'll divert.*
We have lost one hydraulic system. ***Therefore we'll have*** *limited braking capability.*

5a **3.11** **Match the beginnings of the crew communications (1–8) to the endings (a–h) to describe the consequences of system failures. Then listen and check.**

1 If we lose that hydraulic system, ...
2 As the yaw damper has failed, we are experiencing ...
3 In the event of cabin depressurisation ...
4 Since Engine Number 2 has been shut down, ...
5 The autopilot and autothrust have disconnected, ...
6 We have lost one main electrical generation, ...
7 There is a Captain Probes warning, ...
8 We have a Gear-not-downlocked message. ...

a the oxygen masks will drop down.
b so I will fly the approach manually.
c so my instruments are supplied by the standby probes.
d a lot of Dutch roll and the passengers are uncomfortable.
e therefore I am starting the APU.
f I am opening the cross feed valve.
g we will not have autobraking.
h As a result, I am requesting a low pass.

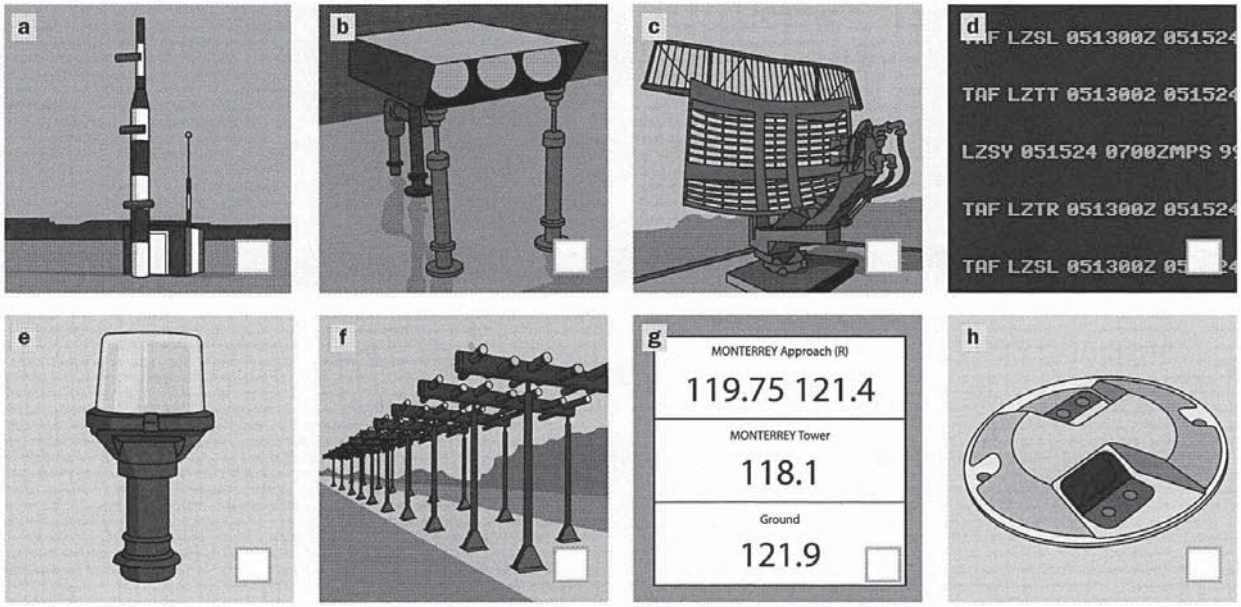
b **3.11** **Listen again and repeat the sentences. Remember to add natural pauses.**

6 **3.12** **Pilots** **Listen to these reported failures and what happened as a result. Imagine that you are talking with your colleague and verbalise all the consequences of the failures.**

Pilot 1 *We seem to have a flap system failure and are unable to extend the flaps for landing.*

Pilot 2 ***As*** *the flaps are jammed,* ***we'll have to*** *make a flaps-up landing.* ***So,*** *the touchdown speed* ***will be*** *higher and the stopping distance longer. We'll* ***need*** *the longest runway and* ***we must also request*** *emergency services to be on alert.*

7a **3.13** **ATCOs** Listen to eight controller transmissions. Match each transmission (1–8) to the unserviceable ATC and navaid equipment shown in the pictures (a–h).



b In pairs; describe an ATC navaid or airport infrastructure failure you have experienced, the consequences it had and the action which was taken.

Communication errors: Failure to request clarification

8a **3.14** Listen to ten controller transmissions. The information they contain may be incomplete or unclear. Ask questions in order to clarify the speaker's intention.

ATCO *This will be a surveillance radar approach to the runway in use.*
A (Pilot) *Which runway is in use? / Advise runway in use.*

b **Student A → p136** **Student B → p144** Take turns to develop the dialogues from Exercise 8a. Pilots: request clarification. Controllers: provide additional information or clarification.

A (ATCO) *This will be a surveillance radar approach to the runway in use.*
B (Pilot) *Which runway is in use? / Advise runway in use.*
A *Runway 33 Right is the runway in use.*

ICAO FOCUS

"Reluctance to seek confirmation may cause flight crews to either:

- *accept an inadequate instruction (over-reliance on ATC); or*
- *determine for themselves the most probable interpretation.*

Failing to request clarification may cause a flight crew to believe erroneously that they have received an expected clearance."

Flight Safety Foundation, *ALAR Briefing Note 2.3*

- Why do you think flight crews may not wish to ask for clarification?
- What might an inadequate instruction be?
- What is wrong with making your own interpretation?
- What are the hazards associated with thinking, incorrectly, that you have been cleared?

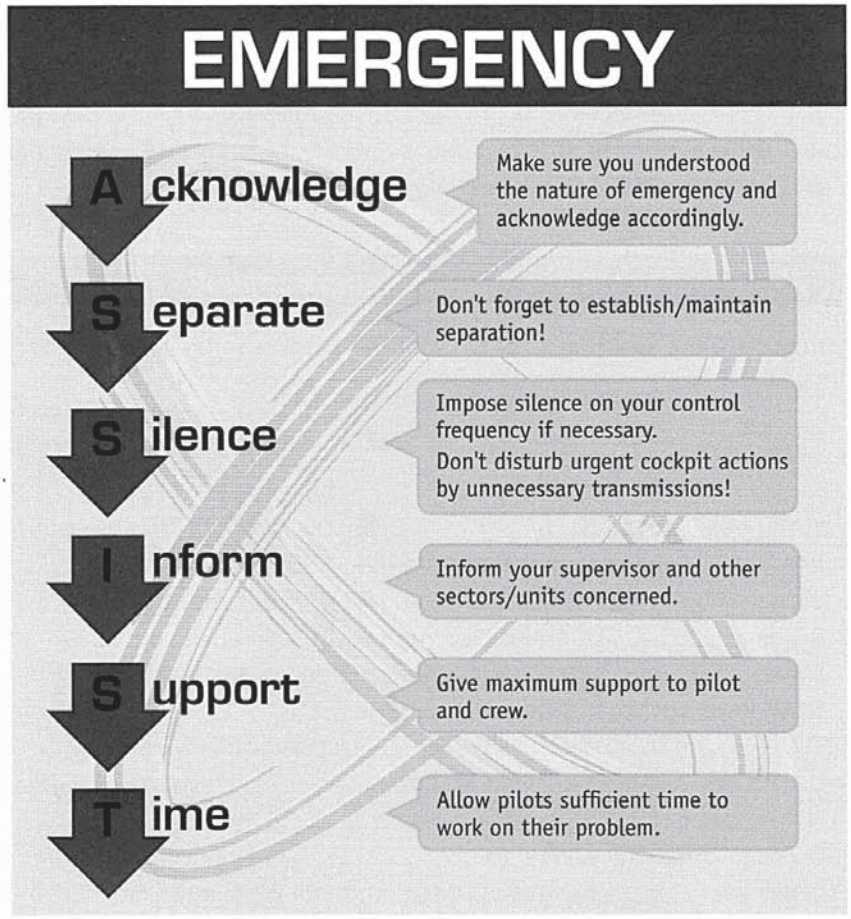
Controller response to aircraft system failures

9a **If you are a controller, give an example and explain the importance of each part of *ASSIST*. If you are a pilot, say why you expect these things of a controller in the event of an emergency and give examples of what is most useful. In your experience, have you always found that these steps are taken?**

b **3.15 Listen to a pilot-controller communication and say what is happening.**

c **In pairs, rank the eight emergency situations (a–h) in order of seriousness. Then compare in groups.**

a birdstrike
b a bomb warning
c depressurisation
d hydraulic problems
e fuel problems
f gear problems
g unlawful interference
h smoke or fire in the cockpit



Eurocontrol, *Guidelines for Controller training in the handling of unusual/emergency situations*

d **Match the emergency situations (a–h) in Exercise 9c to the sets of possible consequences (1–8).**

1 ◆ Squawk 7500 ◆ Course/level deviations ◆ No/unusual replies to RTF ◆ No compliance with instructions	**5** ◆ High stress level in cockpit ◆ Shortest high-speed vector to land ◆ Poor RTF (oxygen mask) ◆ Passenger evacuation
2 ◆ Go-around ◆ Low pass of tower ◆ Manual gear extension	**6** ◆ Broken windshield ◆ Engine malfunction ◆ Precautionary approach
3 ◆ Aircraft may stop climb ◆ Request for immediate re-clearance ◆ Landing at next suitable aerodrome ◆ A/C early in landing configuration	**7** ◆ Limited flap setting ◆ Manual gear extension ◆ Higher approach speed ◆ Limited braking capability
4 ◆ MAYDAY low-on-fuel emergency ◆ Aircraft priority handling ◆ Improper use of phraseology	**8** ◆ Emergency descent without warning ◆ No emergency squawk ◆ Poor RTF (oxygen mask) ◆ Injuries

10a **Why do these emergency situations have these consequences?**

b **3.16 Listen to eight pilot transmissions about emergency situations. Match the transmissions to the situations in Exercise 9c.**

11 **Student A → p137** **Student B → p145** **Take turns to inform of failures, emergencies or unusual situations. Make any appropriate requests and say if the situation is changing. Your partner will ask about the consequences of the failure.**

A *We have just had a left fuel tank pump failure.*
B *What effect will the failure have on your flight? / How will this affect your flight?*
A *For the moment, the situation is under control and we can continue in the hold normally.*
B *Advise us if the situation changes.*

Electrical problems approaching Bangkok

12 **Complete the sentences (1–12) with the phrasal verbs in the box.**

lifted off look after looking for make up pass on pull up print out
put out read back running away running out of ran up

1 You can *print out* a copy of the post-flight report from the centre pedestal.
2 Will you make sure that there are medical personnel to _____ the evacuated passengers?
3 The Embraer was _____ fuel and declared an emergency.
4 I am _____ the Akita ILS Runway 28 approach chart. Have you seen it?
5 We _____ 600 metres before the end of the runway.
6 We have successfully _____ the fire.
7 Make sure that pilots always _____ all your clearances.
8 With the 120-knot tailwind we hope to _____ some of the delay.
9 If we are not visual at minima, I'll _____ and go around.
10 The EGT reading seems to be _____. We'll have to retard the thrust lever.
11 Will you _____ this information to our company Dispatch?
12 The engineers _____ the engine after the Quick Engine Change.

13 **3.17** **Listen to a report of an in-flight incident on a Boeing 747.** **Student A → p137** **Make notes about the circumstances of the flight.** **Student B → p145** **Make notes about the consequences. Then take turns to ask and answer questions to complete the missing information in your table.**

14 **3.18** **Listen to ten reports of events during the Boeing 747's approach to Bangkok. For each event, say what the cabin or flight crew actually said. Notice the difference between past and present information.**

The customer service manager notified the flight crew that a substantial water leak had occurred in the forward galley.

A *A substantial/large water leak has occurred in the forward galley.*

15a **In pairs, write a scenario of the communications between the flight crew and the controller during this incident.**

b **Role play your scenario.**

Monitoring a situation and announcing a change

ICAO FOCUS

"*Sharing information*

- *Request a detailed description.*
- *Ask about possible consequences of an event.*
- *Describe a changed state.*
- *Describe the source of a problem.*
- *Announce a problem.*
- *State possible consequences of an action/ event.*
- *Announce a change.*"

ICAO Doc. 9835, *Manual on the Implementation of ICAO Language Proficiency Requirements*, Appendix B 2.1–2.3, 2nd edition, 2010

Give examples of the following:

Someone ...

- requesting a detailed description, e.g. *Can you give us an update on the situation?*
- asking about consequences, e.g. *What effect will the loss of the generator have?*
- describing a changed state, e.g. *The oil pressure has dropped.*
- describing the source of a problem, e.g. *The hydraulic leak has caused our autobrake system to be downgraded.*
- announcing a problem, e.g. *The First Officer has lost all his display units.*
- stating possible consequences, e.g. *If the failure continues, we will have to divert.*
- announcing a change, e.g. *The altitude indications have stabilised.*

16a **Match the descriptions of monitoring actions (1–8) to the announcements of change (a–h).**

1 We are watching the engine parameters.
2 We are monitoring the Vertical Speed Indicator.
3 All the left-hand display units are blank.
4 We are showing two dots above the glideslope.
5 The PNF is monitoring the frequency.
6 Cabin altitude is still within tolerance.
7 Rudder deflection appears to be normal.
8 We are trying to recycle the landing gear.

a The Flight Officer has recovered his PFD and ND.
b Yaw control is no longer responding.
c The controller's last transmission was in Russian.
d The oxygen masks have been released.
e N1, N2 and EGT have dropped.
f The approach is now stabilised.
g All gears have extended and locked down.
h The rate of descent has increased to 1,600 feet per minute.

b **Describe what is happening in each of the eight cases.**

c **Work in pairs. Take turns to describe a technical incident you have experienced on the flight deck or in the control centre, and how it evolved.**

17 **Complete the sentences (1–10) with the words in the box.**

so	by	if	and	but
unless	until	then	for	to

1 The Flight Officer's display units are blank, ___*but*___ the captain's seem to be operating normally.
2 Maintain present altitude _____ reaching BONA.
3 Fly direct to BONA _____ commence your descent.
4 Advise me _____ the situation deteriorates.
5 We need to reduce our landing weight _____ jettisoning ten tonnes of fuel.
6 We need to stay at an upper level as long as possible _____ save fuel.
7 We'll have to make a flapless landing, _____ we'll need the longest runway.
8 We have shut down the engine _____ discharged the fire extinguisher.
9 We'll have to divert _____ I can relight the engine.
10 Cabin crew, take your stations _____ landing.

LANGUAGE FOCUS: Linking words

Notice how these function words may be used by the flight crew communicating together:

*We are not sure of gear extension **so** we will make a low pass.*
*We'll make sure our gear is correctly extended **by** making a low pass.*
*We will make a low pass **(in order) to** make sure our gear is correctly extended.*
***If** we are not visual at our minima, we'll make a missed approach and divert to our alternate.*
*We'll don our masks **and** perform the smoke drill.*
*We'll have to divert **unless** the visibility improves.*
*We'll hold **until** we get clearance.*
*Perform the fire drill, **then** advise ATC.*
*Fasten your seat belts **for** landing.*

18 **Student A → p137** **Student B → p145** **Take turns to give information and self-correct. You will give information to your partner and they will question this information. You will then correct yourself. Stress the corrected word.**

A *Our autopilot has disconnected.*
B *Confirm your autopilot has disconnected. / Did you say your autopilot has disconnected?*
A *Correction: our autothrust has disconnected.*

19a **3.19** **Listen and choose the word you hear.**

1 full / fuel	4 loose / lose	7 loss / lost	10 clear / clean
2 lift / list	5 four / far	8 wait / way	
3 damper / dumper	6 least / last	9 worn / warm	

b **Practise saying each pair of words.**

20a **Pilots → p155** **ATCOs → p164** **The pilot will announce a changing technical problem. The controller will respond to any requests and ask the pilot to give updates on the situation on board. The pilot will provide new information periodically. Controllers take notes and, if required, ask for any clarification or about the consequences of the changed situation.**

Pilot *Bahrain ACC, Gulfair 571. We are an A320 descending to Flight Level 290 en route to Dubai. We have just had an AC Bus failure and are requesting a lower level to be able to start our APU, Gulfair 571.*
ATCO *Gulfair 571, roger. Descend and maintain FL 190.*
Pilot *Descend and maintain Flight Level 190. Thank you, Gulfair 571.*

b **In pairs, use your notes to make a report to your supervisor or debrief the situation after landing.**

Putting it together: ILS system failure

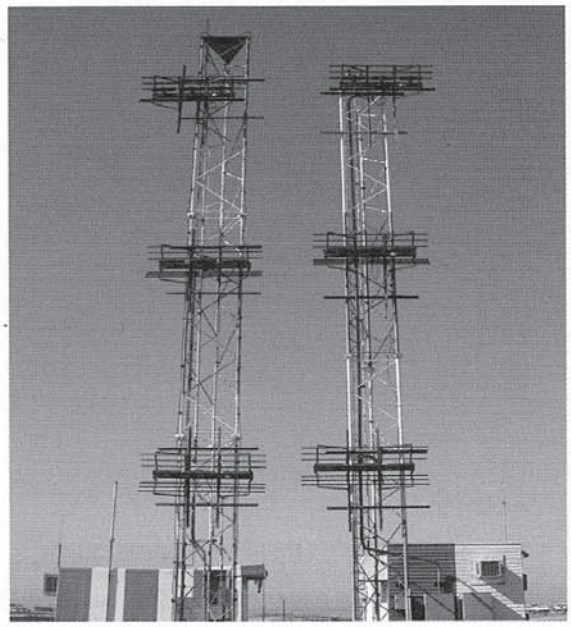
21a How can you recognise the Localizer and Glideslope antennas?

b Describe the operation of the ILS system (LOC, LLZ and G/S) in your own words.

Preparation

LANGUAGE FOCUS: Requesting and giving reasons

Why *did you go around?*
Because *there was a DME / altitude information discrepancy.*
We went around ***because of*** *a discrepancy in the DME / altitude information.*
What was the reason for *the faulty ILS indication?*
It was ***due to*** *the fact that the transmitter was in the bypass mode.*
The transmitter in bypass mode ***caused*** *the indication.*



22 **3.20 Work in pairs. Listen to ten pilot communications. For each one, ask for the reason. Your partner will say why. Pay attention to the tense used and respond accordingly.**

Pilot *The windshield cracked a few moments ago.*
B (ATCO) *Why did the windshield crack? / What caused the windshield to crack?*
A (Pilot) *We went through a hailstorm.*

Pilot *We made a go-around.*
A (ATCO) *Why did you go around?*
B (Pilot) *Because there was traffic crossing the runway.*

23a **3.21 Listen to an account of an incident which occurred on Air New Zealand Flight NZ 60 and mark the statements True (T) or False (F).**

1 NZ 60 was a B767 aircraft.
2 There were 175 passengers on board.
3 The flight was cleared to Faleolo via FALE.
4 The aircraft flew a 15 nautical mile arc for ILS Runway 08.
5 The aircraft captured the glide path, then the Localizer.
6 The rate of descent increased soon after glide path capture.
7 The PNF was surprised by the visual references outside the aircraft.
8 A missed approach was performed 400 feet from the runway threshold.

b **Summarise the events. What reasons can you think of to explain these events?**

24a **3.22 Listen to the second part of the account of the incident which occurred on Air New Zealand Flight NZ 60 and complete the sentences. Choose the correct answers.**

1 The Localizer beam front course was _____ degrees.
a 30 b 40 c 60

2 The aircraft was receiving _____ glideslope deviation signal.
a no b one c a zero

3 The aircraft was descending on a _____ degree slope.
a 3.5 b 3 c 5.5

4 The aircraft was descending to a point 5.5 nautical miles _____ the runway.
a to the left of b beyond c short of

5 The ILS glideslope transmitter had _____.
a been set unintentionally in the bypass mode
b been set intentionally in the bypass mode
c failed

6 The glideslope guidance information was _____.
a missing b out of phase c incorrect

7 The flight crew was _____.
a fortunate b well trained
c well trained and worked well as a team

8 The crew reacted _____.
a appropriately and quickly
b quickly c without thinking

b **Summarise: 1) the reasons for this incident; 2) why the 3.5° glideslope was dangerous and 3) the crew's response.**

Communication

25a **Student A → p137** **Student B → p145** **Student A will debrief Student B on the actual flight path of NZ 60. Student B will describe the planned flight path at each altitude and time, and say what the aircraft should have done. Note the information on your chart.**

A *They captured the Localizer at 3,000 feet (sec. 26) and extended the flaps to position one, eight seconds later. They captured the glideslope almost immediately (sec. 33) at 2,800 feet.*

B *They should have captured the glideslope over a minute and a half later (sec. 136) at 2,500 feet.*

b **Compare your completed charts and correct any errors.**

Debriefing

26 **Report back to the class about your communication and the accuracy of the information transmitted. Did you find that your interactions were effective, clear and fluent? Why/Why not?**

Progress check

1 Complete the progress check for this unit. Assess your proficiency in these areas.
(1 = I need more work on this, 5 = I feel confident in this area)

■ I can report system failures and unusual situations.	1	2	3	4	5
■ I can request and describe the consequences of technical problems.	1	2	3	4	5
■ I can recommend what action should be taken.	1	2	3	4	5
■ I can request and give clarification about a situation.	1	2	3	4	5
■ I can announce a change in a situation.	1	2	3	4	5
■ I can correct myself.	1	2	3	4	5
■ I can request and give reasons.	1	2	3	4	5
■ I can debrief a sequence of past events.	1	2	3	4	5

2 Choose three areas of communication from this unit which you are less confident in. Make plans for improving your skills in these three areas.

DVD Unit 9

NZ 60: A free lesson (Part 1)

Air New Zealand Flight 060, a Boeing 767, is making an ILS approach to Runway 08 at Apia in the Samoan Islands on a moonless night with scattered cloud. As the clip begins, the aircraft has just captured the Localizer.

27a **Watch Part 1 of the clip (0.00 – 2.06) and answer the questions.**

1 What did the pilot say happened 'suddenly'?
2 What did the ILS readings show?
3 What were the crew occupied with?
4 What did the crew do to reduce speed?

b **Watch Part 1 again and take notes about the details of the incident. Then discuss in pairs.**

1 What did the crew think was causing the excessive speed?
2 What other causes might be responsible, in your view?
3 What might happen next?

28a **Watch Part 2 of the clip (2.07 – 4.45) to find out what happened next.**

b **Describe in pairs the sequence of events which led to the decision to go around. What factors were the most important in reaching the decision?**

c **Watch Part 2 again to check. What do you think happened next?**

d **Read the account of what happened, and the investigation which followed.**

Once they had stabilised the aircraft at a higher altitude, the crew discussed the situation and suspected that the glideslope for Runway 08 was giving false information. They planned a second approach using the Localizer but ignoring the on-glidepath indication. They landed the aircraft safely.

Analysis showed no faults with the on-board systems, but a fault with the glideslope transmitter, as the crew had suspected. The incident investigation revealed not only what technical errors can be present in the ILS, but also how good crew performance can trap these errors and prevent an accident.

e **In what ways did 'good crew performance' trap errors and prevent an accident on Flight NZ 60?**

UNIT 10
Reducing approach and landing risks

COMMUNICATION FUNCTIONS

- Saying unable
- Announcing a compulsory action
- Announcing a (nearly) completed action and an avoided problem
- Communication errors: expectation bias (2)
- Reporting a previous communication
- Describing procedures

Lead in

> **A Fokker F100 on approach ... is level at 4,000 feet QNH on a track to intercept the ILS Localizer and is in contact with the Approach Controller. [In the opposite direction], a VFR traffic, non-TCAS equipped, is also level at 4,000 feet QNH and is in contact with another controller. There has been no coordination between the two controllers.**
>
> Eurocontrol, *ACAS Bulletin 9*

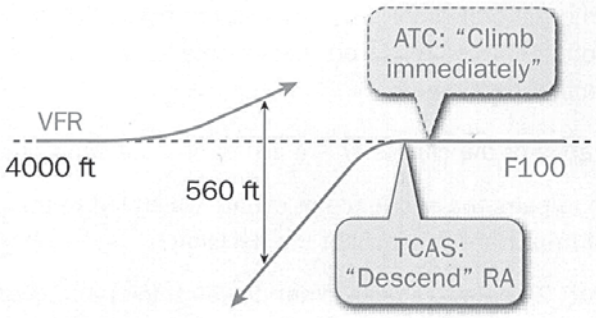
1a **What do you think will happen? How will the controllers react?**

b **How does TCAS operate?**

c **Describe your experience of a TCAS incident as a pilot or controller.**

Avoiding action

2a **3.23 Listen to the rest of the Eurocontrol report in Exercise 1 and complete the notes in the table below.**



1 Approach Controller's instruction:		5 VFR pilot actions:	
2 TCAS order:		6 Result of VFR pilot action:	
3 TCAS RA before or after ATC instruction?		7 Minimum separation between aircraft:	
4 F100 pilot action:		8 Separation if F100 had followed ATC instructions:	

b **Why did the F100 pilot disregard the Approach Controller's instruction?**

c **Report the events in this incident in your own words.**

3a **Match the figures (a–f) to the data (1–6) published by Eurocontrol about TCAS II.**

1 The vertical miss distance above 20,000 feet (in feet)	a 7.1
2 The vertical speed (in feet per minute) required by the Climb and Descend RAs	b 1,000
3 The factor of collision risk reduction thanks to TCAS II in the operational world	c 5
4 The vertical miss distance at low altitudes in feet	d 300
5 The latest new TCAS II version	e 600
6 The average number of flight hours between RAs on short- and medium-haul aircraft	f 1,500

b **In groups, compare your answers.**

c **What conclusions can you draw from these statistics?**

4 **Complete the sentences (1–12) with the phrasal verbs in the box.**

shut down	shut off	speak up	start up	switch off	switch over
take off	take over	touch down	turn back	turn up	turn off

1 We will *touch down* on Runway 27R in two minutes.
2 With one engine out we will have to _____ to our airport of departure.
3 I'll be handling the radio and the captain will _____ the controls.
4 The visibility is poor with the low cloud. Can you _____ the runway lights?
5 After the compressor failure we had to _____ the engine.
6 Sorry about the delay, ladies and gentlemen. We are taxiing out now to _____ heading east.
7 We _____ the fuel supply and contained the failure.
8 _____ to 118.25.
9 Have we got approval to _____ and taxi?
10 We should _____ Runway 31R at exit B2.
11 I can't hear you very well. Can you _____?
12 The ambient lighting makes it difficult to see the instruments. Can you _____ the dome light, please?

5a **3.24 Pilots inform controllers that they are unable to follow an instruction if it conflicts with a TCAS RA. There are also other circumstances in which they are unable to comply. Listen to eight instructions and reasons for not complying. Make notes about the instructions and the reason why compliance is not possible.**

b **3.24 Work in pairs. Listen again and repeat the controller-pilot exchanges. Focus on pronunciation and clarity.**

A *Climb immediately.*
B *Unable, TCAS RA.*

c **Pilots → p155** **ATCOs → p164** **Take turns to give instructions and refuse using *unable*.**

ATCO *Cleared ILS approach Runway 21 Right.*
Pilot *Unable. We have a hydraulic fault. Request ten minutes to hold over MSA to carry out checklists.*

Pilot *Request ILS approach Runway 26 Right.*
ATCO *Unable. Runway 26 Right is being used for departures. Cleared ILS approach Runway 26 Left.*

Announcing completed actions and avoided problems

LANGUAGE FOCUS: Announcing what has happened

completed actions

We have deployed the emergency services.
We have extinguished the fire.
We have (almost/nearly) completed the evacuation.

avoided problems

We have turned to avoid the thunderstorm.
We have prevented the unruly passenger from harming anyone.
We have managed to stop the fire from spreading.
We have recovered from the stall.

6 **3.25 Listen to ten transmissions from the flight crew enquiring about actions on the ground. For each transmission, reply saying that the action has been completed.**

Pilot *Has the foam carpet been deployed yet?*
A (ATCO) *Affirm. Foam carpet deployed. / Yes, we have deployed the foam carpet.*

7a **3.26 Listen to eight controller transmissions about in-flight problems. For each enquiry, reply saying that the problem has been solved satisfactorily and a threat avoided.**

ATCO *Is the passenger still threatening the cabin crew?*
A (Pilot) *Negative. Passenger restrained. / Negative, the passenger is under control.*

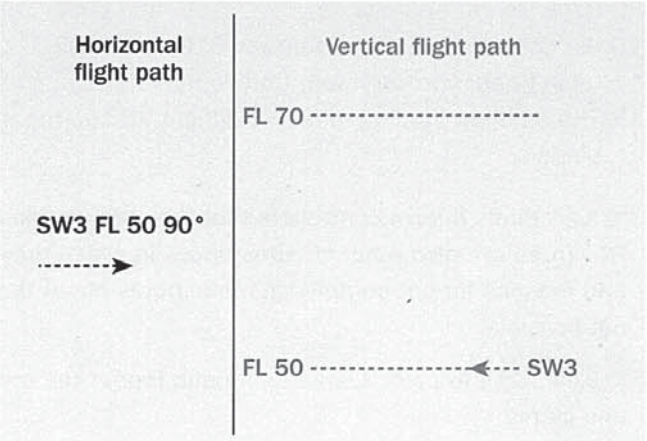
b **3.26 Listen again and practise repeating the questions with a rising intonation.**

Is the passenger still threatening the cabin crew?

8a **3.27 Listen to a report of an ACAS incident and complete the horizontal and vertical paths in the diagram.**

b **3.27 Listen again and complete the notes about the incident.**

1 Aircraft type heading 185°: _____
2 Flying conditions: _____
3 B737 instructed to descend to FL: _____
4 B737 pilot receives a _____ RA
5 Both aircraft: _____
6 Second TCAS RA: _____
7 New TCAS conflict with: _____
8 Should B737 pilot have obeyed the TCAS or controller? _____



c **Pilots As the pilot of the B737 or the ATR 72, summarise the different steps and the details of the incident using the diagram and notes.**

d **ATCOs As controller, report this incident to your supervisor.**

9 **Pilots → p156 ATCOs → p165 Conduct the communication between pilot and controller. The controller initiates the exchange.**

ATCO *Springbok 3571, report level.*
Pilot *Nairobi Approach, Springbok 3571 maintaining altitude 4,000 feet. Request precautionary landing. ...*

Communication errors: Expectation bias (2)

10 **3.28** Listen to eight pilot-controller communications. When there is an error due to expectation bias in the readback, correct the pilot and repeat the correct information.

ATCO	*Malaysian 485, cleared to SBN, squawk 3164 with IDENT.*
Pilot	*Cleared to SBN, squawking 3184, Malaysian 845.*
A (ATCO)	*Negative, I am calling Malaysian 485. I say again, Malaysian 485 cleared to SBN, squawk 3164 with IDENT.*

ICAO FOCUS

"Bias in understanding a communication can affect pilots and controllers. The bias of expectation can lead to:

- *transposing the numbers contained in a clearance (e.g. a FL) to what was expected, based on experience and routine;"*

Flight Safety Foundation *ALAR Tool Kit 2.3*

Have you ever experienced these kinds of mistakes as a result of expectation bias? Describe the circumstances and the outcome.

Visual references

"When using external references, the visual references must be adequate for the pilot to assess horizontal flight path and vertical flight path."

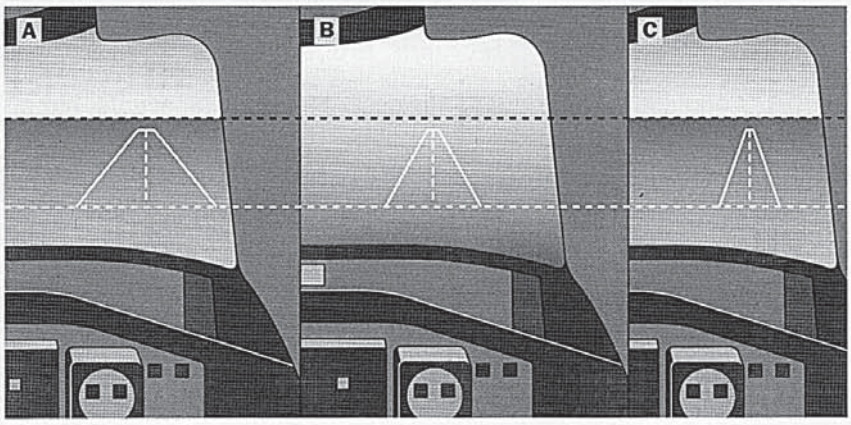
Flight Safety Foundation *ALAR Briefing Note 7.3*

11a What visual references are used during approach and landing?

b Explain what is meant by horizontal and vertical flight paths.

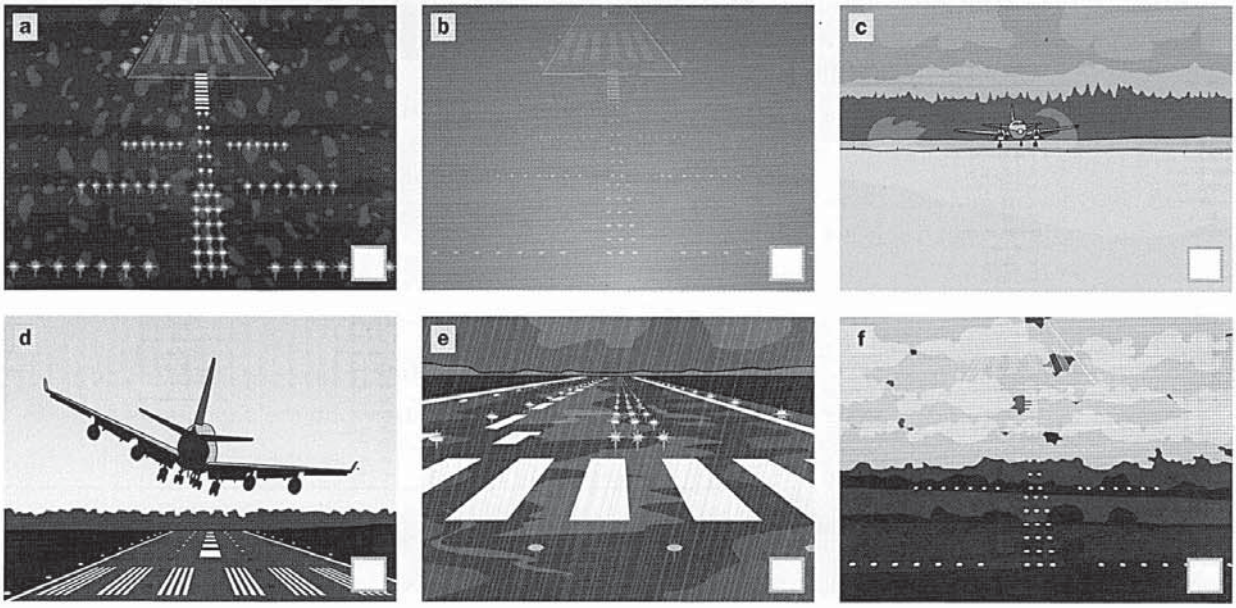
c As a controller, what is your understanding of pilots' perceptions of particular runways?

12a Identify the three views from a cockpit at 200 feet on a three-degree glide path. Match the views (A–C) with the descriptions (1–3), below.



View	Runway	Possible consequences
1	The runway is narrower/longer.	The crew may believe that the aircraft is on a steeper-than-actual flight path.
2	The runway is 45 metres wide and 3,500 metres long.	The crew have an accurate perception of their height above the runway.
3	The runway is wider/shorter.	The crew may believe that the aircraft is on a shallower-than-actual glide path.

b Describe the landing situations in the pictures (a–f), below. Say how, in your experience, they can affect approach.



c ⊙3.29 Listen to six descriptions from the Airbus *Flight Operations Briefing Notes* of different visual and environmental phenomena which can affect pilots' perceptions during approach. Match the descriptions (1–6) to the pictures (a–f).

13 **Student A → p138** **Student B → p146** Take turns to describe the physical terrain in your photo.

There is a single runway, with a large apron area to the right with several hangars, a terminal and different airport buildings. I can see a couple of aircraft parked ... The surrounding terrain appears to be quite mountainous ...

Procedures

LANGUAGE FOCUS: Describing procedures

Pilots and controllers do not only describe individual events, but also procedures, processes or a series of events over time.

Instructions

Do-list

Push** the ENG FIRE pb **to:
- ***cancel** the audio warning;*
- ***arm** the fire extinguisher squib;*
- ***close** the LP fuel valve*
- *and **de-activate** the IDG.*

Completed actions

Checklist

- *ENG FIRE pb ... **pushed***
- *Audio warning ... **cancelled***
- *Fire extinguisher squib ... **armed***
- *LP fuel valve ... **closed***
- *IDG ... **de-activated***

Descriptions

***We are passing** through 3,000 feet.* (ongoing action)
***We have extended** the gear.* (recent past action)
We are stabilised. (present state)

***Pushing** the ENG FIRE pb **cancels** the audio warning; **arms** the fire extinguisher squib; **closes** the LP fuel valve, and **de-activates** the IDG.*

14 Discuss the difference between do-lists, checklists and processes. When are they used and what are they used for?

15a In pairs, write examples of a do-list, checklist and process from either a flight crew or controller perspective.

b **3.30** Listen to ten questions asking whether you have done something. For each one, reply, saying that you are doing it at the moment.

ATCO *Have you repaired the fault?*
A *We are repairing it now.*

c Choose any system, station, screen or control panel which you use as a pilot or controller. Describe its layout and how you use it to the class. Answer any questions.

16a **Student A → p138** **Student B → p146** Take turns to describe processes. Your partner will take notes or draw what you describe to make sure they have understood correctly.

A *The aircraft flies a course of 090 degrees. It then turns right onto a heading of 135 degrees. ...*

b Summarise the events in your partner's descriptions as a report in the past tense.

The aircraft flew on a course of 090 degrees. It then turned right onto a heading of 135 degrees. ...

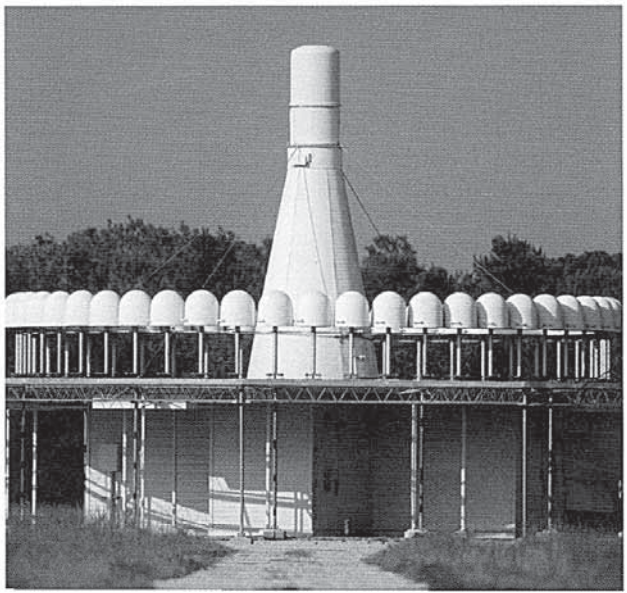
17a **3.31** Listen to part of a VOR approach procedure and complete the notes.

1 Outbound track CAT A/B: _____
2 Outbound track CAT C: _____
3 Descend to: _____
4 Location of beginning of base turn: _____
5 Final approach track: _____
6 Descend to _____ at FAF
7 Location of step-down fix: _____
8 Height at step-down fix: _____

b In pairs, check your answers.

18a **Student A → p138** **Student B → p146** Take turns to read VOR DME procedures. Your partner will take notes and check they have understood correctly.

b In pairs, take turns to describe a flight or control procedure which you often perform.



Crew and team resource management

19a **Match the factors (a–d) in the ICAO focus box to the examples (1–8).**

1 fatigue *d*
2 insufficient human-factors training
3 bad relations between Captain and First Officer
4 inadequate briefing
5 poor glide path monitoring
6 approach flown many times
7 failure to compare DME and altimeter readings
8 desire to get home after a late flight

b **Which of the four factors in the ICAO focus box are most common in your operational experience?**

c **Discuss in groups. What things can be done to reduce the impact of these factors? Think about technology, communication, procedures and behaviour.**

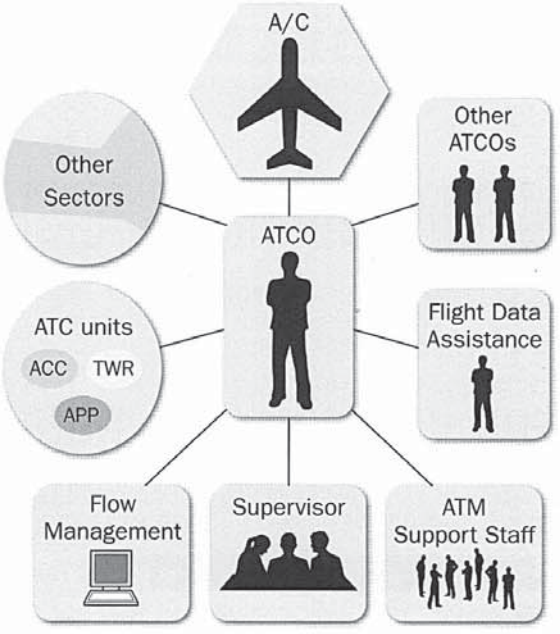
ICAO FOCUS

"The following CRM factors have been identified as contributing to approach-and-landing incidents and accidents:
a Risks associated with complacency
b Inadequate proactive flight management (not staying ahead of the aircraft)
c Inadequate preparedness to respond to changing situations by precise planning and using all flight deck resources
d Crew members' personal factors"

Flight Safety Foundation *ALAR Briefing Note 2.2*

- **Can you give an example of complacency from your operational experience?**
- **How can pilots and controllers be proactive?**
- **How do you think you can best prepare for changing situations?**

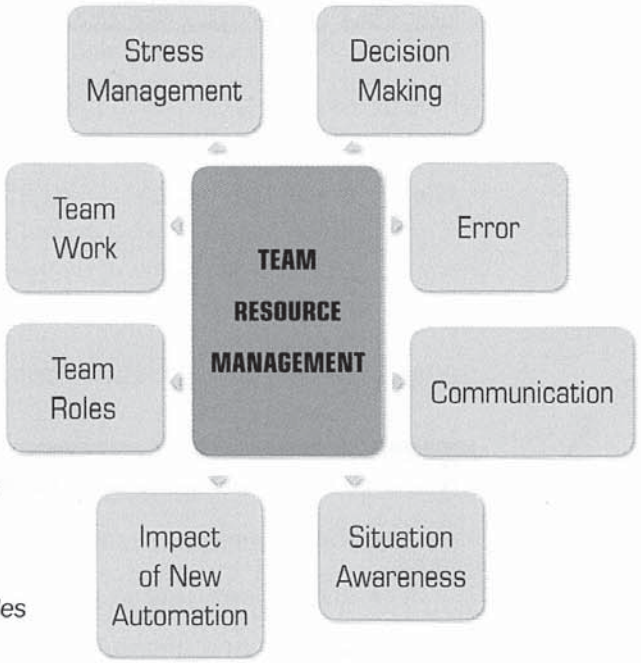
20a **Who do ATCOs communicate with in addition to air crew?**



b **Match the people and departments (1–7) to the descriptions (a–g).**

1 ACC, TWR, APP	a ensures optimum movement of traffic
2 Flow management	b other controllers on the same shift
3 Supervisor	c ATC managing other airspace
4 ATM support staff	d engineers and technicians
5 Flight data assistants	e person in charge of a shift of controllers
6 Other ATCOs	f provide up-to-date MET and other information
7 Other sectors	g ATC managing various phases of flight

21a **In pairs, describe your own work experience of one of the eight aspects of team resource management.**



b **Complete these examples of poor Crew/Team Resource Management with the words in the box.**

	worry	seem	say	expect
look	published	sounded	announcing	

1
First Officer *ATC are _____ heavy rain on arrival.*
Captain *What did you _____?*

2
ATCO 1 *Selair 396, _____ concerned about the approach.*
ATCO 2 *Oh, don't _____. I'm sure they're all right.*

3
ATCO *Mexicana 1285, _____ Flight Level 350 in 20 miles*
Pilot *Flight Level 350 in 20 minutes, Mexicana 1258*

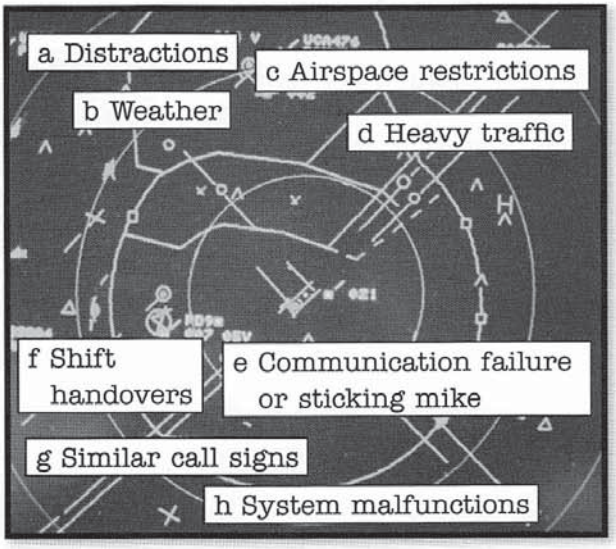
4
First Officer *I can't _____ to contact Haneda Approach on 119.9.*
Captain *I thought that's what Tokyo Centre said. I'm sure it's always 119.9. What's the _____ frequency?*
First Officer *119.1*
Captain *Try that then.*

5
First Officer *Should I request a weather update? The weather radar doesn't _____ good.*
Captain *No, don't bother; we had the ATIS 15 minutes ago.*

c **In pairs, decide what is happening in each short dialogue and what bad practice is demonstrated, for example: complacency; expectation bias; poor team work; using similar call signs; inattention etc.**

Managing threats

22a **3.32 Listen to eight transmissions and match them to the threats (a–h) in the diagram.**



b **In pairs, talk about a difficult working day you have experienced as a pilot or a controller.**

ICAO FOCUS

"During typical operations, controllers have to take into account various contextual complexities in order to manage traffic … dealing with adverse meteorological conditions, airports surrounded by high mountains, congested airspace, aircraft malfunctions and/or errors committed by flight crews, ground staff or maintenance workers."

ICAO Circular 314

- **Give examples from your own experience of the various types of complexity referred to.**
- **What is the difference between a threat and an error?**

23a **Pilots → p156** **ATCOs → p165** **Discuss the adverse conditions at Manila which will affect an approach. Prepare strategies and contingency plans to deal with these threats.**

b **Role play a dialogue between the crew and the controllers to exchange information about the situations in the air and on the ground. Negotiate a successful approach.**

Pilot *Manila Approach, Air China 2539, we are an Airbus A330-200 from Beijing, holding at Flight Level 080. We have a hydraulic failure and have lost our autobraking capability. Can you update us on the condition of runway in use?*

ATCO *Runway 13 is the landing runway. There is standing water on the runway and braking action is poor.*

Pilot *Confirm landing distance available. We are concerned about our braking capability. ...*

Putting it together: Approach and landing accident reduction [ALAR]

> **"**
> - **Refuse clearances that will cause a rushed approach.**
> - **Insufficient time to prepare for a change in plans? Go around.**
> - **Rushed and unstabilised approaches contribute to approach-and-landing accidents.**
> - **Keep priorities straight: safety, passenger comfort/convenience, on-time performance**
>
> **Flight Safety Foundation, *It's sometimes OK to say No!, ALAR Tool Kit***
>
> **"**

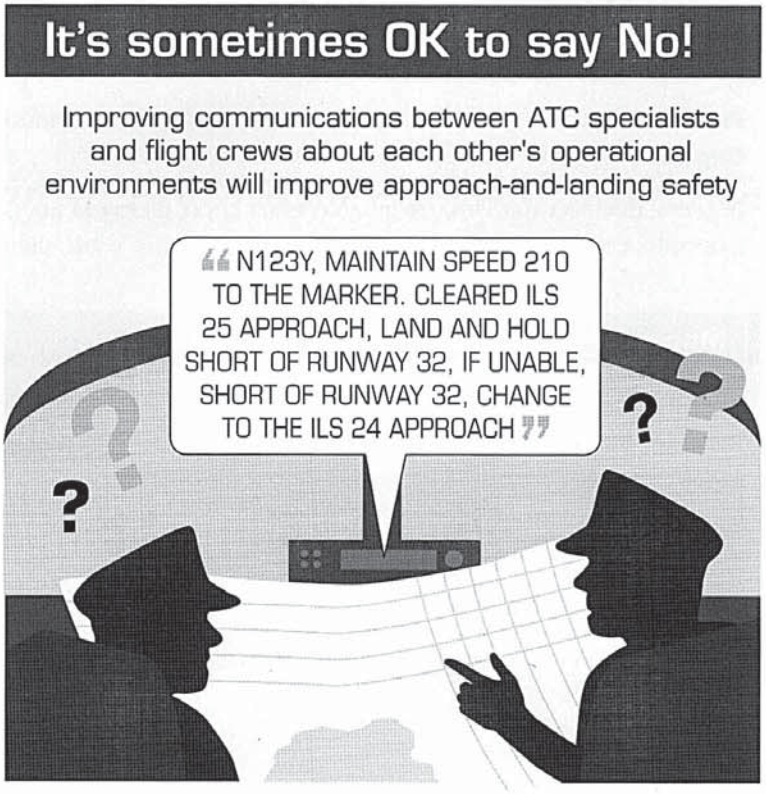
24a **What do you think is happening in this cockpit?**

b **Say what is wrong with the controller's clearance.**

c **What makes for a stabilised approach?**

d **What should the crew do if they have not got enough time?**

e **In your job, how do you manage to reconcile safety, comfort and punctuality?**



Preparation

LANGUAGE FOCUS: Expressing preferences

Proposing a choice	Expressing a preference
Which type of approach do you prefer?	*I'd prefer to make a VFR approach.*
Do you wish to check the figures?	*I'd rather check them.*
What sort of assistance do you want?	*We'd like the fire service and an ambulance.*
Would a nose-in or an outlying stand be preferable?	*It would be better to park at an outlying stand.*
	I'd rather not park at a nose-in stand.

25 **Student A → p138** **Student B → p146** **Take turns to propose choices and express preferences, explaining why.**

A (ATCO) *Do you wish to use Runway 28 Left or 21 Right?*
B (Pilot) *I'd prefer Runway 21 Right because it's longer.*

26a **3.33** **Listen to ten ATC transmissions. Imagine that your colleague did not hear, and report what the controller said. Focus on the key information in each transmission.**

ATCO *Report runway in sight.*
Pilot 1 *What did they say?*
A (Pilot 2) *They told us to report the runway in sight.*

b **3.33** **Listen again and mark the stressed syllable in the words highlighted in the script on page 190.**

27a **In pairs, prepare and carry out a series of pilot-controller communications to resolve or manage the following problems related to approach and landing.**

Pilot	Controller
1 You notice fluctuations in the glideslope indications during final approach.	1 A B737 has failed to intercept the Localizer. An A320 on the opposite base leg is descending to the same altitude and the lateral distance between the two aircraft is decreasing.
2 Your flight is descending to 3,000 feet and receives ATC clearance to continue its approach. A moment later a TCAS RA orders the crew to climb.	2 A controller has become distracted by technicians working next to his position. He has failed to notice an aircraft on short final while another aircraft has been given take-off clearance from the same runway.
3 You are in a hold at 8,000 feet. ATC has told you to expect approach clearance in 15 minutes. Suddenly you smell smoke in the flight deck.	3 A flight has been cleared to make an ILS approach to Runway 26 Left. The Tower controller has the visual impression that the aircraft is on short final to Runway 26 Right.
4 You extend the gear for landing in an ILS approach to Runway 17 Left. All three amber transit lights go off, but only the nose and right green lights illuminate.	4 There is a lot of incoming traffic on a wet evening. There are eight aircraft holding and the average holding time is 20 minutes. An MD-83 descending to 8,000 feet declares an emergency due to smoke coming from the overhead panel.

Pilot *Zhengzhou Approach, Korean Air 809, five miles from touchdown on ILS approach Runway 12. We are experiencing fluctuations in our glideslope indication. Confirm glideslope serviceable, Korean Air 809.*
ATCO *Affirm. Glideslope serviceable. No anomalies reported. Say again your position.*
Pilot *...*

b **Prepare a report of one of your transmissions and deliver it to the class.**

The pilot of Korean Air 809 contacted Zhengzhou Approach five nautical miles from touchdown to report fluctuations on his glideslope indication and asked the controller if the glideslope was serviceable.

Communication

28a **3.34 Read the data about the conditions of an incoming flight. Listen to the step-by-step recorded information. In pairs, acting as pilot and Approach Controller, respond to the developing situation and the questions asked. Make the necessary transmissions. Discuss the actual action taken by the crew at each step.**

Time:	02:00 LT	**Navaids:**	VOR/DME
Met:	stormy, scattered rain showers	**Runway in use:**	31L
Flight:	latter stages of 11-hour flight	**On-board equipment:**	Standard FMS, EGPWS, no GPS

b **Prepare and present a report on what occurred and what decisions you made.**

Debriefing

29 **Report back to the class about the different stages and types of communication in the scenario. Did you find that your interactions were effective, clear and fluent? Why/Why not? Did you agree with the crew's actions in the original flight? Why/Why not?**

Progress check

1 **Complete the progress check for this unit. Assess your proficiency in these areas.**
(1 = I need more work on this, 5 = I feel confident in this area)

- I can say I am unable to perform an action. 1 2 3 4 5
- I can announce a compulsory action. 1 2 3 4 5
- I can announce a completed, or nearly completed, action. 1 2 3 4 5
- I can talk about a situation or problem which has been avoided. 1 2 3 4 5
- I can challenge errors related to expectation bias in readbacks. 1 2 3 4 5
- I can describe different types of procedures and processes. 1 2 3 4 5
- I can suggest appropriate remedial action. 1 2 3 4 5
- I can ask about and express preferences. 1 2 3 4 5
- I can report previous communications. 1 2 3 4 5
- I can discuss situations to solve problems. 1 2 3 4 5

2 **Choose three areas of communication from this unit which you are less confident in. Make plans for improving your skills in these three areas.**

DVD Unit 10

NZ60: A free lesson (Part 2)

30 In Unit 9 you watched a clip about the events which caused the crew of NZ60 to make a go-around. You are going to watch another clip about the decision-making process of the crew of flight NZ60. In pairs, discuss what you remember about the incident.

31a Watch Part 1 (0.00 – 2.54) and make a list of the inputs which guide the crew during approach.

b Why do crews tend to trust the ILS more than the VOR and NDB?

c How did the 'mindset' of the crew of NZ60 affect their initial decision making? How did they reconcile the conflicting information at first?

d What caused the crew to continue questioning the information they were getting?

32a Watch the Part 2 (2.56 – 4.20) and answer the questions.

1 Why is it difficult for a pilot to break trust in the ILS?
2 What caused the crew of NZ60 to stop trusting the ILS?
3 How long did it take them to reach the decision to go around?

b Explain in your own words why 'crosschecking' is important.

33a Part 3 (4.21 – 6.50) discusses the incident using Reason's Swiss Cheese model of accident causation. The model describes how human error can 'breach' (or break) the defences of multiple safety systems and cause an accident. Watch Part 3 and note down the five defences which were breached on Flight NZ60.

b What caused these five defences to be breached?

c What defence was not breached?

d What elements made up the crew's situation awareness?

34a What was the main factor, apart from situation awareness, which contributed to good decision making on Flight NZ60?

b How can trust, team-building and safety-conscious attitudes be threatened in the working context? How can aviation employers best encourage these things? Discuss together.

PART C REVIEW
Approach and landing

Pronunciation

1a **3.35 Listen to ten sentences and underline the words that are emphasised to express urgency.**

1 Climb to 5,000 feet immediately.
2 We have an armed man on board.
3 Turn left heading 230 degrees.
4 We are unable to climb at this time.
5 RVR has decreased to 350 metres and the ceiling is at 300 feet.
6 There seems to be a vehicle crossing the active runway.
7 We are not sure that our nose gear has extended correctly.
8 There have been several reports of windshear half a mile from touchdown.
9 Go around, I say go around. Traffic on 34 Right.
10 We have a severely concussed passenger on board and need to divert.

b **3.35 Listen again and repeat the sentences with the same word stress.**

c **3.36 Listen to 12 sentences and choose the words you hear.**

1 working / walking	4 we'll / well	7 clearing / cleaning	10 high / height
2 again / against	5 wet / wait	8 quiet / quite	11 tanks / thanks
3 watch / wash	6 has / had	9 hold / old	12 fast / past

d **3.37 Listen and repeat the pairs of words.**

Structure

2a **3.38 Listen to 15 sentences and ask for more information using *which*, *who*, *where*, *when*, *why*, *how much*, *how many* and *how long*.**

b **Match the events (1–8) to the actions taken to resolve them (a–h).**

1 There is an Antonov blocking Runway 24L, so
2 They are performing maintenance on the Localizer antenna.
3 Tower, Cathay 1576 on short final. There is a business jet entering the runway.
4 We lost the number 1 generator, therefore
5 Weather conditions over the field still remain very bad.
6 As the autopilot has disconnected
7 We are not entirely sure of our gear extension.
8 Because our flight controls are slightly degraded

a we have started the APU.
b Request a low pass before making our approach.
c I will be making a manual VFR approach.
d Therefore we have decided to divert to our alternate.
e we have switched arrivals to RWY 24 Right.
f I'd prefer to make a long, straight-in approach.
g As a result, we have suspended all ILS approaches.
h We are going around.

c **Complete these sentences with the correct verb.**

1 If the pressure continues to drop, we _____ turn back.
a can b will c may
2 As the flaps are jammed, we _____ to make a flaps-up landing.
a will have b must c shall
3 You _____ advise me if you notice anything unusual.
a may b should c can
4 You _____ intercept the localizer nine miles from the threshold.
a will b can c must
5 _____ the runway not be in sight at Decision Height, I'll call 'go around'.
a Must b Will c Should
6 Our landing gear _____ extend. We request a low pass.
a mustn't b shouldn't c won't
7 You _____ enter the restricted airspace.
a don't have to b mustn't c shouldn't
8 I _____ position you for a ten-mile final ILS Runway 19 Left.
a have b may c will

Vocabulary

3a **Complete the sentences about approach (1–8) with the words in the box.**

veering glare descent stabilised vectors beam slippery confusing

1 The minimum _____ altitude is 850 feet above aerodrome level.
2 The Approach Controller provided radar _____ for the final approach course.
3 The wind is _____ to 190 degrees and wind speed has increased to 12 knots.
4 The Regional Jet seems to be deviating to the left of the Localizer _____.
5 With heavy rain, there can be considerable _____ from the city lights.
6 The runway surface can be very _____ when wet.
7 The aircraft should be _____ at 1,000 feet above touchdown in IMC conditions.
8 There have been cases of pilots _____ runway and motorway lights.

b **3.39 Listen to the eight sentences and number the technical problems (a–h) in the order you hear them.**

a above maximum landing weight ☐
b engine flame-out ☐
c cracked windshield ☐
d faulty high-intensity runway lighting ☐
e frequency congestion ☐
f jammed trailing edge flaps ☐
g radar clutter ☐
h stuck microphone ☐

c **Complete the sentences (1–8) with the words used for time and distance in the box.**

for in between long at inbound on from

1 We should be on the ground _____ 15:30 UTC.
2 Expect further clearance _____ 12 miles.
3 We are 56 miles _____ Adelaide.
4 There are 188 nm _____ Izmir and Istanbul.
5 We will be in the hold _____ 20 minutes.
6 We should arrive in Colombo _____ schedule.
7 Runway 29 Left is 3,456 metres _____.
8 We are eight nautical miles _____ to NHL.

d **Complete these sentences (1–8) with the verbs in the box.**

reported	managed	expected	decided	distracted	called out	experienced	confused

1 The pilots _____ the city lights with the approach lights and had to go around.
2 The crew were _____ by the purser entering the flight deck during the approach.
3 The flight crew _____ to be visual at 800 feet, but only broke out of the clouds just before Decision Height.
4 We _____ a sudden 20-knot loss of airspeed as we crossed the threshold.
5 The cabin crew _____ a leak in the galley.
6 The Captain _____ to divert to Kuwait City.
7 The PNF _____ the radio altitude.
8 We have _____ to isolate the fault.

Fluency

4 **3.40 Listen to six ATC communications and express your concern, using the cues.**

Cues

1 short of fuel / 45 minutes' endurance
2 human organs on board for the local hospital
3 Runway 08 Left 2,100 metres / heavy load / brakes downgraded
4 below minima for VFR approach
5 limited roll control, reduced manoeuvrability
6 passenger with epileptic fit / requires urgent medical assistance

Comprehension

5 **3.41 Listen to the communications between the Tower and an incoming aircraft with an engine shut down after a fire. You will hear the Tower, the captain and then the Fire Chief. Mark the statements True (T) or False (F).**

1 The aircraft is a wide body.
2 It is landing on Runway 19 Right at Dubai.
3 The captain taxies to the gate.
4 The engine is still on fire.
5 The Tower tells the fire service to assist the aircraft.
6 The fire service uses the same frequency as the Tower.
7 The fire is in the compressor.
8 The fire service uses foam.
9 Both engines are shut down.
10 Both fire extinguisher bottles have been used.

Interaction

6 **Pilots → p156** **ATCOs → p165** **The pilot will announce a changing technical problem. The controller will respond to any requests and ask the pilot to give updates on the situation on board. The pilot will provide new information periodically. Take notes and ask for any clarification required or about the consequences of the changed situation.**

Pairwork Activities

STUDENT A

Unit 2

5c Detailed taxi instruction cues

1 Terminal C → Runway 27; 2 Exit A2 → Terminal B; 3 Maintenance Centre → Cargo Terminal A6; 4 Just landed on Runway 01 R → Terminal A; 5 Post Office → Departure Runway 01 R

10 Qualifying

1 The flight is delayed. (–) 2 Traffic is congested. (+) 3 Visibility is poor. (+) 4 A passenger is ill. (–) 5 It is icy. (+) 6 The wing tip is damaged. (+)

11 Clarifying

1 **Problem:** Turk Air 450, 20-minute delay start-up **Cause:** airbridge Gate 23 unserviceable; pax boarding by apron
2 **Problem:** Urga 488, stopped on taxiway B3 **Cause:** large animal on the taxiway ahead
3 **Problem:** Scandinavian 057, Gate C09, require engineering assistance urgently **Cause:** tractor broke tow bar, suspect nose gear slightly damaged
4 **Problem:** Virgin 261, stopped boarding, require security services as soon as possible **Cause:** possibly suspicious packet at Gate 17
5 **Problem:** Air Algérie 284, unable to cross Runway 13R **Cause:** Saudia triple 7 stopped suddenly on Taxiway B
6 **Problem:** Adria 459, request taxi de-icing area **Cause:** very long taxiing, ice and snow build-up
7 **Problem:** Cathay 1343, request re-routeing to Gate 36 **Cause:** Varig MD-11 blocking Taxiway G near fire station
8 **Problem:** Dragonair 359, request new gate allocation **Cause:** waiting 20 minutes, BA triple 7 still at Gate 24
9 **Problem:** Malaysian 45, we need a doctor at Gate 35 quickly **Cause:** pax ill, suspect heart attack
10 **Problem:** Japan Air 445, report vehicle on runway **Cause:** blue pick-up truck still near threshold Runway 21

12c Abbreviations

1 ACC 2 AFIS 3 amsl 4 ATIS 5 DME 6 ETD

14d Descriptions

1 GPU 2 Radar antenna 3 Follow-me car 4 No-entry sign 5 Touch-down zone 6 De-icing vehicle 7 Control tower 8 Tanker

21 Detailed taxi instructions

1 After landing on Runway 16L via Taxiway P to North Apron 2 North Ramp to Runway 16R 3 After landing on Runway 34R to South Satellite 4 South Transient Parking to North Ramp 5 After landing on Runway 34C to Transient Parking

22 Giving instructions and solving problems

1 737 / our right / Taxiway K
2 Tunisair 435 / Taxiway B2 / elderly pax / severe chest pains
3 Dust / ploughing field next Taxiway H / request deviation
4 Dog / Runway 31L
5 Torching / RH engine / 757 / ahead / Taxiway E
6 Egyptair 279 / need reset INS coordinates prior take-off
7 Swiss 248 / poor braking surface / passed high-speed turn-off F2 / request backtrack
8 Due low visibility / unsure our position
9 Engine blast / 747 ahead / blowing debris
10 Confirm line up / traffic / short final

Unit 3

12 Requests from the apron

1 Apron Control, Air France 396, A321, Stand T18, APU inop, GPU, before engine shutdown.
2 Vietnam Airlines 571, outlying stand M 08, no airstairs or coaches to meet us.
3 Avianca 746, Gate 29, prisoner and escort on board, confirm police escort at gate.
4 New Zealand 222, waiting for vegetarian meals from catering, five additional passengers, expect ten minutes' delay.
5 TACA 519, arriving Gate 27, two stretcher cases + nurses, require medical assistance.
6 Apron Control, Jordanian 183, ground power inop at Gate 31, request authorisation to keep APU running.
7 TAROM 361, still waiting for Stand 08 to be vacated, another stand available?
8 South African 552, taxiing C1, Engine #4 vibrations, request return to gate, line maintenance.
9 Aeroflot 174, reporting ice patches on inner taxiway opposite Gates 27–31.
10 Syrian Air 397, request high-speed tug, run-up area, after repair Engine #2.

Unit 4

9 1.43 Incomplete transmissions (Part 2)

1 Mexicana 395, hold position, after departure maintain runway heading till through 2,500 feet QNH 1006 then turn right.
2 Oman Air 274, hold at the holding point.
3 Cleared for take-off, Qantas 5389.
4 Perm Air 4411, behind A320 on short final, line up behind.
5 Asiana 5841, contact Tower 118.1.
6 Tower, All Nippon 369, backtracking Runway 24 Left.
7 Belarus Avia 337, taxi to holding point Charlie 2, line up and wait Runway 34 Left, Number 1 to depart before you from holding point Charlie 3.
8 CSA lines 627, we are still on Runway 07 Left.

16 Confirming, read back

1 Thai 1648 / behind landing A320 / short final / line up behind
2 Stripe 328 / taxi holding point B2 via A and B / hold short RWY 08L
3 Southwest 761 / caution / jet blast / departing A380
4 Vietnam 466 / vacate A2 / Ground 121.35
5 Jamaica 377 / wind 120° / 5 kts / visibility 6 kilometres / 1,800 ft overcast
6 Hapag Lloyd 2089 / Temperature 16° / dew point 18° / QNH 1007 / RWY 29R
7 Tam Meridional 375 / behind landing B787 / short final / line up behind
8 Avianca 385 / caution / work in progress ahead / west side / TWY S3
9 Speedbird 381 / cross RWY 12 / taxi holding point C3 / hold short / RWY 01
10 Air Canada 238 / current Information K / now QNH 993 hPa / after 777 passing right-left / taxi holding point B2 RWY 31L

18b **Progressive taxiing in the past**

22:36	request pushback and start-up	22:49	hold short RWY 07R/25L
22:39	push back Stand 06	22:51	receive crossing instructions
22:41	taxi north-east end of Terminal 2 pier	22:53	taxi D2, hold short RWY 02
22:44	turn right, head south outer taxiway	22:54	request take-off clearance, #3 in line
22:48	turn left onto C6	23:05	line up and wait RWY 02

Unit 5

7c **ATIS**

- CYYZ (Toronto Pearson International Airport)
- Information Delta
- Weather 1300 Zulu
- Wind 020° at 3 kts
- Visibility: 10 kilometres
- Ceiling: 14,000 broken, 25,000 broken
- Temperature: 7
- Dew point: –2
- QNH: 1017 hPa
- IFR approach is ILS Runway 15R
- Departure runway 15L
- All runways 100% clear and dry
- Runway 06R / 24L closed for repairs
- Monitor frequency 133.1 for NOTAMS not available by datalink
- Inform ATC that you have Information Delta

Airport		Dew point	
Information		QNH	
Time		ILS RWY	
Wind direction/ velocity		Landing RWY	
Visibility		Departing RWY	
Precipitation		NOTAM data	
Ceiling		Special instructions	
Temperature			

8 **Changing weather conditions**

Question	Response
1 wind	a weather (better)
2 visibility	b precipitation (less)
3 temperature	c wind (less) / ➔ South-west / gusting 15 kts
4 cloud cover	d fog (thicker)
5 fog	e temperature (higher)

9 **Expectation bias**

Pilot readback cues

1 TS / 200 miles ahead / 10 miles north-west / flight path
2 Maintaining heading 190°, Aeroflot 3587
3 Maintaining FL 310, descent after Minsk, Kyrmal 391
4 Remaining outside controlled airspace, Janex 539
5 Severe turbulence to the west of Nova Scotia, US Air 1563
6 SCT 4,000 ft / BKN 9,000 ft / temp 17° / dew point 16° / QNH 998

ATCO input cues

1 White Eagle 268, expect joining clearance at time 55, time is 45
2 Gulf Air 395, recent rain showers, standing water at midpoint Runway 34L, braking action medium
3 Broken 2,500 feet, overcast 5,000 feet, temperature –4°, dew point –6°, QNH 979 hPa
4 Virgin 5742, delaying action, make one 360 turn to the right
5 UPS 3694, cleared straight in ILS approach Runway 26 Right, descend to altitude 3,000 feet, QNH 1015, report established on Localiser
6 China Eastern 467, Information Romeo, 1600Z, wind 020° at 13 knots gusting to 24, QNH 1012, visibility 1,500 metres

15 Asking and answering questions about the weather

ATCO cues

1 How high do the icing conditions extend?
2 What is your weather radar displaying?
3 Do the tops look smooth?
4 What sort of turbulence did you encounter?
5 Say flight conditions
6 What is the freezing level in the Stanford area?
7 How much ice build-up are you experiencing?
8 What's your current speed?
9 What are your flight conditions at 6,000 feet?
10 Did you experience any windshear on approach?

19a An approach in windshear conditions

Your flight

Time		Wind at 200 ft	
Flight number		Airspeed at 200 ft	
Aircraft type		Wind at threshold	
PF		Time of decision	
Approach RWY		Altitude climbed	
Wind at 1,000 ft		Type of circuit	
Wind at 500 ft		ATC instructions	

Your partner's flight

Time		Wind at 200 ft	
Flight number		Airspeed at 200 ft	
Aircraft type		Wind at threshold	
PF		Time of decision	
Approach RWY		Altitude climbed	
Wind at 1,000 ft		Type of circuit	
Wind at 500 ft		ATC instructions	

21c Flight encountering icing

1 Aircraft / depart / on time?
2 Who / at controls?
3 To which altitude / ATC / instruct / descend?
4 Co-pilot / read back / altimeter setting?
5 FDR / show?
6 Why / controller / not concerned?
7 Controller see / before a/c disappeared?
8 Location / dangerous ice formation?

Unit 6

5 Reporting level-bust incidents

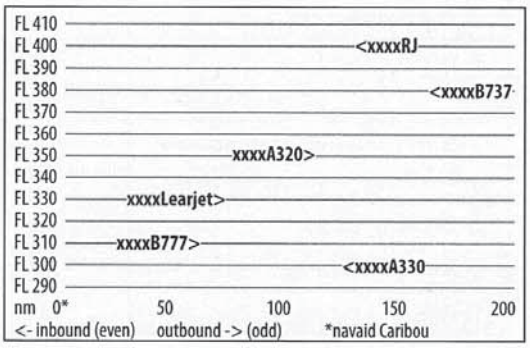
1 Air Force Hercules / departing Lagos / cleared 8,000 ft / climbed 9,000 ft / instructed by ATC / descend 8,000 ft
2 Saab 340 / approach Bergen / cleared 2,500 ft / continued descent 2,000 ft / traffic conflict / ATC contact / avoidance / LH turn / climb 2,500 ft
3 A320 / cleared descent FL 250 from FL 310 / Casablanca / re-cleared stop FL 280 passing FL 290 / levelled at FL 270 / climbed FL 280
4 B737-800 / climbing out Madrid / crew thought cleared from FL 080 to FL 160 / read back / passing FL 089 / told by ATC / taken another flight's clearance
5 Embraer / approach Manila / cleared 4,000 ft / observed by ATC at 3,600 ft / instructed climb / altimeter setting error

14 *When, what, how* and *where*

1 FL 390	6 Expected approach time 08:25	11 280 kts
2 at 14:56	7 Reduce to minimum clean speed	12 in five minutes
3 by orbiting to your right	8 Descend FL 210	13 over the outer marker
4 over Panama NDB	9 in the vicinity of Mendoza	14 by reducing your speed
5 Climb to 6,000 ft	10 abeam Hanover	15 while passing through FL 280

22a Managing separation

Requests:
1 A330 150 nm inbound from FL 300 to FL 360
2 RegionalJet 150 nm inbound from FL 400 to FL 320
3 Learjet 50 nm outbound from FL 330 to FL 410
4 B737 200 nm inbound from FL 380 to FL 320



Unit 7

5 Incident reporting

1 Bird strike / lost thrust Engine #1 / turn back / request ILS approach RWY 21
2 Lost all display units / only standby instruments / performed checklist / request return to land
3 Severe turbulence FL 370 / 8 pax and 2 attendants injured: fractures, concussion and bleeding / cabin crew assessing situation / request diversion
4 DHL 1274 / cargo pallets shifted / flight engineer trying to secure / concerned about centre of gravity / request precautionary landing
5 Suspicious parcel / in galley / isolated and placed by rear right-hand door / request immediate landing
6 Asiana 445 / electrical fire aft galley / smoke in cabin / under control / diverting to Xiantao
7 Air Ontario 486 / wing leading edge de-icing failed / ice building up / request immediate descent
8 Thai 483 / lightning strike / PFD and ND malfunctions / standby analogue instruments / suspect flight controls not responding normally / request diversion and expedite descent

6a US Air 1549: Sequence of events

___ a Pilot said he would try to go to Teterboro.
___ b Pilot decided to try and land on the Hudson River.
___ c Controller informed the Tower at LaGuardia of the emergency.
___ d Pilot landed on the Hudson River at 13:31.
___ e Pilot reported bird strike and loss of thrust in both engines.

21a Intentions drill

Questions

1 Turn back? 2 Shut down engine 2? 3 Descend to FL 250? 4 Make a PAN call?
5 Go around? 6 Jettison some fuel? 7 Divert to Gander? 8 Land at Stansted?

Responses

1 Overfly Karatau 2 Make a PAN call and perform a precautionary landing
3 Remain on the present frequency 4 Request a left turn in five minutes 5 Land immediately
6 Change his seating 7 Monitor the cabin altitude 8 Land on the Hudson River

Unit 8

3a 3.02 Skidding helped prevent an excursion

Environmental conditions		Crew action	
1 ATIS report: RWY 18 surface		1 Time crew contacted tower	
2 Braking action		2 Aircraft position on glide slope at 50 ft	
3 Visibility		3 Touchdown point	
4 Ceiling		4 Touchdown speed	
5 Wind direction		5 F/O's 1st action	
6 Wind speed		6 When captain took control	
7 3 min. before touchdown: RWY 18 surface		7 CAPT action at last 800 m	
8 Braking action		8 Effect of this action	
9 Actual surface		9 Point aircraft stopped	
10 Actual braking action		10 Damage to aircraft	

6

Expectations	Changes and corrections
1 ILS approach to RWY 26R	1 expedite descent / 1,500 ft/min
2 a lower level in 12 miles	2 600 m / rain
3 straight-in approach to RWY 29L	3 RWY 07L closed / RWY 07R in use
4 wind 230° / 7 kts	4 060° / 14 kts
5 on the ground / 15 minutes	5 conflicting traffic / intercept radial 284°
6 descent in 12 miles	6 military traffic in area / cross at 12,000 ft

Unit 9

8b Requesting clarification

1 This will be a surveillance radar approach to the runway in use.
2 Runway 04 Left is only being used for departures. Expect delays on all incoming flights to Runway 04 Right.
3 You have traffic at 11 o'clock.
4 Be advised of terrain rising to 2,800 feet near the approach path.
5 The ILS is not fully serviceable.
6 The last flight to land reported windshear on final.
7 Visibility is decreasing quite rapidly.
8 Expect further climb in five miles.
9 Debris has been reported on Runway 29 Left.
10 There are several aircraft ahead of you on approach.

11 Reporting a failure

1 Left-hand tank fuel pump failure
2 High-pitched whistling sound from the forward left cabin door
3 Outflow valve fault and excessive cabin altitude
4 Autopilot disconnect and unable to re-engage
5 LH flap jam at 5° and flap asymmetry message. Unable to extend flaps to landing configuration
6 Forward cargo smoke. Extinguisher discharged

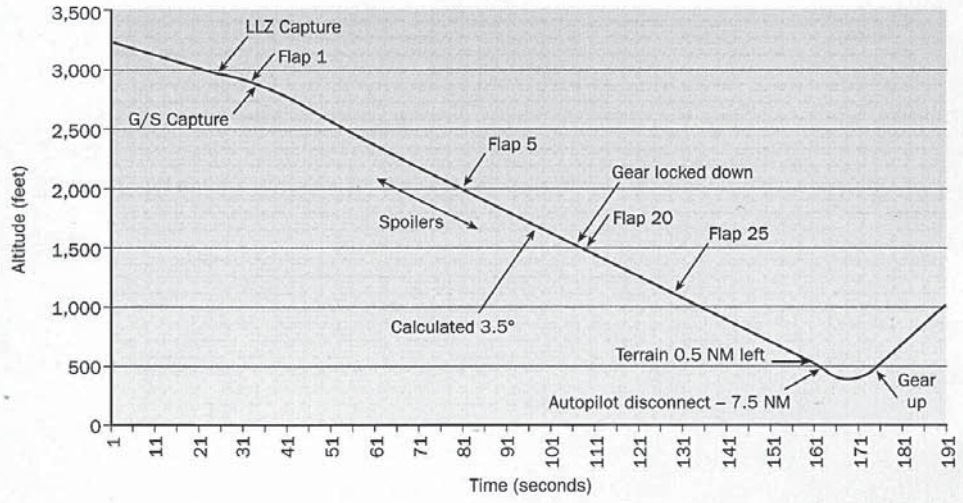
13 3.17 Electrical problems approaching Bangkok

Circumstances of the flight		Consequences	
1 Route:		1 Event at 08:40:	
2 Passengers: Crew:		2 AC buses not powered:	
3 Altitude at 08:37 UTC		3 System disconnected:	
4 Flight phase:		4 System disengaged:	
5 Incident in forward galley:		5 Display lost:	
6 Incident reported by:		6 Status of AC bus 4:	
7 Nature of the water:		7 State of circuit breakers:	
8 Cabin crew action:		8 Strength of radio transmissions:	
9 State of cabin lights:		9 EPR indication available:	
10 Time, RWY and type of landing:		10 State of cabin lights:	

18 Self-correction

1 Autopilot disconnected / Autothrust disconnected
2 Maintain heading 120 / 220
3 Wing anti-ice fault / Engine anti-ice fault
4 Green system lost / Blue system lost
5 1013 hPa / 1003 hPa
6 RWY 27R / RWY 27L
7 Pitch damper failure / Lift dumper failure
8 Engine fire / Tailpipe fire
9 Headwind / Tailwind
10 Approach Control / Area Control

25a, b Debriefing Flight NZ 60



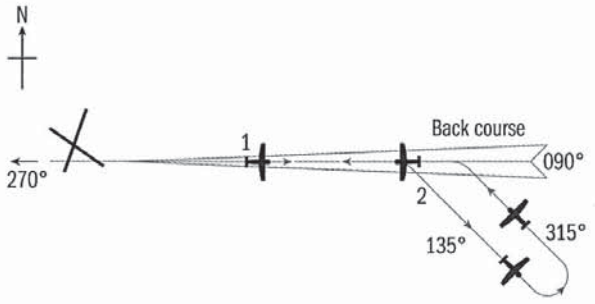
Unit 10

13 Airfields from aloft

16a Describing a process

1 Describe the movements of the aircraft in diagram 1 and ask your partner to draw the horizontal flight path.
2 Describe the step-down approach in chart 2 and ask your partner to draw the vertical profile.

1



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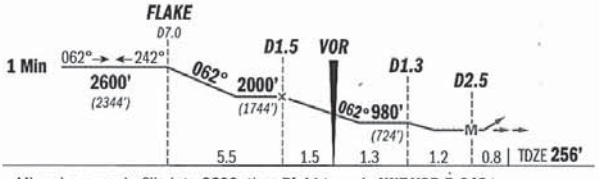


Missed approach: Climb to **2600,** then **Right** turn via **UNZ VOR R-242** to **FLAKE INT/D7.0** and hold.

18a VOR DME approach

After passing IAF 14 miles DME on radial 009, turn left to fly DME arc radius 12 miles DME descending to 4,600 feet. Crossing lead radial 075°, turn right to establish final approach track 265° descending to 3,800 feet. At FAF, 6.1 miles DME, descend to MDA to cross step-down fix 4.5 DME at 3,290 feet.

25 Proposing a choice

1 RWY 28L/RWY 21R
2 long/short final
3 hold/divert
4 left/right orbit
5 visual/ILS

STUDENT B

Unit 2

5c Detailed taxi instruction cues

1 General Aviation Terminal → Maintenance Centre; 2 Cargo B3 → Departure Runway 27;
3 Terminal B → Departure Runway 19L; 4 Fire Station → Maintenance Centre;
5 Just landed Runway 09 beyond intersection Runway 01R → 19L → Terminal A.

10 Qualifying

1 The nose gear is damaged. (+) 2 The tank is leaking. (+) 3 Communication is poor. (+)
4 I am concerned. (+) 5 The cabin crew are tired. (–) 6 The instructions are unclear. (–)

11 Clarifying

1 **Problem:** Brit Air 268, can't make our 45 slot now **Cause:** baggage loader broken, still waiting for new loader
2 **Problem:** Qantas 233, unable to park in our stand yet **Cause:** South African 747 still occupying Stand D41
3 **Problem:** Vietnam Airlines 691, request fire service quickly **Cause:** refuelling failed to stop, fuel spillage
4 **Problem:** Air China 206, request taxi N **Cause:** emergency services still blocking M
5 **Problem:** Air Mauritius 228, unable start on time **Cause:** additional freight, currently calculate new C.G.
6 **Problem:** Jetblue 507, we need a mechanic at the ramp **Cause:** F/O just detected F.O.D. on engine #2
7 **Problem:** South African 597, request earlier departure as soon as possible **Cause:** due delay, crew risk exceeding legal working time
8 **Problem:** Singapore 263, request new taxi instructions **Cause:** A380, tight turn K to J
9 **Problem:** Midland 452, start-up now **Cause:** engineer just finished repairing door seal
10 **Problem:** COPA 182, request return parking **Cause:** received company re-routeing, require larger fuel reserve

12c Abbreviations

1 IMC 2 NDB 3 PAPI 4 RVR 5 SID 6 VFR

14d Descriptions

1 Fire truck 2 De-icing gantry 3 Airbridge (gangway) 4 Catering truck
5 Holding-point markings 6 Cargo container (ULD) 7 Tow-bar 8 Wind sock

21 Detailed taxi instructions

1 North Cargo Ramp to Runway 34C 2 After landing on Runway 16R, to North Satellite 3 South Ramp to Runway 16C 4 After landing on Runway 34C, via Taxiway H to South Ramp 5 South Ramp to North Cargo Ramp

22 Giving instructions and solving problems

1 Speedbird 376 / thunderstorm overhead / request delay departure
2 Oman 076 / MD-81 stopped / ahead / Taxiway T2
3 Northwest 2439 / attendant / food poisoning / request return to apron
4 Slovakia 385, unable cross RWY 29L / Aeroflot Ilyushin 86 stopped / holding point Taxiway G
5 Air Canada 357 / long time in line / snow + ice building up on wings
6 Varig 532 / vacated RWY 13R / reporting metal debris / side runway / 600 m threshold
7 Malev 484 / departure clearance and squawk
8 Southwest 299 / radio check
9 Air India 507 / torrential rain / flooding Taxiway J / visibility low
10 Spanair 288, loose plastic / blowing / apron Terminal B

Unit 3

12 Requests from the apron

1 Apron Control, Southwest 3284, Stand 23, baggage cart blocking access to stand
2 Finnair 593, Gate 47, jetty unserviceable, airstairs, disembark via apron
3 Iberia 850, Stand C15, wrong tractor for pushback, A320, new tractor asap
4 Apron Control, Air Canada 819, A330, showing one main gear tyre low pressure, maintenance and later slot
5 Air China 748, Stand 21, catering truck collided aft RH door, technical inspection for damage
6 Lufthansa 826, departure delayed 45, due return to stand sick pax, de-icing
7 Apron Control, Varig 028, condition of taxiways and runways due freezing conditions
8 Delta 45, taxiing B1 to Gate F15, fumes + odour in rear cabin, fire services, instructions
9 Virgin 229, taxiing Stand A36, 3 intoxicated pax, ambulance and medical assistance
10 Transat 427, Gate 14, unruly football fans on board, attendant injured, police, baggage handlers

Unit 4

9 O1.43 Incomplete transmissions (Part 1)

1 Taxi to holding point Echo 2 Runway 28 Left via Taxiways Lima and Hotel.
2 Follow the Boeing 737 coming from your left, taxi to holding point Delta 1 Runway 04 Right via Taxiway Golf.
3 Ground, Philippine 493, information India, QNH 1018, request start-up.
4 Tower, Aviair 763, we are at the intersection of November and Tango. Request detailed taxi instructions to Runway 19 Left.
5 Tower, Finnair 2658, reporting a large flock of birds near the threshold of Runway 23 Right.
6 American 769, Runway 07 Left, cleared for take-off. Report airborne on 121.95.
7 Germanwings 3627, line up and wait, Runway 26. Vehicle crossing centre intersection.
8 Ground, cleared for take-off, Runway 33 Right, Kuwaiti 5319.

16 Confirming, read back

1 2nd right / T4 / Ground 121.9
2 Regional 028 / cross RWY 31L / holding point 31R
3 Libair 496 / taxi / caution / dense fog
4 Turk Air / behind landing A320 / short final / line up behind
5 RVR of 350, 325 and 275 at touchdown, midpoint and stop end respectively
6 Wind 210 / 15 / visibility 8 kilometres / base 2,800 ft broken
7 Temperature –3° / Dew point –6° / QNH 1013 / RWY 08L
8 Black Sea 549 / caution / large flock birds / centre runway
9 Pacific 138 / behind landing Embraer / short final / line up behind
10 All Nippon 762 / vacate B1 / Ground 121.8

18b Progressive taxiing in the past

16:08	request pushback and start-up	16:21	hold short RWY 02 / 20
16:11	push back Stand 14	16:23	cross RWY 02 / 20
16:14	taxi east outer Taxiway 9	16:25	taxi F3, Y and C1
16:18	cross outer Taxiway 7	16:31	hold short RWY 07R / 25L
16:20	turn right Taxiway E5	16:33	backtrack RWY 25L to line up

Unit 5

7c **ATIS**

- UUEE (Moscow Sheremetyevo International Airport) Information India
- 1755 Zulu Automated Weather
- Wind 260 at 15 gust 19
- Visibility 6, light snow
- 2,600 broken, 3,500 overcast
- Temperature: –5
- Dew point: –11
- Altimeter 997 hPa
- ILS runway 25R approach in use
- Landing runway 25R
- Departing runway 25L
- Notices to Airmen: Work in progress on TWY B
- Read back all runway assignments and all hold short instructions
- Use caution for birds in the vicinity of the active runway
- Advise the controller on initial contact, you have India

Airport		Dew point	
Information		QNH	
Time		ILS RWY	
Wind direction/ velocity		Landing RWY	
Visibility		Departing RWY	
Precipitation		NOTAM data	
Ceiling		Special instructions	
Temperature			

8 **Changing weather conditions**

a wind (increase) / 12 kts / → NW
b visibility (more) / 2,000 m
c temperature (less) / 3°
d cloud cover (less)
e fog (less)

1 weather
2 precipitation
3 wind
4 fog
5 temperature

9 **Expectation bias**

ATCO input cues

1 Lufthansa 3165, caution: there is a thunderstorm 200 miles ahead of you and ten miles to the south-east of your projected flight path, moving north-west.
2 Aeroflot 3587, climb and maintain FL 190
3 Kyrmal 591, maintain FL 310, expect descent after Minsk
4 Japan Air 539, remain outside controlled airspace, expect joining clearance at time 35
5 US Air 1563, westbound flights have been reporting severe turbulence in the region of Nova Scotia.
6 Scattered 4,000 feet, broken 9,000 feet, temperature 17°, dew point 16°, QNH 989 hPa

Pilot's readback cues

1 Joining clearance time 45 / White Eagle 268
2 Heavy rain / braking action poor / Runway 34L / Gulf Air 395
3 BKN 2,500 ft / OVC 5,000 ft / temp –4° / dew point –6° / QNH 997 hPa
4 360 turn left / Virgin 5742
5 Cleared straight in ILS approach Runway 26L / descend to altitude 3,000 ft / QNH 1015, UPS 3694
6 Information R / QNH 1022 / China Eastern 467

15 Asking and answering questions about the weather

ATCO cues

1 What type of icing conditions are you experiencing?
2 When did you encounter the wake turbulence?
3 How's your ride at FL 210?
4 Do you require de-icing before departure?
5 When do you anticipate being clear of the weather?
6 Can you describe the buffeting you are experiencing?
7 Do you have any weather returns on your display?
8 How are the passengers responding to the turbulence?
9 Have you suffered any material damage from the hail?
10 What are your intentions with the thunderstorm overhead the field?

19a An approach in windshear conditions

Your flight

Time		Wind at 200 ft	
Flight number		Airspeed at 200 ft	
Aircraft type		Wind at threshold	
PF		Time of decision	
Approach RWY		Altitude climbed	
Wind at 1,000 ft		Type of circuit	
Wind at 500 ft		ATC instructions	

Your partner's flight

Time		Wind at 200 ft	
Flight number		Airspeed at 200 ft	
Aircraft type		Wind at threshold	
PF		Time of decision	
Approach RWY		Altitude climbed	
Wind at 1,000 ft		Type of circuit	
Wind at 500 ft		ATC instructions	

21c Flight encountering icing

1 Fly / from?
2 When / co-pilot / request direct PAR?
3 Aircraft's / rate of descent?
4 Controller / see / his screen?
5 Cause / transponder loss?
6 Quality / radar return?
7 Result / ice formation?
8 CVR / warning?

Unit 6

5 Reporting level-bust incidents

1 B767 / en route Kuala Lumpur – Singapore / FL 310 / downdraughts + turbulence / a/c dropped 900 ft / regained FL 310
2 A319 / departure Riga / cleared 6,000 ft / crew requested higher due weather / cleared FL 120 / level-off, TCAS RA 'Descend' / crew forgot set standard pressure of 1013
3 B757 / descending Oakland / cleared FL 110 / PF entered FL 100 on (autopilot) Mode Control Panel / ATC contact / instructed / climb back / FL 110
4 Learjet / approach Anchorage / hold 9,000 ft / crew heard clearance descend 7,000 ft / ATC warning / clearance for another a/c / regained 9,000 ft
5 A320 / leaving Brisbane / cleared 5,000 ft / set 8,000 ft on (autopilot) Flight Control Unit / passing 5,900 ft / ATC contact / orbited / avoid traffic / cleared FL 120

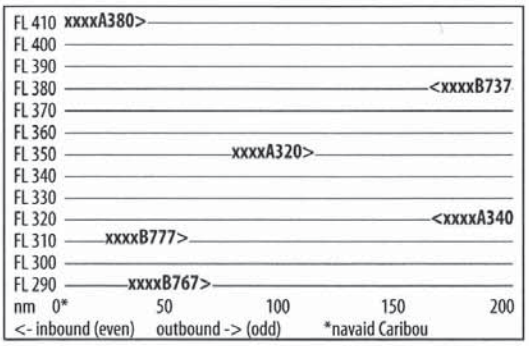
14 *When, what, how* and *where*

1 ten minutes ago
2 on the Localizer
3 by expediting your approach
4 ETA 13:26
5 FL 170
6 Fly heading 210
7 three miles from SAN VOR
8 Contact Approach on 118.95
9 in the area of Hanoi
10 Immediately
11 Mach 0.79
12 in 20 minutes time
13 by climbing to a higher level
14 Report distance from QEC VOR
15 overhead the field

22a Managing separation

Requests:

1 B767 50 nm outbound from FL 290 to FL 350
2 A340 200 nm inbound from FL 320 to FL 380
3 A380 0 nm outbound from FL 410 to FL 330
4 B777 50 nm outbound from FL 310 to FL 390



Unit 7

5 Incident reporting

1 Volcanic ash / Engine #3 stall / St Elmo's fire on windshield / 180° turn / request descent
2 Contradictory Captain and First Officer glideslope displays / disconnect autopilot / request visual approach RWY 31L
3 Middle-aged male pax / threatening behaviour / restrained by cabin crew / referred to explosives in hold / request immediate diversion
4 Female pax / severe asthmatic attack / oxygen by crew at the moment / condition stable / may request diversion
5 China Southern 498 / 170 nm north Shanghai / hydraulic system #1 failure / severe leak / advised company Ops and Engineering / proceeding with caution / may require assistance on landing
6 Skymark 471 / Engine #2 stall / unable relight / above Maximum Landing Weight / request area 30 tonnes fuel jettison
7 Singapore 527 / #3 low oil pressure warning / engine idle / request diversion to station servicing CFM 56B engine
8 Qantas 587 / acrid odour in flight deck / masks donned / cockpit smoke checklist performed / F/O inspecting electronic racks / request direct Hobart

6a US Air 1549: Sequence of events

___ f At 3,000 ft, the crew began emergency landing procedures.
___ g Controller instructed pilot to turn left onto a heading of 220.
___ h US Airways Flight 1549 left New York's LaGuardia airport with 155 people on board.
___ i Passengers and crew evacuated the aircraft on emergency slides.
___ j Controller proposed an approach to RWY 13.

21a Intentions drill

Responses

1 Continue 2 Let it idle 3 Maintain FL 310 4 Continue to our destination
5 Land on RWY 17L 6 Burn off some fuel 7 Continue to Boston 8 Land at Gatwick

Questions

1 Fly direct to Almaty? 2 Declare an emergency? 3 Switch to the standby frequency?
4 Maintain your present heading? 5 Make a low pass? 6 Restrain the passenger?
7 Make an emergency descent? 8 Return to LaGuardia?

Unit 8

3a **8.2 Skidding helped prevent an excursion**

Environmental conditions		Crew action	
1 ATIS report: RWY 18 surface		1 Time crew contacted tower	
2 Braking action		2 Aircraft position on glide slope at 50 ft	
3 Visibility		3 Touchdown point	
4 Ceiling		4 Touchdown speed	
5 Wind direction		5 F/O's 1st action	
6 Wind speed		6 When captain took control	
7 3 min. before touchdown: RWY 18 surface		7 CAPT action at last 800 m	
8 Braking action		8 Reason aircraft skidded	
9 Actual surface		9 Point aircraft stopped	
10 Actual braking action		10 Damage to aircraft	

6

Expectations	Changes and corrections
1 rate of descent 1,000 ft/min	1 wind 180 10 kts / 19L in use
2 visibility 2,000 m / overcast	2 heavy traffic / expect lower 20 miles
3 ILS approach to RWY 07L	3 terrain / circling approach / RWY 29R
4 wind 080°/ 11 kts	4 210 / 11 kts
5 intercept radial 265 / Haito VOR	5 only one RWY in use / maintain present level
6 cross PADDY at 10,000 ft	6 precautionary landing / orbit right / #3

Unit 9

8b **Requesting clarification**

1 The far end of Runway 17 is contaminated.
2 Contact Krakow Approach.
3 If radio contact is lost and you are unable to continue this approach, climb to the minimum safe altitude.
4 You are familiar with the Munich missed-approach-with-lost-communication procedure.
5 Air Berlin 284, approaching seven miles from touchdown. Commence descent now to maintain glide path.
6 GNSS Nav may not be available due interference in the vicinity.
7 Are you able to cross Lodz?
8 There has been a power cut and some of the airport lighting and ground support is not available.
9 The wind has changed velocity since Information Golf.
10 Be advised that there are extensive industrial fumes from 190-foot factory chimneys two miles out near the approach path.

11 Reporting a failure

1 Trim fuel valve fault. Unable transfer fuel forward from trim tank
2 Engine 1 EGT over limit. Throttled back Engine 1. 30 kts airspeed penalty
3 Auto brake fault
4 LH windshield heat fault. Icing conditions during descent and approach
5 IDG 2 oil low pressure and disconnect
6 Horizontal stabiliser jam

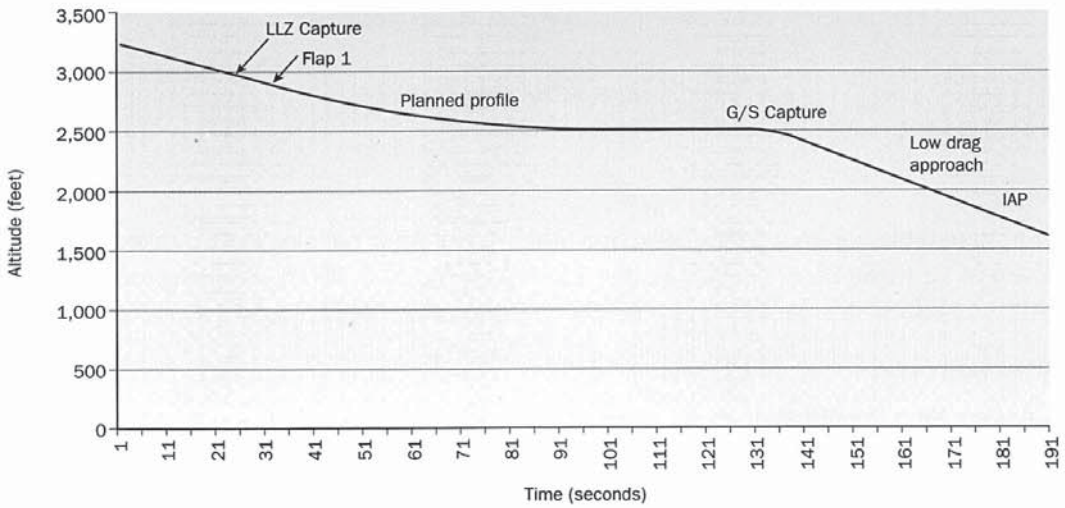
13 3.17 Electrical problems approaching Bangkok

Circumstances of the flight		Consequences	
1 Route:		1 Event at 08:40:	
2 Passengers: Crew:		2 AC buses not powered:	
3 Altitude at 08:37 UTC		3 System disconnected:	
4 Flight phase:		4 System disengaged:	
5 Incident in forward galley:		5 Display lost:	
6 Incident reported by:		6 Status of AC bus 4:	
7 Nature of the water:		7 State of circuit breakers:	
8 Cabin crew action:		8 Strength of radio transmissions:	
9 State of cabin lights:		9 EPR indication available:	
10 Time, RWY and type of landing:		10 State of cabin lights:	

18 Self-correction

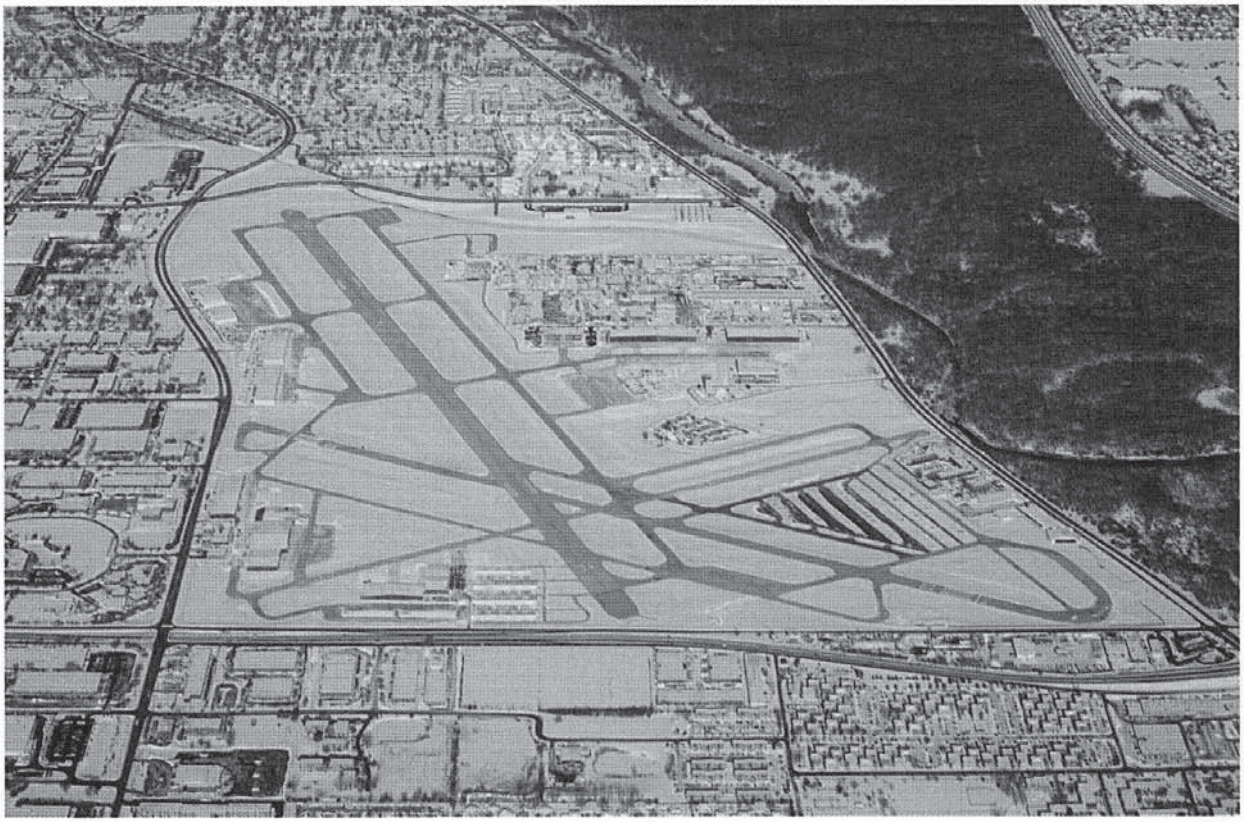
1 19:25 UTC / 19:35 UTC
2 On short final / On long final
3 Request vector / Request radial
4 Emergency landing / Precautionary landing
5 Outboard spoiler / Inboard spoiler
6 One dot below / One dot above
7 2,395 m / 3,395 m
8 3° slope / 2.3° slope
9 Medium braking action / Poor braking action
10 Crossfeed valve fault / Crossbleed valve fault

25a, b Debriefing Flight NZ 60



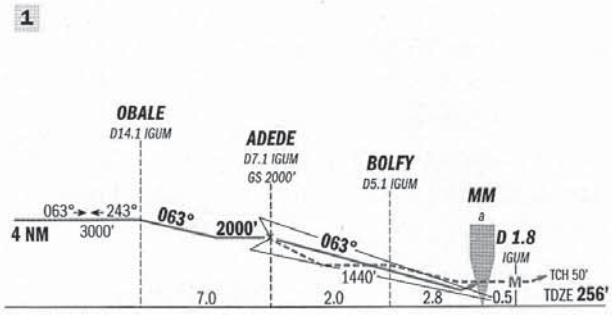
Unit 10

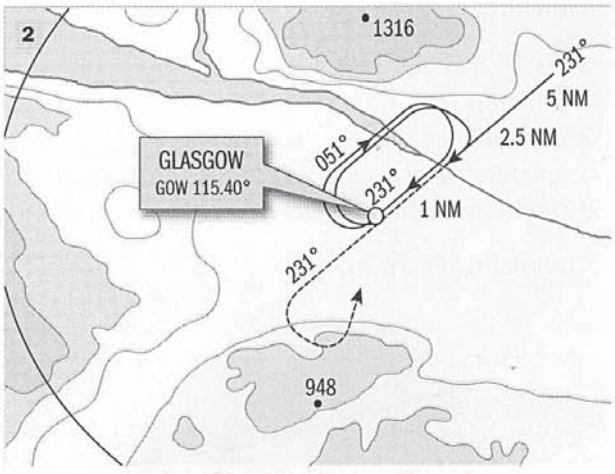
13 Airfields from aloft



16a Describing a process

1 Describe the step-down approach to Guam International in chart 1 and ask your partner to draw the vertical profile.
2 Describe the flight path of the flight towards Glasgow airport in diagram 2 and ask your partner to draw the horizontal flight path.





18a VOR DME approach

Leave VOR (SKA) to establish Radial 186° (DPN), maintain FL 65. After passing IAF 15 miles DME, turn left to fly DME arc of 13 miles DME, passing Radial 213°, descend to 2,600 ft. Crossing lead radial (270°) turn right to establish final approach track 107° (Radial 287°). At FAF, 6.3 DME, descend to MDA.

25 Proposing a choice

1 make a low pass / land immediately
2 stop on the runway / try to exit
3 assistance / taxi directly to gate
4 jettison and land / remain in the hold
5 approach from north/south

PILOTS

Unit 1

5b Pilots Information and requests for readback

1 Malaysian 261, request ILS approach Runway 31 Left
2 Air Canada 178, holding point B1, ready for departure
3 Iberia 576, traffic in sight, going around
4 Requesting departure information
5 Midland 3862, cancelling IFR, estimated time of arrival 15:36
6 China Southern 258, requesting autoland Runway 13 Left for training
7 Tarom 761, request start-up, destination Bucarest, Information Lima
8 Qantas 2877, we have two injured passengers on board and request medical assistance at the stand
9 Lan 339, we have ingested a foreign object during taxiing and request return to apron for maintenance inspection
10 Pan-pan, pan-pan, pan-pan, Saudia 548, we have had a flame-out on our Number 2 engine and are returning to CDG for precautionary landing, request ILS approach for Runway 08L

10c Pilots Questions/answers

Questions	Answers
1 Runway in use	1 238
2 Reason for delayed departure	2 19:40
3 Local time	3 A380
4 Runway length	4 At the intersection of TWY T and K
5 Gate number	5 Engine flame-out
6 When expect higher	6 Woman / acute stomach pains
7 Braking action	7 68 tonnes
8 Location of windshear	8 in and out of cloud, light turbulence
9 Turn-off / use on landing	9 Affirm
10 Current RVR	10 in ten minutes
11 Time in hold	11 Cabin crew giving oxygen, unconscious, not in pain
12 Wind direction and speed	12 Ambulance and paramedics

18 Pilots Checking mechanisms

1 Your transmission is broken up.
2 We ran into some severe turbulence near Melbourne.
3 We're on top of a solid overcast.
4 Please give us five miles behind the heavy.
5 There are five passengers with head injuries and what appear to be broken ribs after that patch of severe turbulence.
6 I'm breaking off this approach.
7 There is a suspicious passenger which the cabin crew are concerned about.
8 I'm not sure we can hold for 30 minutes more.
9 My First Officer is incapacitated.
10 Our flaps won't extend; we'll be making a fast landing.

Unit 3

10 **Pilots** **What is happening?**

1
cargo loading system U/S / called Engineering
replace drive motor
30 minutes

2
departure delayed / cabin attendant ill
wait / replacement crew member
will arrive / 15 minutes

3
received 25 additional pax from cancelled flight
uplifting + 3 tonnes fuel
will / ready / get away / 10 minutes

4
mechanic / found deflated tyre
change tyre
will have completed wheel change / 5 minutes

17c **Pilots** **Being more precise**

1 I think we're near Runway 17.
2 I can hear a noise.
3 I can see something in the fog ahead.
4 There seems to be a problem in the cabin.
5 We need emergency services.
6 Something has just hit us.
7 We are holding.
8 We have an obstacle in front of us.

20c **Pilots** **Managing a fire emergency**

CTL: –
F/O: (readback)
F/O: Copied / problems with engine / check maintenance / See anything?
F/O: Thanks
F/O: Stopping. RH engine shut down. Still on fire?
F/O: (readback)

23 **Pilots** **Managing a departure**

Time	Cue	Time	Cue
14:22	Request pushback and start-up	15:01	
14:22		15:01 15:05	Readback Low hydraulic pressure. Request return to gate
14:23	ETD?	15:05	
14:23		15:05	Negative
14:55	Request pushback and start-up	15:06	
14:55		15:07	Request maintenance at gate
14:55	Readback. Request taxi instructions	15:07	
14:58		15:07 15:25	Will advise Engineering estimates work 2 hours. Disembark pax
14:58 15:01	Readback Taxiway blocked	15:25	

Unit 4

8 **Pilots**

1 Requesting information, confirmation or clarification

1 Iberia 7455, end Taxiway E, heading north, painted markings, taxiways left and right not clear, assist?
2 Giant 2375, last transmission garbled, please say again / *[read back the response]*
3 Astana Line 268, confirm RWY 23R active, both 23R and 23L high-intensity lighting
4 Air France 4396, east end TWY R, access TWY S2 closed, request instructions
5 American Falcon 782, say again
6 Eagle 979, lined up RWY 23L, from A1, #1 T/O?, ATR 72 entering RWY from A3, request instructions
7 Europa 282, end TWY C, access holding C1 RWY 28L obstructed / *[respond to question]*
8 Malev 581, holding A2 RWY 31L, ready for departure, departures seem A1, confirm
9 Meridiana 464, last message garbled, say again / *[read back the response]*
10 New Zealand 095, our chart shows taxi via G, J and L to holding B2 RWY 36L, confirm

2 Giving information, confirmation or clarification

1 Crossed over intersection K and R, missed left turn, unsure of taxi routeing
2 Singapore A380
3 Engine lubrication problem, require maintenance
4 Earth and stones from contractor's truck spilled on paving, afraid of ingestion, request alternative routeing
5 Short-circuit in galley, circuit breaker pulled by cabin crew, situation under control, no fire or damage
6 Intoxicated group of 20 football supporters disturbing other passengers, cabin attendants unable to quieten them or keep them in their seats, will have to return to the gate, request police presence
7 Jet Blue A320, nose wheel in the grass up to axle, three metres from paving, aircraft blocking taxiway
8 Snow drifts and ice patches, strong wind, taxiing with caution
9 149 passengers, 6 crew members
10 Cabin attendant slipped in galley and cut her head during braking, concussion, require replacement

22 **Pilots** **Explaining non-compliance**

1 Explaining non-compliance

1 #4 engine N2 fluctuating / requested Engineering / remain apron
2 almost zero visibility / thick fog / not sure position / seem be TWY K / assistance
3 Learjet / still / RWY 05R / missed / turn-off C3
4 1 pax missing / ramp unloading baggage / ready five minutes
5 Holding point A2 / see Regional Embraer / holding point A3 / starting / line up / RWY 26R
6 Wait too long / ice and snow building up / wings / require de-icing again / ten minutes
7 works and vehicles / side of Apron F / not taxi / near / side / outer taxiway
8 Radio Management Panel faulty / intermittent transmissions / not change frequency / remain on 121.65

2 Requests

1 Jamaica 496, requesting nose-in stand due full load, adverse weather and late arrival
2 Uzbek 560, stopped on Taxiway R, request taxi via N and T, because S blocked by B787
3 Varig 845, stand B19, request departure information
4 Virgin 2336, request backtrack from B2 Runway 17L for departure
5 Argentina 747, request taxi to maintenance area via F and J
6 Cedar Jet 339, stand 28, Information E, QNH 1023, request start-up
7 Pollot 345, QNH 986 hPa, request TWY G and backtrack RWY 03
8 New Zealand 442, stand 35, QNH 1009, request pushback

Review A

4b **Pilots** **Fluency**

1 I'm afraid we're not ready to push back for the moment.
2 One of the cabin attendants is not feeling very well; we may have to disembark her.
3 Delta 4693, we are taxiing towards Runway 31L. We have just had an electrical caution.
4 We're at the intersection of Taxiways November and Tango, but we are unable to proceed.
5 There's someone walking on the taxiway. He looks rather suspicious.

6b **Pilots** **Departure scenario**

Alitalia 3845, A320, Madrid Barajas to Rome, scheduled departure 09:05

09:03	Tower, request pushback and start-up approval	09:40	read back
09:05	acknowledge	09:44	Barajas Tower, Taxiway T, cabin crew reported pax with panic attack
09:22	acknowledge	09:46	Negative. Pax very agitated
09:27	negative. Tow-bar broken during pushback. Waiting new tow-bar	09:48	return to gate. Request instructions
09:36	pushed back. Engines started. Request taxi instructions	09:50	read back
09:38	read back	09:53	request ambulance and baggage handlers to unload pax's baggage

Unit 5

22 **Pilots** **Clarification and rephrasing**

Pilot cues

1 We are executing a missed approach.
2 Would you please amend our flight plan?
3 We are showing a lot of weather 40 miles ahead.
4 Ice is building up on our wings.
5 Estimating Lima at 18
6 Will you give us a longer circuit?
7 What is the current braking coefficient?
8 We are showing an overheat on number one.
9 Has the snow been cleared off Runway 27L recently?
10 I didn't get that.
11 Is there any standing water on Runway 32R?
12 Can you give us the latest update on the ash cloud?

26 **Pilots** **Unable to comply**

Response

1 Unable / ILS display / seems / unreliable / fluctuating / following lightning strike
2 Negative / still / thick cloud
3 Negative / not enough fuel / another pattern
4 Negative / intermittent transmission / problems / receiver / suspect antenna damage in hailstorm
5 Unable / prefer / longer Runway 35R / icy conditions / poor braking action
6 Negative / severe obscuration / dust storm
7 Unable / cracked windshield / vertical speed / cannot exceed / 1,000 ft/min
8 Unable / weather radar / displaying / large CB / 40 miles / SW

Input

1 We are starting to have an ice build-up on our leading edges. Request a lower level.
2 Can we make a tight circuit?
3 Request Douala direct.
4 Request ILS approach Runway 31 Left.
5 Can we increase our rate of descent?
6 Can you give us radar assistance to Kaduna?
7 Request ILS approach Runway 24 Right.
8 Request level change instead of orbiting as delaying action.

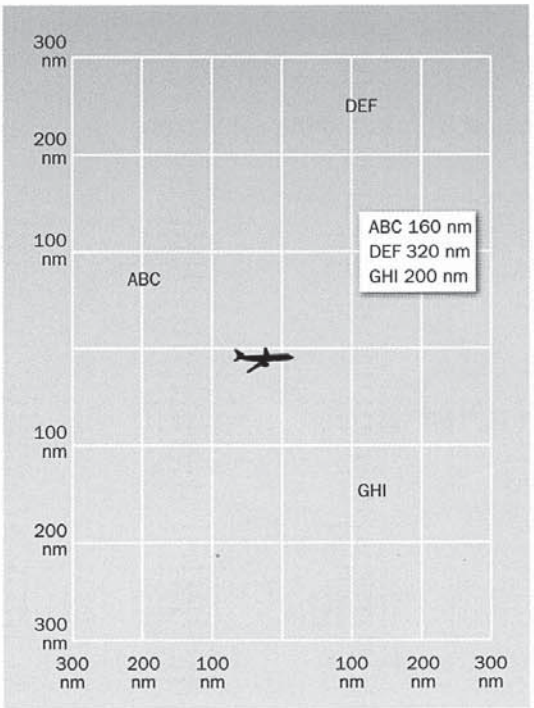
Unit 7

9a Pilots What should we do?

07:05: Royal Jordanian 117, A321, FL 370, from Amman to Paris CDG. Request FL 390 from Athens ACC	07:38: Contact Brindisi ACC. Doctor more concerned about patient's condition. Request suitable alternates and weather conditions. If condition worse, will have to divert
07:10: FL 390. Contact Athens ACC – passenger unconscious, difficulty breathing, being given oxygen by cabin crew	07:51: Contact Rome ACC. Medical emergency, need to divert to nearest suitable airport with good local medical facilities. Request present conditions
07:12: Doctor on board attending pax; situation seems under control. If condition stable, continue to scheduled destination. If condition worse, contact ACC for possible alternates	07:53: Decision to divert to Rome Fiumicino. Request medical assistance
07:31: Contact Brindisi ACC. Brief ACC on cabin situation and intentions	07:55: Read back and thanks

13a Pilots Deciding on a diversion

You are the captain of a Boeing 773 (777-300 ER) flying eastbound at FL 390 and Mach 0.85 with 264 passengers and 11 crew members on board after two hours of flight and with seven and a half hours of flight remaining. Your current weight is 274 tonnes and your maximum landing weight is 251 tonnes. You have just experienced severe vibrations and loss of thrust from Engine 2 and suspect bearing failure. The engine is idling. You need to divert and have found three possible diversion airports on your chart: ABC, DEF and GHI. Contact Area Control and obtain information about these three aerodromes and discuss the best alternative with the controller.



16 Pilots Reporting, asking about and describing an unusual situation

Situations

1 Windshield broken by hail 2 Smoke detected in one of the toilets 3 Cabin attendant taken ill
4 Followed a TCAS RA 5 A passenger claiming to have a bomb on board

Cues for questions

1 location of airspace? / duration of closure? / reason for closure? / military activity? / instructions for re-routeing?
2 which runway in use? / impact on traffic? / expected delays? / length of runway in use? / ILS capability?
3 effect on communications, radar, traffic management? / impact on our flight? / delays? / deviations?
4 location? / duration? / level? / type of activity? / need to divert?
5 when normal flow resume? / impact on flight? / change to ETA? / reason for restrictions? / delaying tactics expected?

18 Pilots Asking and saying why

1 Instruct us to increase speed
2 The ILS inoperative
3 Runway 32R closed
4 So much holding
5 No higher level available
6 Change VOR
7 Cannot proceed direct to Tashkent
8 Request us to do a 360
9 Need to change frequency
10 Divert to Manchester

19b Pilots Are you able?

You are the captain of Aer Lingus 137, an Airbus 330 bound for Boston from Dublin. You contact Gander ACC, Newfoundland, Canada, after your cabin crew inform you that there is a troublesome passenger threatening them and another passenger.

1 FL 380 – unruly male passenger
2 Attacked another passenger – got up, moved around the cabin, insulted the cabin crew
3 Affirm – cabin crew restrained
4 Affirm – if remains restrained – cabin crew informed me man claiming bomb in hold
5 Need divert ASAP – provide suitable airports for immediate diversion
6 Able give me RWY specs and conditions at Charlottetown?
7 Negative
8 RWY 10 too short. Can give me details for Halifax?
9 Affirm. Clear us to CYHZ
10 Acknowledge – able advise police and security services at Halifax?

21b **Pilots** **Intentions role-play**

1 Engine 3 flame-out passing FL 275
2 Negative. Continue to destination, unless further deterioration. Monitoring other engines. Attempt relight
3 Unable relight #3. Reduced rate of climb. Unable cross Erzurum at 48. Estimate Erzurum 52. FL 330
4 Negative. Northerly route via Kars, Gyumri and Ganja
5 More frequent aerodromes if need divert
6 Present position: 30 nm W Ganja. Cabin attendant fell. Head injury
7 Negative. Divert to Ganja. Request RWY in use, local conditions, ATIS and medical assistance
8 Acknowledge and thanks

24 **Pilots** **Managing a developing situation**

You are the flight crew of a Japan Airlines Boeing 777-300ER, Japan Air 401, with 246 passengers on board. You are one hour out of Tokyo bound for London Heathrow. Sapporo ACC has just handed you over to Khabarovsk ACC. You are heading 340° at FL 310.

UTC	Japan Airlines 401
12:46	Contact Khabarovsk ACC – large CB 30 nm ahead; request turn right 20°
12:47	Turn right 360°
12:53	Encountered hailstorm and severe turbulence; small crack on RH outer windshield; some pax and cabin crew injured
12:55	Windshield damage not seem serious, monitoring. 7 pax with head injuries, concussion, suspected broken ribs, 1 attendant unconscious. Wish to make precautionary landing. Alternates?
12:58	Request weather
13:00	Route to KHV
13:04	PAN call; windshield broken; whistling noise; partial depressurisation; precautionary descent and landing ASAP
13:06	Nearer alternate?
13:07	RWY, facilities, weather?
13:09	Announce your decision; reducing speed and rate of descent; ETA 13:41; request long approach and medical assistance on arrival
13:11	Pressurisation stable, small rise in cabin altitude; pax comfortable, crew member regained consciousness; descending 1,000 fpm, Mach .75, passing FL 240. Thanks

Unit 8

10 **Pilots** **Concern and advice**

1 worried / shifting wind direction / RWY 07
2 thought / controller said / ILS approach to RWY 31L
3 strange / ATC instructed us / approach / from south
4 concerned / our radio-altimeter readings
5 afraid / not enough fuel reserves / hold 30 minutes
6 not sure / be visual / 350 ft
7 strange / those lights on the right / looking so close
8 worried / are too high
9 concerned / terrain at 3,000 ft / to the east
10 afraid / not yet stabilised

13 **Pilots** **What will you do?**

Situations

1 We have to make an emergency landing on 08.
2 Our nose landing gear doesn't seem to have extended.
3 We need to expedite our approach.
4 We need to alert our maintenance base.
5 Request medical assistance for twelve passengers on arrival.

Responses

1 divert / Tashkent
2 make / VFR / approach
3 shut down the engine and divert / Merida
4 continue / flight
5 divert / our alternate / 20 minutes

17b **Pilots** **Confirming with reported speech**

1 have / 246 pax on board
2 passing 6,000 ft
3 flying 9 DME arc from IAF
4 have / 25 minutes' fuel endurance
5 difficulty / stabilised approach
6 reduce / minimum clean speed
7 Mayday, Mayday, Mayday, Tower, Kyrmal 397, engine flameout. Will attempt to land military field 8 miles west.
8 windshear at 1,000 ft / airspeed loss 20 kts / strong right drift

20 **Pilots** **Avoiding runway excursion**

1 landing heavy / request RWY 13 conditions
2 request ILS approach / RWY 12
3 indicated on glide slope / GPWS terrain warning
4 concerned / obstacles / on / flight path
5 runway condition / RWY 25 / braking action
6 strong crosswind / difficult / maintain / ILS
7 seems to be / vehicle / far end / RWY
8 impossible / extend flaps > 15° / high speed / full load / snow-covered runway

25a **Pilots** **Approach role-play**

21:14	*Alphajet 473, F/O PF, starting your final descent to RWY 23L for the first time after a 9-hour flight. RWY 23L is indicated as 'slippery when wet'.* Contact Approach on 119.8
21:16	read back
21:17 (2)	acknowledge
21:18	acknowledge
21:25	final turn; visual contact
21:26 (2)	*Crew busy resetting autobrakes and flaps, missed Approach transmission*
21:28 (1)	final approach fix 1,600 ft, 174 kts
21:28 (3)	continue
21:29	read back
21:30	*a/c crossed threshold 80 ft too high, 170 kts (15 kts higher than VRef), sink rate of 600 ft/min. Captain orders go-around, but a/c touches down 1,150 m past the threshold. Captain changes mind and initiates reverse thrust. The a/c passes the end of the runway at 74 kts, collides with an ILS antenna, slides on the wet ground and comes to rest in a hollow 220 m past the end of the runway not visible from the Tower. The nose gear collapses. Only minor injuries, but material damage and a/c nose down.*
21:32 (1)	Report overrun; describe precise position, condition of pax and crew and request assistance
21:37	*No sign of assistance.* Call and confirm position
21:39 (1)	advise decision to conduct precautionary evacuation

Unit 9

4b **Pilots** **Reporting technical failures**

1 Faulty cabin pressurisation
2 Engine 2 shutdown
3 Loss hydraulic system
4 Autopilot disconnect
5 Captain probe heat failure

20a **Pilots** **Updating**

Situation 1

- 15:27 UTC, Gulfair 571 (to Bahrain ACC), A320, descending FL 290 en route Dubai. AC bus failure, request lower to start APU
- 15:38 UTC, FL 190, APU running, electrical power normal
- 15:42 UTC, FL 190, AC Essential Feed fault, load shed, emergency power configuration, request diversion for precautionary landing Bahrain, 116 pax
- 15:55 UTC, 8,000 ft, RAT extended, request VFR approach RWY 12L
- 16:03 UTC, 4,000 ft, forward cargo smoke detection, extinguisher discharged, request fire and emergency services on ground
- 16:05 UTC, stabilised, runway in sight, smoke warning out

Situation 2

- 19:21 UTC, China Eastern 794 to Zhengzhou Tower, B737-700, 3,000 ft on departure from Zhengzhou RWY 29R, bird strike, 1,600 ft, Engine 2 surge and severe vibrations, idle power, request return for precautionary landing.
- 19:22 UTC, Engine 2 shut down, standby hydraulic system operating, request vectors for ILS approach RWY 29R
- 19:24 UTC, PTU failure, loss of outboard spoilers and trailing edge flaps, braking downgraded, manoeuvrability reduced, request RWY 29L for longer landing distance
- 19:25 UTC, if RWY 29L not available, will go around to prepare another approach
- 19:35 UTC, on long final, RAT extended, some functions recovered, partial flap extension, one dot above glideslope
- 19:37 UTC, two miles out, runway in sight, stabilised, VRef +15

Unit 10

5c **Pilots** **Making requests and announcing a compulsory action**

Requests

1 Request ILS approach Runway 26 Right
2 Request higher
3 Request priority landing
4 Request turn right heading 140°
5 Request radar surveillance approach
6 Request ILS approach Runway 14 Left
7 Request direct Karaganda
8 Request vectors ILS approach Runway 07 Right
9 Air France 765, downwind, request touch and go
10 Request change to 125.350

Responses

1 Hydraulic fault / 10 minutes / hold / MSA / checklists
2 Strong headwinds / estimate ALBA at 25
3 Cabin crew reported / passenger very severe chest pains / expedite approach
4 Minimum Safe Altitude / 4,000 ft / present position
5 Frequency selector faulty connection / remain this frequency
6 G/S reading unreliable / Visual approach
7 Cumulonimbus to SE / continue present heading and orbit
8 Flap jam / flapless approach / minimum clean speed
9 TCAS RA / descending
10 Hydraulic fault / loss of autobraking / use longer runway or divert

9 **Pilots**

09:16	Nairobi Approach, maintaining altitude 4,000 ft. Request precautionary landing / due / unruly passengers, threatening cabin crew. Belligerent football fans on board	09:24	Passenger / head / cut and bruised. Cabin crew / treated him. All passengers / agreed / sit. Request ambulance at the gate
09:18	Read back	09:26	Read back
		09:30	Read back
09:20	Negative. One passenger injured. Crew / contained / passengers / rear cabin. Request police on arrival	09:36	Police and ambulance / positioned themselves / at gate yet? Cabin crew / prevented / additional violence. Request / police / enter by aft left cabin door
09:22	Affirm. Cabin crew / managed / persuade most passengers. I spoken / passengers / PA. Alerted police?		

23a, b **Pilots** **Managing threatening conditions**

- Air China 2539, A330-200 from Beijing to Manila
- 197 pax
- FL 080, holding
- Hydraulic failure: loss of autobraking
- 3 pax with concussion due turbulence in cruise
- Crew on extended duty due 2-hour delay leaving Beijing
- Planned for ILS approach to RWY 06

Review C

6 **Pilots** **Interaction**

time		time	
03:46	Indonesia 088 (to Ankara ACC), B777-300ER, FL 390 en route Amsterdam from Jakarta. Engine #1 oil level decreasing; monitoring engine performance; request lower to start APU and consider diversion for precautionary landing	04:14	Read back
03:58	FL 210, APU running, Engine #1 reduced thrust	04:16	Read back
04:00	Prefer continue to Istanbul to connect with code-sharing partners	04:21	A very agitated passenger at prospect of landing in Turkey, causing disturbance in cabin
04:07	Engine #1 low-oil-pressure warning. Engine at flight idle. Request diversion for precautionary landing at nearest alternate, 214 pax.	04:23	Negative. Pax in transit only. Will not pass immigration.
04:09	Request coordinates of Esenboga International Airport, Ankara	04:26	8,000 ft, request ILS approach RWY 03R
04:11	Read back. Request weather	04:35	LLZ captured, stabilised, runway in sight

ATCOs

Unit 1

5b **ATCOs** **Instructions for readback**

1 Air France 475, report ready for pushback
2 KLM 463, taxi to holding point Runway 28
3 Japan Air 582, hold position
4 Aeromexico 394, cross Runway 09
5 Malaysian 356, contact Tower 118.375
6 Air China 2374, reduce speed to 210 knots
7 American 229, report runway lights in sight
8 Varig 463, make straight-in approach Runway 26, wind 290 degrees, 12 knots
9 Aeroflot 35, you are number two for landing, report short final
10 Emirates 468, climb to altitude 3,000 feet on runway heading

10c **ATCOs** **Questions and answers**

Questions	Answers
1 Passengers on board	1 27R
2 ETD	2 Snow removal on departure runway
3 Aircraft type ahead of you	3 23:17
4 Present location	4 4,185 m
5 Reason for diversion	5 B25
6 Problem in the cabin	6 in 20 miles
7 Endurance	7 Threshold and midpoint: medium; stop end: poor
8 Weather conditions	8 1 nautical mile from touchdown
9 F/O / qualified / CAT III	9 D2
10 When / ready	10 450 m
11 State of sick passenger	11 20 minutes
12 Assistance on arrival	12 070°, 6 kts, gusting 10 kts

18 **ATCOs** **Checking mechanisms**

1 There is a chance of hailstorms beyond Abbotsford.
2 You're gaining on the traffic ahead.
3 Orbit right due traffic in the Bangalore area
4 Do you need to dump fuel?
5 I won't show you again until after Limoges.
6 Look out for the slow-moving traffic ahead of you.
7 I'll have your clearance shortly.
8 We'll be able to update you in the next couple of hours.
9 How is your passenger with the heart attack doing?
10 Quiet hours become effective at 23:00 Zulu.

Unit 3

10 **ATCOs** **What is happening?**

1
engineer / do now?
when / expect / ready / push back?

2
you / do / now?
when / she / arrive?

3
you /do as a result?
when / ready / get away?

4
he / do / now?
how long / will / take / complete / wheel change?

17c ATCOs Being more precise

1 There are some delays.
2 The weather is deteriorating.
3 We have limited radar coverage.
4 There aren't a lot of service vehicles available.
5 There is traffic stopped on the outer taxiway.
6 I think there was an error in the taxi instructions I gave you.
7 The snow ploughs are removing the snow and all departures are on hold for the moment.
8 You will have to park at an outlying stand.

20c ATCOs Managing a fire emergency

CTL: Hijet 451, Outer Taxiway, Stand 17
CTL: Hijet 451, for info, landing / flame / RH engine
CTL: Smoke + flames exhaust / fire brigade coming / LH side
CTL: Hijet 451, stop
CTL: Affirm. Shut down all engines.
CTL: Frequency 121.85

23 ATCOs Managing a departure

Time	Cue	Time	Cue
14:22		15:01	Alternative routeing
14:22	Departures on hold due RWY 29L closed	15:01 15:05	
14:23		15:05	Steering affected?
14:23	15:00	15:05	
14:55		15:06	New taxi instructions
14:55	Approved. Push back facing east	15:07	
14:55		15:07	Confirm. Disembark pax?
14:58	Taxi instructions for holding point C Runway 36R	15:07 15:25	
14:58 15:01		15:25	Sending coaches

Unit 4

8 ATCOs

1 Giving information, confirmation or clarification

1 G3 left, G4 right, turn right, taxi via G4, hold short RWY 27R
2 Giant 2375, taxi holding B4, RWY 15 via TWY D
3 Affirm, RWY 23R active, lighting maintenance RWY 23L
4 TWY S2 closed, drainage work, turn left, taxi T3, turn right S3, hold position RWY 13R
5 Current information F, QNH now 996 hPa, after B747 passing right to left, taxi holding A2, RWY 09
6 Hold position, cancel T/O, acknowledge, ready after departure ATR
7 Affirm, instructed you taxi via D and C to holding C2, stop bar C1 being repaired, able 180?
8 Affirm, all departures holding A1 RWY 31L, distance available from A2 sufficient? Otherwise hold position, backtrack A1 when RWY vacated
9 Via holding D1, line up and wait RWY 25R, 1 a/c depart before, holding D2
10 Negative, I say again: taxi via H, K and R to holding B1 RWY 36R, construction work near J and L

2 Requesting information, confirmation or clarification

1 Reason stopped TWY K?
2 Aircraft type and airline of traffic ahead?
3 Reason returning to gate?
4 Nature and location of obstacle on TWY?
5 Location, extent and status of smoke in cabin?
6 Behaviour of unruly passengers and your intentions?
7 Condition of aircraft bogged down off the TWY?
8 State of TWY surface intersection Q and T?
9 Number of passengers if need to disembark?
10 Confirm need and reason for medical assistance

22 ATCOs Explaining non-compliance

1 Instructions

1 Singapore 977, taxi to holding point C2 Runway 27L via G and C. Hold short of 27L.
2 Japan Air 389, taxi to Terminal via Taxiways I and J.
3 Regional 553, line up and wait Runway 05R.
4 Lan 475, push back to face north.
5 Emirates 379, behind A320 on short final, line up behind.
6 Air China 3871, taxi to holding point C2 RWY 05R, #8 in line, expect departure in 25 minutes.
7 KLM 5438, pull in to let ANA 747 pass.
8 Air Canada 2573, contact Ground inbound 121.9.

2 Explaining non-compliance

1 all nose-in stands occupied / taxi to M24
2 trench being dug along TWY T / closed / taxi holding point A3 RWY 27 L via TWY N, O and P
3 ATIS unavailable / wind 210° / 6 kts / QNH 1017 / departure runway 19L
4 Air France A340 lining up on 17L from B1 / You are #3
5 Juliet closed for lighting maintenance / taxi via G, H and I
6 RWY 34R closed while triple seven being towed
7 Malev 737 lining up on RWY 03 / taxi to holding point E2 via G and H
8 Lufthansa A380 on apron / waiting for stand to be vacated

Review A

4b ATCOs Fluency

1 We are having some problems with our computer which may affect turnaround and departure.
2 The stand you were scheduled to occupy is unavailable, I'm afraid.
3 Baggage handling is being affected by industrial action. You should expect some difficulties.
4 Departures have been stopped while the snow clearance vehicles work on the runway.
5 You will not be taxiing to the main passenger building due to the suspected terrorist you have on board.

6b ATCOs Departure scenario

Barajas Tower handling Alitalia 3845, A320, to Rome, scheduled departure 09:05

09:04	unable. Approx. 15-minute delay in departures due traffic and RWY 18R closed	09:45	able calm pax?
09:21	pushback and start-up approval	09:47	intentions?
09:26	ready for taxi instructions?	09:49	turn right TWY R and taxi N. Stand by gate number
09:28	advise when ready for taxiing	09:52	taxi to outlying stand M23
09:37	taxi via M and T to holding point A2 RWY 18L	09:54	confirm
09:39	RWY 18L, wind 200°, 5 kts, gusting 8 kts, QNH 1021		

Unit 5

22 ATCOs Clarification and rephrasing

ATCO cues

1 Are the runway lights in sight?
2 Be advised that you may get some wake turbulence when passing behind the A380.
3 Several flights have reported mountain wave effects over the Carpathians.
4 I've got an A320 climbing to 290, but he should be passing 210 at the moment.
5 We'll check that out.
6 We show you heading north-east.
7 Can you give us an update on your ice build-up?
8 There's occasional light chop at FL 290.
9 You're going to be about 20 minutes in the stack.
10 We'll be able to give you higher shortly.
11 What does your weather radar return look like?
12 Are you squawking 6314?

26 ATCOs Unable to comply

Input

1 Report established on localizer.
2 Are you visual?
3 Are you going around?
4 Did you read my previous transmission?
5 Cleared for ILS approach Runway 35 Left.
6 Have you got the aerodrome in sight?
7 Commence your descent to cross Smolensk at FL 180.
8 Turn left heading 240 degrees.

Response

1 Unable / due / traffic / expect / lower / 5 minutes
2 Negative / Dash 7 / declared emergency / bird strike / short final / RWY 07
3 Unable / traffic restrictions / military exercises / Yaounde area
4 Unable / RWY 31L closed / due flooding near threshold
5 Negative / traffic ahead / 3,000 ft / you #3 / arrivals delayed / windshear / threshold
6 Unable / coverage / extends / only / Bida
7 Unable / fog thickened / RWY 24R / below minimums
8 Unable / heavy traffic / due / diversions and thunderstorms

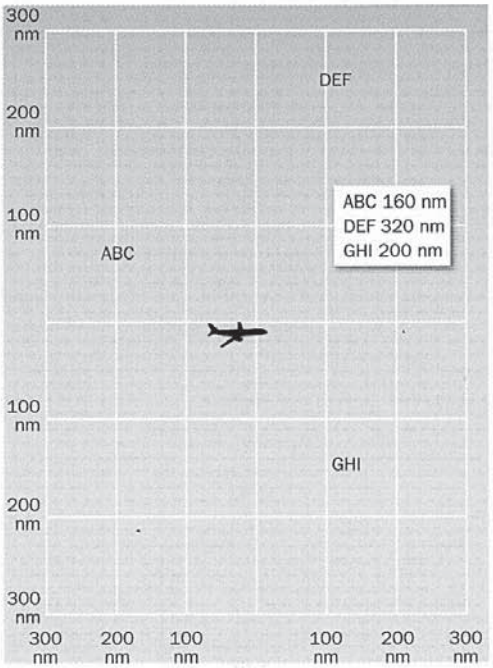
Unit 7

9a ATCOs What should we do?

07:06: ACC. Instruct flight to higher level	07:39: Brindisi ACC. Alternates: Bari (60 nm SSW); Pescara (110 nm NNW); Rome (220 nm W); Forli (260 nm NW); Bologna (300 nm NW)
07:11: Acknowledge. Request intentions	07:52: Rome ACC. Rome Fiumicino – Wind 190°, 12 kts, gusting 16. Visibility 8 km SCT 6,000 ft. Temp. 18°, dew point 16°. RWY 16L landing runway
07:13: Handing over to Brindisi ACC at 19. Contact Brindisi ACC 124.750	07:54: Turn left heading 260°. Expect descent at time 58. Will advise medical services
07:32: Brindisi ACC. Request kept informed. Will prepare possible alternates info	

13a ATCOs Deciding on a diversion

You are an Area Controller with three aerodromes in your region. You will be contacted by the pilot of an eastbound aircraft which has encountered a technical problem. Provide the pilot with the information he or she requires about the three aerodromes so that he or she can make a decision about their diversion.



ABC

Distance and direction from current position	160 nm at 290°	Boeing engineering	line maintenance only
Runway length	3,120 m	Current visibility	600 m
Navaids	ILS CAT III	Current weather	Wind 130, 4 kts, rain, 6°

DEF

Distance and direction from current position	320 nm at 020°	Boeing engineering	repair station
Runway length	2,700 m	Current visibility	400 m
Navaids	ILS CAT II	Current weather	Wind 170, 16 kts, snow showers, 1°

GHI

Distance and direction from current position	200 nm at 135°	Boeing engineering	line maintenance only
Runway length	3,460 m	Current visibility	3 km
Navaids	ILS CAT IIIC	Current weather	Wind 120, 15 kts, rain showers, 7°

16 ATCOs Reporting, asking about and describing an unusual situation

Situations

1 An airspace closure 2 Single runway operations 3 Our main computer is down
4 Military traffic in your area 5 Expect flow management restrictions in 20 minutes

Cues for questions

1 injuries? / which windshield? / cabin depressurisation? / intentions? / emergency descent? / divert?
2 under control? / smoke in cabin? / which toilet? / action taken? / intentions?
3 severity of illness? / doctor on board? / nature of illness? / enough cabin attendants? / need to divert?
4 current altitude? / traffic in sight? / returning to original level? / advisory disappeared?
5 location of bomb? / description of passenger? / passenger armed? / impressions of cabin crew? / intentions?

18 ATCOs Asking and saying why

1 Make an emergency descent 2 Change heading 3 Reduce your speed
4 Request a higher level 5 Want to expedite your approach 6 Go around 7 Want to divert
8 Want to jettison fuel 9 Lost your main instruments 10 Request assistance

19b ATCOs Are you able?

You are an area controller at Gander ACC in Newfoundland, Canada. You are contacted by Aer Lingus 137, an Airbus 330, which has a problem on board. Manage this problem with the captain.

1 What way unruly? What done?
2 Restrain him? Situation under control?
3 Continue to Boston?
4 Your assessment of situation? Able to continue or wish divert?
5 Charlottetown, Prince Edward Island, 60 nm / Halifax, Nova Scotia, 180 nm / St. John, New Brunswick, 220 nm
6 Charlottetown (CYYG) 46° 17' 21" N, 063° 07' 21" W, RWY 03/21 2,134 m; RWY 10/28 1,525 m. Wind 110°, 18 kts, gusting 28 kts, temp 19°, dew point 17°, CAVOK, RWY 10 in use. Able?
7 Why?
8 Halifax Stanfield International (CYHZ), 44° 52' 51" N, 063° 30' 31" W; RWY 05/23 2,682 m; RWY 14/32 2,347 m. Wind 120°, 16 kts, gusting 22 kts, temp 20°, dew point 19°, BKN 4,000 ft. RWY 14 in use. Able?
9 Turn left heading 210°. Expect descent at 25
10 Affirm. Acknowledge

21b ATCOs Intentions role-play

1 Intentions? Return to land?
2 Acknowledge
3 Acknowledge. Intentions after Erzurum? Continue to Baku via Erevan?
4 Reason for northerly route?
5 Turn left HDG 070°
6 Intention? Continue to Baku 200 nm?
7 Acknowledge. RWY in use 30. Wind 270°, 3 kts. CAVOK, temp. 31°, dew point 23°, QNH 1009

24 ATCOs Managing a developing situation

You are an Area Controller at Khabarovsk ACC in far eastern Russia, north of Japan. You are contacted by a flight coming from Tokyo Narita International airport.

UTC	Khabarovsk ACC
12:47	Turn right heading 360°
12:54	Windshield damage serious? Number of injured pax and crew? Intentions?
12:56	KHV / UHHH (Khabarovsk) international airport; 358 nm; magnetic track 269; RWY 05R 23L 4,000 m; ILS CAT III; Boeing spares; university hospital; connecting flights to Moscow and Tokyo; coordinates 48° 31' 41" N, 135° 11' 18" E
12:59	Wind 070/09 G 16, CAVOK, temperature 4°, dew point 2°
13:00	Turn left heading 270; expect lower FL 220 at 15
13:05	FL 180
13:06	KUU (Yuzhno-Sakhalinsk), 72 nm south-east, 46° 53' 13" N, 142° 43' 19" E
13:08	RWY 01/19, 3,400 m, concrete, regional airport, no Western a/c technical support, wind 170/08 G 12, visibility 2,000 m, overcast 600 m, 6°, dew point 6°, rain showers
13:10	Confirm; handover [your chosen destination] Approach 129.3 at 29. Maintaining pressurisation? Status of injured pax and crew?
13:12	Confirm. Out

Unit 8

10 ATCOs Concern and advice

1 not sure / Aeromexico 562 / which responded
2 worried / Air France 585 and 985 / similar call signs
3 thought / said RWY 26R not 26L
4 strange / not read back
5 afraid / too high on final
6 puzzled / his readback
7 afraid / 2 aircraft / converging flight paths
8 not sure / English very good
9 thought / Finnair 338 / Sector B
10 worried / Malev 497 / orbiting right not left

13 ATCOs What will you do?

Responses

1 position you / ILS 08 / 10 miles
2 if you / low pass / we / have a look
3 make you / #1
4 relay message / your base
5 advise / ambulances and paramedics

Questions

1 What will you do if the thunderstorm is still overhead the field on arrival?
2 The ILS is inoperative, I'm afraid. Say your intentions.
3 If your oil leak gets worse, what will you do?
4 What will you do if the warning does not come on again?
5 What will you do if the weather does not lift?

17b ATCOs Confirming with reported speech

1 RWY 15L / closed
2 cleared / ILS approach / RWY 21L
3 wind / veered / 240°
4 an industrial fire and fumes / 2 miles from touchdown / 1,000 m left of flight path
5 heavy rain / bright motorway lights / visibility more difficult / short final
6 caution: black hole effect in darkness / 3 miles to touchdown / bright city lights beyond RWY 31
7 if radio contact lost / unable continue approach / climb 2,500 ft
8 ice patches / reported / midpoint / RWY 04L

20 ATCOs Avoiding runway excursion

1 RWY 13 conditions / available width 34 m / patches / ice / braking action poor / snow along edges
2 ILS approach / Runway 12 / obstacle clearance altitude 700 m / maintain 2,000 ft / check minima
3 adjust your rate of descent / altitude / should / 900 ft
4 terrain rising / 862 ft / 500 m / left flight path / 3 miles / from threshold
5 RWY 25 wet / standing water / right-hand side / last 1,000 m
6 incoming flights / less crosswind / 500 ft to touchdown
7 go around
8 suggest / divert / LHR / approach 09L / 3,900 m available

25a ATCOs Approach role-play

21:15	Approach on 119.8: acknowledge and give weather update for RWY 23L: wind 250° / 10 kts; visibility 8 km; rain and thunderstorms in the vicinity; runway length available: 3,220 m
21:17 (1)	fumes from factory 4 miles from threshold and 1 mile from approach path carried by wind
21:18 (1)	high-intensity lights unserviceable on RWY 23R due maintenance works
21:20	heavy rain, visibility 2.5 miles
21:26 (1)	previous aircraft reported poor braking action on RWY 23L
21:27	Alphajet 473 #3 in approach. B767 on short final initiated a go-around
21:28 (2)	caution: heavy rain, runway wet, braking action reported medium. Intentions?
21:28 (4)	cleared to land RWY 23L. Wind 260, 11 kts
21:32 (2)	Respond to call and confirm action taken
21:38	Confirm time emergency services will take and type and number of services coming
21:39 (2)	Acknowledge

Unit 9

4b ATCOs Reporting technical failures

1 Glideslope U/S
2 Runway lighting low level
3 PAPI inoperative
4 Frequency congestion
5 Runway 27L closed

20a ATCOs Updating

Situation 1: Bahrain ACC

time		time	
15:27		15:55	RWY 12L used for departures, RWY 12R 2,530 m
15:38		16:03	
15:42		16:05	

Situation 2: Zhengzhou Tower

time		time	
19:21		19:25	
19:22		19:35	
19:24	RWY 29L not available due maintenance, RWY 29R 3,200 m	19:37	

Unit 10

5c ATCOs Giving instructions and announcing a compulsory action

Instructions

1 Cleared ILS approach Runway 21 Right.
2 Cross ALBA at 23.
3 Remain outside controlled airspace. Time is 18. Expect joining clearance 29.
4 Descend to altitude 3,000 feet.
5 Contact Tower 118.3.
6 Expect ILS approach Runway 17 Left.
7 Delaying action. Turn right heading 130°.
8 Decrease speed.
9 Climb to 5,000 feet.
10 Cleared ILS approach Runway 15 Right.

Responses

1 Runway 26 Right used for departures
2 Traffic. Expect at 45
3 Runway excursion. Landing runway closed for 30 minutes
4 Traffic in hold. Turn left 080°
5 Radar U/S
6 G/S transmitter maintenance. Visual approach
7 Military traffic. Via Almaty
8 Antonov precautionary landing. Expect ten minutes' delay
9 Traffic. Make full stop landing Runway 21. Cleared to land, surface wind calm
10 Frequency U/S. Remain on 126.325

9 **ATCOs**

09:15	Springbok 3571, report your level.	09:23	Affirm. Condition / injured passenger?
09:17	Turn left HDG 110°, intercept Localizer, cleared ILS approach RWY 06, QNH 1017	09:25	Confirm. Cleared / land / RWY 06 / Wind 080°, 4 kts
09:19	Cabin crew / got / passengers under control yet?	09:29	Springbok 3571, Nairobi Ground. Taxi to Stand 29, via Taxiway B
09:21	Confirm. Passengers returned / their seats / for landing?	09:37	Affirm. Steps / positioned at door / Stand by

23a, b **ATCOs** **Managing threatening conditions**

- Ninoy Aquino International Airport, Manila, Philippines
- RWY 06/24: 3,737 m; 13/31 2,258 m
- RWY in use 13
- QNH 992 hPa
- Wind 110°, veering 120°, 15 kts, gusting 21 kts
- Visibility 1,500 m, decreasing
- Overcast 700 ft, decreasing
- Rain showers, braking action poor
- Standing water on runway
- Thunderstorm 20 nm to SE
- 20 minutes holding due to diverted traffic

Review C

6 **ATCOs** **Interaction**

time		time	
03:47	Descend FL 210. Report on reaching and keep us advised of situation. Kayseri, Ankara, Istanbul possible alternates en route	04:12	Ankara Esenboga International Airport, Information Hotel at 03:00 Z, wind 050°, 4 kts, visibility 6 km, 2,800 ft scattered, 4,200 overcast, temp. 09, dew point 06, QNH 1007, ILS approach RWY 03R
03:59	Your intentions?	04:15	Contact Ankara Approach 118.2
04:08	Read back. Ankara Esenboga at 68 nm	04:22	Require police or medical assistance on arrival?
04:10	Coordinates: 40° 07' 41" N, 32° 59' 42" E	04:27	Cleared ILS approach RWY 03R
		04:29	Confirm established on LOC and G/S

Answer Key

Unit 1

2a **1.01** 1 Standard 2 Plain 3 Plain 4 Standard 5 Plain 6 Plain 7 Plain 8 Plain 9 Standard 10 Plain

3b **1.02** 1 b 2 e 3 a 4 c 5 d 6 f

4a 1 after/aft 2 security/safety 3 alternative/alternate 4 strangers/foreigners 5 request/require 6 hardly/hard 7 controlling/monitoring 8 meat/meal

4b **1.03** 1 quiet 2 loose 3 surfaces 4 wheel 5 area 6 feet 7 ridge 8 ice 9 watching 10 hit

4c **1.04** 1 lift**ing** 2 disconnect 3 service**s** 4 clear**ed** 5 turn**ing** 6 clear 7 slow**ly** 8 check**ed** 9 disconnect**ed** 10 reduc**ed**

7a **1.07** 1 f 2 c 3 a 4 h 5 e 6 b 7 d 8 g

7b **1.07** 1 Instruction 2 Request 3 Instruction 4 Instruction 5 Information 6 Information 7 Instruction 8 Information

7c 1 Standard 2 Standard 3 Plain 4 Standard 5 Standard 6 Plain

7d **1.08** a 1, 11 b 6 c 5 d 7, 8, 9 e 3, 4 f 2, 10, 12

10a, b **1.09** Suggested answers

1 Do you mean Flight Level 310 or heading 310? Confirm Flight Level or heading. 2 What is happening in the cabin? 3 What do the lights look like? What colour are the lights? Where are the lights? 4 Confirm 998 hecto Pascal. Do you mean 998 hecto Pascal? 5 Request visibility, what is current visibility? 6 How many passengers have you got on board? 7 Confirm 3,000 feet 8 How much more time do you need? When will you be ready? 9 How much are you delayed? How long are you delayed? 10 What can you see on the taxiway? Describe what you can see.

12a 1 ILS 2 RVR 3 LDA 4 TCAS 5 RVSM 6 AIRPROX 7 IAF 8 EGPWS 9 ETOPS 10 MSA 11 ATIS 12 in.Hg

12b **1.11** 1 IRS 2 ETA 3 EFIS 4 ACC 5 INS 6 ASI 7 IAS 8 OAT 9 AAL 10 ACARS

12e **RWY** Runway; **VOR** VHF Omnidirectional Range; **Crs** course; **Alt** altitude; **MDA** Minimum Descent Altitude; **MDH** Minimum Descent Height; **Apt elev** airport elevation; **Alt Set: IN (hPa)**: altitude setting – inches (hectoPascal); **FL** Flight Level; **R** radial; **DME** Distance Measuring Equipment; **IAS** Indicated AirSpeed; **IAF** Initial Approach Fix; **MAP** Missed Approach Point; **NM** nautical miles; **APCH** approach

13 1 h 2 c 3 g 4 k 5 b 6 j 7 l 8 e 9 a 10 i 11 f 12 d

14a **American spelling** center, color, downdraft, gage, leveled, program, stabilizer, tire

British spelling centre, colour, downdraught, gauge, levelled, programme, stabiliser, tyre

14b **American and British English**

1		6	
handoff	American	hPa	British
handover	British	in.Hg	American
2		7	
traffic pattern	American	ramp	American
traffic circuit	British	apron	British
3		8	
hold	British	visibility: statute miles	American
stack	American	visibility: kilometres	British
4		9	
airplane	American	clear the runway	American
aircraft	British	vacate the runway	British
5		10	
jetway	American	disembark	British
airbridge	British	deplane	American

15a **1.12** 1 the Gulf 2 Britain 3 Russia 4 South East Asia 5 North America 6 South America

16a 1 standard 2 standard 3 standard 4 non-standard 5 plain 6 non-standard 7 standard 8 plain 9 standard 10 plain

16b 1 heavy 2 failure 3 minimum 4 visibility 5 direct 6 IMC 7 turn-off 8 blind

Unit 2

2a 27·33→ outbound destination sign

15-33 runway holding position sign

A taxi location sign

no-entry sign

taxiway ending marking

A→ runway exit sign

ILS ILS critical area sign

runway centreline marking

2c 1 f 2 e 3 g 4 b 5 a 6 h 7 d 8 c

3c 1 e 2 h 3 j 4 a 5 i 6 b 7 f 8 c 9 g 10 d

4 **1.16** 1 T 2 F – 01R–19L 3 F – Taxiway A gives access to 19R 4 F – Control Tower is 1283' above sea level 5 F – Taxiway Delta does not intersect the runway 6 T 7 F – 01L–19R is longer 8 T

5a across–along; aft–forward; ahead–behind; back to–out from; incoming–outgoing; left–right; near–far; on–off; out of–into; outbound–inbound; over–under; to–from

5b 1 on 2 ahead 3 incoming 4 to 5 along 6 back 7 far 8 right 9 over

7c 1 Radio frequency 2 Atmospheric pressure 3 Part Number 4 Heading, course, wind direction, vector 5 Flight number 6 Airspeed 7 Rate of climb/descent 8 Mach number 9 Rate of descent 10 Atmospheric pressure 11 Weight 12 Time

8a **1.19** 1 Austral 283 / 15 2 RWY 25 / Lufthansa 27 3 Avianca 357 / 45 4 second / F 14 5 767/ RWY 17 6 BHQ / 18 / M 7 AA 757 8 25 / Thai 607 9 A320 / 39 10 China Eastern 295 / S15 / L

9a 1 very 2 almost 3 hard 4 a little 5 just 6 severely 7 only 8 soon

12a a Air Traffic Control b Foreign Object Damage c Non-Directional Beacon d Universal Time Coordinated e Actual Time of Departure f Ground Power Unit g Altimeter setting to indicate height above aerodrome / threshold h Very High Frequency i Estimated Time of Departure j Instrument Landing System k Runway Visual Range l VHF Omni-directional Range

12b **1.21** 1 ILS 2 QFE 3 UTC 4 ETD 5 NDB 6 ATD 7 VOR 8 RVR 9 VHF 10 ATC 11 GPU 12 FOD

13a **1.22** 1 **C24:** Thai 236 / New Delhi 2 **C28:** Croatia 792 / Zagreb 3 **C21:** Austrian 517 / Frankfurt 4 **C26:** Air Berlin 209 / Warsaw 5 **C25:** Scandinavian 651 / Bergen 6 **C22:** Ice Air 432 / Luxembourg 7 **C27:** China Southern 569 / Shanghai 8 **C23:** Japan Air 773 / Tokyo

14b **1.23** 1 d 2 f 3 c 4 a 5 e 6 g 7 h 8 b

16 1 cancelled, delayed 2 leaking, seeping, unserviceable 3 bogged down, stuck 4 inoperative, broken down, unserviceable 5 frozen 6 dented, damaged, twisted, scratched, cracked 7 deflated, flat 8 missing, damaged

17a **1.24** 1 f 2 c 3 e 4 g 5 a 6 j 7 b 8 h 9 i 10 d

19a **1.25** 1 safely 2 completed 3 failed 4 stronger 5 missing 6 spilled 7 slightly 8 differences 9 cracked 10 correctly

25a 1 Bravo Charlie Echo 2 Bravo Echo Charlie 3 Charlie Echo

26a Express 3525, e) and a); Citation B77, c) and f); Tannair 79, b) and d)

Unit 3

2a a cargo loading b checking / inspecting c catering d chocking e pushing back / towing f refuelling g guiding / marshalling h embarking / boarding / enplaning

2b 1 g 2 d 3 b 4 f 5 c 6 a 7 h 8 e

4 **1.26** 1 a 2 b 3 g 4 f 5 h 6 e 7 d 8 c

6a **1.27** 1 loading 2 servicing 3 refuelling 4 towing 5 de-icing 6 taxiing 7 docking 8 cleaning

7a **1.28** 1 starting 2 closing 3 approaching/taxiing/moving 4 giving way 5 vacating 6 waiting

8a **1.29** 1 Standing by 2 Holding short of the intersection of Taxiways November and Lima 3 Pushing back to face east 4 Crossing Taxiway Romeo 5 Checking our altimeter setting 6 Contacting 121.95 7 Slowing down 8 Overtaking the Star Alliance B737 9 Holding short of Taxiway Tango 10 Expediting crossing

9 1 d 2 g 3 f 4 h 5 a 6 c 7 b 8 e

11a a de-icing vehicle b fire truck / fire engine c airbridge / jetty / jetway / walkway d GPU / ground cart e tractor / tug / tow vehicle f snow plough / sanding or gritting vehicle g follow-me car h nose-in docking system i baggage cart / trolley / dolly

11b **1.30** 1 c 2 h 3 f 4 a 5 e 6 b 7 d 8 g

14a 1 i 2 d 3 h 4 f 5 c 6 g 7 j 8 a 9 e 10 b

14b **1.32** 1 g 2 e 3 d 4 f 5 h 6 b 7 c 8 a

15a **1.34**

	Location	Aircraft/Vehicle	Anomaly
1	Taxiway E2	United B777	dark smoke, flames in tailpipe Engine 1
2	Intersection taxiways R and N	Fokker 50	skidded, nose gear in snow drift
3	RWY 14, 200m before exit B, RH side	Fedex Airbus	metal debris
4	Runway 21L	Air Berlin 259	hard landing, possible landing gear damage
5	Stand 16	LH A330 / Turkish A310	collision during pushback, A330 damaged wing tip
6	Taxiway G near intersection with Q	USAir 1587	stray dog

18 1 flame 2 maintenance 3 exhaust 4 way 5 shut 6 shutting 7 121.85 8 disembark

19 **1.37** ***Suggested answers***

1 I'll get it replaced by the mechanics / the engineers / maintenance / Engineering. 2 I'll get the IT technician to repair it. 3 I'll get Catering to deliver some more. 4 I'll have the cleaners come back. 5 I'll get the firemen to cool them. 6 I'll get the dispatcher to print out a new one. 7 I'll have a tug sent to your stand. 8 I'll have the police escort him off the plane. 9 I'll have the ramp staff remove it. 10 I'll get an ambulance to meet you at the gate.

20a **1.38** 1 Hijet 451 2 Taxi via outer taxiway to Stand 17 3 flame from right engine during landing 4 Stop 5 Shut down all engines 6 121.85 7 checked and cooled right-hand engine 8 shut down both engines and discharged both fire extinguisher agents 9 stairs 10 Ø

Unit 4

2a **1.40** 1 979 2 429 3 868 4 6393 5 4213 6 5797 7 4031 8 7951 9 6833 10 1255

4 1 d 2 f 3 g 4 a 5 h 6 c 7 e 8 b

5a **flight crew:** a; b; d; e; j; m; p; q **ATC:** c; h; i; k; o **airport infrastructure:** f; g; l; n

5b **1.42** 1 q 2 l 3 k 4 e 5 a 6 n

7a 1 d, g, j, k, m 2 a, j, k, m 3 a, e 4 g, j, k, l, n 5 n 6 l, m

11 1 f 2 e 3 g 4 b 5 d 6 h 7 a 8 c

12a **1.44** 1 We must switch over to the standby power supply. 2 All the flights will be delayed. 3 Flights may be delayed. 4 You should use your glasses. 5 Yes, I can see them. 6 All traffic must use November and Papa. 7 They will be with them in 90 seconds. 8 You should be on time tomorrow.

13a **1.46**

	Location	Aircraft / Vehicle	Type of incident
1	e	Dash 8 / A319	Dash 8 leaving holding point N4; A319 lined up RWY 09 from N5
2	g	car / LH 375	RWY maintenance car parked on 36C between W3 and W4, LH 375 lining up
3	a	A320 / tractor	Air India A320 ready on RWY 09; tractor crossing N2
4	c	Citation / Beechcraft	Executive 44 RWY 22; Beechcraft TWY G2
5	f	Mexicana 388 / ATR 72	Mexicana 388 only just cleared ATR 72 vacating RWY 24 on S1
6	d	KLM 189 / MD90	KLM 189 go around; MD90 vacating RWY 18C
7	b	Falcon 483 / tug, Embraer	Falcon 483 cancelled take-off; tug towing Embraer on G4
8	h	Tunisair 045 / Hercules	Tunisair 045 lining up RWY 24; Hercules entering RWY from S4

15b 1 b 2 c 3 c 4 a 5 b 6 a 7 c 8 b

17a **1.47** 1 e 2 d 3 b 4 a 5 f 6 c 7 g 8 h

20 **1.48**

1 Controllers use surface movement radar to monitor traffic on the ground.
2 Pilots use 121.9 to contact Ground Control.
3 Controllers use call signs to identify individual aircraft.
4 Pilots use all their senses to create situational awareness.
5 Inertial navigation uses laser gyros to calculate aircraft position.
6 Controllers use electronic flight strips to manage separation and flow of traffic.
7 Controllers use binoculars to follow aircraft movements visually.
8 Pilot and controllers use VHF to communicate with each other.

21 **1.49**

1 aircraft landing gear fire / TWY N blocked
2 tyre debris / delays on RWY 26L
3 ice patches intersection TWY R and T / taxi with caution
4 RWY 13R turn-off overshot, Fedex backtracking / delays on RWY 13R
5 ATR stopped on TWY F3 / departures delayed
6 Stop-bar lights inoperative RWY 29R / caution
7 737 on TWY G with open bulk cargo door / 737 return to gate
8 RWY 18R 275 m / CAT IIIA conditions

Review A

1a **1.50**

1 light / right	5 again / against	9 then / than	13 tired / tyre	17 fuel / full
2 chart / cart	6 services / surfaces	10 way / away	14 quite / quiet	18 lose / loose
3 won't / want	7 hand / land	11 near / rear	15 steel / still	19 feel / fill
4 low / load	8 least / last	12 wheel / will	16 fly / flight	20 clear / clean

1c, d **1.52** 1 rear 2 marshaller 3 east 4 will 5 seagulls 6 dog 7 odour 8 stomach 9 assistance 10 oil

2a 1 out of 2 on 3 down 4 in 5 behind 6 at 7 back 8 to 9 ahead 10 onto

2b 1 heard 2 see 3 felt 4 looks 5 smell 6 appears 7 don't think 8 noticed

2c 1 a 2 b 3 c 4 a 5 c 6 a 7 b 8 b 9 c 10 a

3a **1.53** 1 tow-bar 2 visual docking guidance system 3 conveyor belt loader 4 stop bar 5 jetway 6 crew minibus 7 chocks 8 follow-me car 9 GPU 10 fire engine

3b 1 missing 2 congested 3 leaking 4 delayed 5 bogged down 6 dented 7 overflowing 8 deflated

3c **1.54** 1 ground handler 2 passenger service agent 3 paramedic 4 dispatcher 5 aircraft engineer 6 tug driver 7 police 8 flight attendant

5a **1.56** 1 MD11 2 run-up area east of RWY 19L 3 Alpha, Bravo, Echo, Foxtrot 1 4 B767 5 01L 6 yes 7 2,500 ft from Taxiway Foxtrot 8 In excess of 70 kts 9 800 ft 10 Juliet

5b **1.57** 1 B747-400 cargo 2 Tokyo 3 21:25 4 14L 5 Chicago O'Hare 6 taxi Bravo and Mike, hold short Runway 09 Right / 27 Left 7 break in transmission; readback errors, hearback error 8 B737 9 14 Right 10 1,500 ft

Unit 5

2a a fog b bird strike c lightning strike d ice build-up e wake turbulence f cumulonimbus g volcanic ash h crosswind i rain j standing water

3a **2.01** 1 gusts 2 low ceiling 3 windshear 4 drifting snow 5 glare 6 hail 7 smoke 8 drizzle

3b **2.02** 1 thick smoke 2 scattered cloud 3 heavy rain 4 severe turbulence 5 deep standing water 6 bright glare 7 poor visibility 8 strong wind 9 scattered showers 10 thick fog

5a

1 RA	rain	7 GR	hail	13 SCT	scattered
2 DU	dust	8 SQ	squall	14 BCFG	fog patches
3 DZ	drizzle	9 IC	ice	15 DRSN	drifting snow
4 SN	snow	10 VA	volcanic ash	16 FZRA	freezing rain
5 HZ	haze	11 TS	thunderstorm	17 RASH	rain showers
6 BR	mist	12 FU	smoke	18 MIBR	shallow mist

5b **2.03**

1 METAR KBUF (Buffalo Niagara International) 12**1755**Z AUTO **210**16G24KT **180**V240 1SM R**11**/P**6000**ft – **RA** BR BKN**015** OVC025 **06**/04 A**2990**

2 METAR EPKK (Krakow) 06**1800Z** 120**6KT** 1400 R**12**/P**1500**N +SN **BKN**017 M04/**M07** Q**1020** NOSIG

3 TAF SBRF (**Recife**)070801Z 210**12**KT 9999 BKN**010** – RA BKN008 TEMPO 0712/0718 **SCT**015=

7a **2.05**

1

Airport	NZCH Christ-church	Visibility	5,000 m
Information	G	Cloud	SCT 3,000 ft BKN 11,000 ft
Time	2200Z	Temperature	12°
Departure RWY	20	Dew point	10°
Wind velocity	110° / 20 kts	QNH	1001 hPa

2

Airport	Prague	Visibility	10 km or more
Information	L	Precipitation	light rain showers
Time	10:59	Ceiling	Few 500 ft; few CB 1,500 ft; BKN 4,000 ft
ILS RWY	24	Temperature	15°
RWY condition	wet	Dew point	14°
Transition level	50	QNH	1019 hPa
Runways closed	13/31	Special instructions	NOSIG
Wind velocity	340°/ 14 kts		

13a **2.06** 1 e 1:39 2 g 1:40 3 a 1:41 4 h 1:42 5 c 1:43 6 f 1:44 7 b 1:45 8 d 1:46

17a **2.08** 1 B747-400 2 Singapore 3 Sydney 4 030°, 17 kts 5 18 nm SW of airport 6 different frequency 7 3 nm from runway 8 16R 9 180°, 22 kts 10 20 kts tailwind 11 continuous wind data call-outs 12 15 kts headwind 13 right crosswind 14 131 kts 15 820 ft/min 16 go around

18a **2.09** 1 b 2 b 3 b 4 a 5 b 6 a 7 b 8 a

21a **2.11** 1 F – 20:32 2 T 3 T 4 F – 1,500 fpm 5 F – only the route instructions 6 T 7 T 8 T

24a 1 d 2 a 3 b 4 f 5 c 6 e

25 1 f 2 h 3 a 4 g 5 c 6 b 7 d 8 e

Unit 6

2a **2.13** 1 b 2 c 3 a

2c Scenario a

3a **2.14** 1 e – Air France 3762 2 c – Emirates 5371 3 d – Japan Air (JAL) 1956 4 f – Air China 3776 5 a – Delta 1982 6 b – Air Canada 5718

4a 1 assigned 2 were assigned 3 received 4 rotating 5 taking 6 occurred 7 following 8 using 9 was issued 10 to contact

4b 1 through/to 2 at 3 from 4 back 5 away 6 on 7 over 8 right

6a 1 d 2 g 3 b 4 a 5 c 6 e 7 f

7a **2.15** 1 F – in November (northern hemisphere) 2 F – LAM 3 T 4 T 5 F – the crew read back the instruction, but descended through FL 150 and did not report on reaching 6 T 7 F – 14,052 ft 8 T

8a **2.16** 1 hearback error 2 readback/hearback error

9a **2.18** 1 e 2 b 3 f 4 a 5 d 6 c

9b **2.18**

Incident 1
a 3,000 ft b ILS 29 c 2,000 ft d 600 ft

Incident 2
a FL 350 b Flight 578

Incident 3
a descend b stop descent at FL 300 c FL 298

Incident 4
a Brussels b heavy rain c 230 ft

Incident 5
a 6,000 ft b FL 120 c TCAS Descend d QNH

Incident 6
a FL 140 b FL 078 c FL 080

12a **2.20** 1 eight miles ahead 2 heading 3 After 4 under your own responsibility 5 11 o'clock

12c **2.20** 1 where 2 what 3 when 4 how 5 where

13b **2.21** 1 b 2 a 3 g 4 e 5 c 6 d 7 f

14 **Student A**
1 where 2 when 3 how 4 where 5 what/where 6 when 7 what 8 what/where 9 where 10 where 11 what 12 when 13 when/where 14 how 15 when

Student B
1 when 2 where 3 how 4 when 5 where 6 what 7 where 8 what 9 where 10 when 11 what 12 when 13 how 14 what/where 15 where

15a 1 c 2 b 3 b 4 a 5 b 6 c 7 a

16 **2.22** 1 b 2 c 3 a 4 b 5 b 6 c 7 a 8 b

18a **2.23** 1 e 2 c 3 b 4 a 5 d 6 f

19a **2.24** 1 weight 2 route 3 know 4 break 5 due 6 crews 7 too 8 hear 9 to 10 allowed

20a 1 d 2 g 3 h 4 a 5 f 6 c 7 e 8 b

21a 1 P 2 P 3 C 4 C 5 P 6 C 7 C 8 P 9 C 10 C

Unit 7

3a **2.25** a, c, e, f

3b 1 left 2 birds 3 towards 4 Tower 5 thrust 6 both 7 unable 8 traffic 9 available 10 Anything

3c 1 heading 270 / heading 220 2 They say three different call signs: 1549; 1539 and 1529. 3 return to LaGuardia 4 LaGuardia Tower 5 surprise, disbelief 6 RWY 13 7 RWY 04 8 landing at Teterboro 9 RWY 01 at Teterboro 10 land in the Hudson River

4a **2.26** 1 f 2 d 3 h 4 a 5 c 6 b 7 e 8 g

6a 1 h 2 e 3 g 4 c 5 f 6 j 7 a 8 b 9 d 10 i

7a **2.27** 1 e 2 g 3 a 4 c 5 f 6 d 7 h 8 b

11b 1 c 2 h 3 f 4 g 5 a 6 d 7 b 8 e

11c **2.30** 1 eastbound 2 established 3 alternate 4 diagnosis 5 assume 6 alternatives 7 indication 8 consult

12a **2.31** 1 night 2 350 3 90 degrees West 4 drop in oil quantity on Engine 2 5 Dispatch 6 150 minutes 7 120 minutes 8 poor weather

12c **2.32** 1 F – decides to continue and informs Dispatch 2 T 3 F – 15 minutes 4 T 5 F – he throttles back Engine 2 6 T 7 T 8 T

14a **2.33** 1 e 2 g 3 c 4 h 5 d 6 f 7 a 8 b

17a 1 HDG 2 UTC 3 RTF 4 IMC 5 IAS 6 VHF 7 VMC 8 ETOPS 9 DME 10 VSI 11 ADF 12 VOR

Review B

1a **2.36** 1 asked 2 had 3 reporting 4 suffered 5 remaining 6 climbing 7 cleared 8 passed 9 passes 10 climbed

1d **2.38** 1 here 2 missed 3 whole 4 its 5 whether 6 mail 7 sea 8 where 9 ate 10 to

2a 1 g 2 d 3 h 4 f 5 b 6 c 7 e 8 a

2b 1 because of 2 because 3 force 4 resulted in 5 so 6 has made 7 due 8 caused

2c 1 b 2 a 3 b 4 c 5 c 6 a 7 c 8 a

3a 1 thicker 2 veering 3 increasing 4 gusting 5 heavier 6 lift 7 weakening 8 scattered

3b 1 orbiting 2 turning back 3 turning 4 contacting 5 climbing 6 donning 7 making 8 monitoring

5a **2.41**

Airport	Stockholm, Arlanda	Visibility	5 km	Dew point	08°
Information	E	Cloud	500 few 1,200 SCT	QNH	1009
Time	13.55Z	Ceiling	3,000	ILS RWY	19L
Wind velocity	210°, 8 kts	Temperature	15°	Departures RWY	19R

5b **2.42** 1 F – they are already level at FL 190 2 T 3 F – due to a TCAS TA 4 F – he suffers from expectation bias and interprets the communication as a request 5 F – Shannon 6 T 7 T

Unit 8

2b **3.01** 1 A321 2 Spain 3 Norway 4 216 5 7 6 800 ft 7 1,200 m 8 RWY 18 9 2,569 m 10 45 m

3a **3.02**

Crew actions

1 3 minutes before touchdown 2 1 dot high 3 780 m from threshold (350 m beyond touchdown zone) 4 140 kts 5 apply maximum reverse thrust 6 half-way down the runway 7 engaged parking brake 8 increased deceleration 9 end of hard runway surface 10 minor damage to lower skin and nose wheel rim and tyre

Environmental conditions

1 dry 2 good 3 2,500 m 4 500 feet 5 060 6 6 kts 7 contaminated with 8mm of wet snow 8 medium 9 12 mm 10 poor

4a 1 f 2 h 3 a 4 g 5 b 6 d 7 c 8 e

9a **3.05** 1 g 2 b 3 h 4 a 5 e 6 c 7 d 8 f

9c 1 if 2 must 3 must 4 probably 5 must 6 if 7 must 8 probably

12a 1 scheduled 2 descent 3 course (path) 4 deviate 5 due to 6 edge 7 distracted 8 noticed 9 initiated 10 vectors

12b **3.06** 1 F – Runway 28 2 T 3 F – at 5 nm 4 F – confused the lights of a hotel with runway approach lighting 5 T 6 F – distracted by communications with airport maintenance personnel 7 F – at an altitude of 580 feet 8 T

16a 1 P 2 C 3 P 4 A 5 C 6 P 7 A 8 C 9 P 10 P 11 C 12 C 13 A 14 P 15 C 16 P

19 1 to the southwest 2 to the south 3 from 4 above 5 long 6 outbound 7 between 8 to the north

22a **3.08** 1 T 2 F – Lufthansa 338 is on short final; another aircraft has not vacated 3 T 4 T 5 T 6 F – 2,710 metres 7 T 8 T 9 T 10 F – an excessive sink rate

23b **3.09** 1 f 2 d 3 e 4 g 5 a 6 c 7 b 8 h

24 1 slippery 2 missed 3 busy 4 threshold 5 rate of descent 6 past 7 collided 8 passed

Unit 9

2a 1 b 2 c, k 3 a, f 4 d, j, m 5 h, i, l 6 e, g

3a 1 jammed, locked 2 disconnected 3 cracked, missing 4 empty 5 garbled 6 high, dangerous 7 broken, unserviceable 8 leaking

3b 1 cracked 2 missing 3 loose 4 loss 5 contaminated 6 stall

5a **3.11** 1 g 2 d 3 a 4 f 5 b 6 e 7 c 8 h

7a **3.13** 1 c 2 h 3 a 4 d 5 g 6 e 7 f 8 b

9d 1 g 2 f 3 b 4 e 5 h 6 a 7 d 8 c

10b **3.16** 1 fuel problems 2 gear problems 3 bird strike 4 depressurisation 5 unlawful interference 6 hydraulic problems 7 smoke or fire in the cockpit 8 bomb warning

12 1 print out 2 look after 3 running out of 4 looking for 5 lifted off 6 put out 7 read back 8 make up 9 pull up 10 running away 11 pass on 12 ran up

13 **3.17**

Circumstances of the flight		Consequences	
1 Route:	London to Bangkok	1 Event at 08:40	bus-control-unit-status message
2 Passengers: Crew:	346 19	2 AC buses not powered:	1, 2 and 3
3 Altitude at 08:37 UTC	21,000 ft	3 System disconnected:	autothrottle
4 Flight phase:	descent	4 System disengaged:	autopilot
5 Incident in forward galley:	water leak	5 Display lost:	right-hand displays
6 Incident reported by:	customer service manager	6 Status of AC bus 4:	normal
7 Nature of the water:	smelly	7 State of circuit breakers:	all closed
8 Cabin crew action:	soak up water with blankets	8 Strength of radio transmissions:	less than normal
9 State of cabin lights:	extinguished	9 EPR indication available:	only on Engine #4
10 Time, RWY and type of landing:	09:07, RWY 01R, VMC	10 State of cabin lights:	extinguished

16a 1 e 2 h 3 a 4 f 5 c 6 d 7 b 8 g

17 1 but 2 until 3 then 4 if 5 by 6 to 7 so 8 and 9 unless 10 for

19a **3.19** 1 full 2 lift 3 dumper 4 lose 5 far 6 last 7 loss 8 way 9 warm 10 clean

23a **3.21** 1 T 2 F – 165 3 T 4 T 5 F – first the localizer, then the glide path 6 T 7 T 8 F – at an altitude of 400 feet

24a **3.22** 1 b 2 c 3 a 4 c 5 a 6 c 7 c 8 a

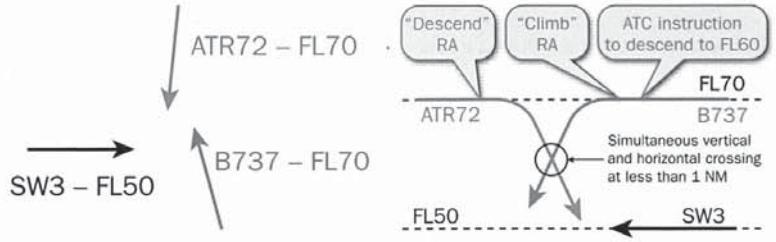
Unit 10

2a **3.23** 1 climb immediately to 5,000 feet 2 Descend RA 3 after 4 disregarded ATC and descended 5 climbed, made 90° turn 6 increased horizontal separation 7 0.9 nautical miles, 560 feet 8 less than 300 feet

3a 1 e 2 f 3 c 4 d 5 a 6 b

4 1 touch down 2 turn back 3 take over 4 turn up 5 shut down 6 take off 7 shut off 8 Switch over 9 start up 10 turn off 11 speak up 12 switch off

8a **3.27**



8b **3.27** 1 ATR72 2 IMC 3 60 4 Climb 5 descend 6 Increase Descent 7 SW3 8 TCAS

12a 1 C 2 B 3 A

12c **3.29** 1 b 2 d 3 a 4 e 5 c 6 f

17a **3.31** 1 098° 2 109° 3 3,800 ft 4 8 DME 5 265° 6 MDA (Minimum Descent Altitude) 7 4.5 DME 8 3,900 ft

19a 1 d 2 c 3 d 4 c 5 b 6 a 7 b 8 d

20b 1 g 2 a 3 e 4 d 5 f 6 b 7 c

21b 1 announcing, say 2 sounded, worry 3 expect 4 seem, published 5 look

22a **3.32** 1 h 2 f 3 b 4 e 5 a 6 c 7 g 8 d

26b **3.33** report, confirm, traffic, runway, established, localizer, restarted, engine, airspeed, altitude

Review C

1a **3.35** 1 immediately 2 armed man 3 left 4 unable 5 decreased; 300 feet 6 seems; vehicle 7 nose gear; extended 8 windshear 9 Go around; go around; Right 10 severely concussed; divert

1c **3.36** 1 walking 2 against 3 watch 4 we'll 5 wet 6 had 7 clearing 8 quiet 9 old 10 height 11 thanks 12 past

2a **3.38** **Suggested answers**
1 Which runway is in use? 2 Why are you returning to land? 3 How many passengers do you have / have you got on board? 4 When do you expect to be crossing Bratislava? 5 How much fuel do you have in reserve? 6 What is your problem? 7 Who told you to expect delays? / How long a delay were you told to expect? 8 Why do we need to take delaying action? 9 How much should we reduce our speed (by)? 10 Which level should we expect? 11 Which runway is closed? 12 What / When is our new ETA? 13 Who will meet our sick passenger? 14 How much more time do you need? / How long do you need? 15 Which automation have you lost?

2b 1 e 2 g 3 h 4 a 5 d 6 c 7 b 8 f

2c 1 b 2 a 3 b 4 a 5 c 6 c 7 b 8 c

3a 1 descent 2 vectors 3 veering 4 beam 5 glare 6 slippery 7 stabilised 8 confusing

3b **3.39** 1 cracked windshield 2 radar clutter 3 frequency congestion 4 above maximum landing weight 5 faulty high intensity runway lighting 6 stuck microphone 7 jammed trailing edge flaps 8 engine flame-out

3c 1 at 2 in 3 from 4 between 5 for 6 on 7 long 8 inbound

3d 1 confused 2 distracted 3 expected 4 experienced 5 reported 6 decided 7 called out 8 managed

5 **3.41** 1 T 2 F 3 F 4 T 5 T 6 F 7 F 8 T 9 F 10 T

Audioscript

Unit 1

2a, b, c **1.01**

1 Request taxi for departure to Montreal.
2 What is the condition of your injured passenger?
3 What can you see on the runway?
4 Report level.
5 Report the extent of your damage.
6 If you're going around, climb straight ahead to 2,500 feet and contact the Tower on 119.75.
7 What is the situation in the cabin now with the hijackers?
8 How much assistance will you require on landing?
9 Request ILS approach Runway 28 Right.
10 Say how much your manoeuvrability is affected.

3b, c **1.02**

1 **ATCO:** Delta 357, descend to altitude 9,000 feet, QNH 1017.
Pilot: Descend to altitude 5,000 feet, Delta 357.
2 **Pilot:** Varig 289, Tower, reporting a large *[flock of birds]* near the threshold of Runway 23 Right.
3 **Pilot:** Regional 288, our previous arrival is 19:57.
4 **ATCO:** Northwest 1763, taxi into position and hold, Runway 8.
5 **Pilot:** KLM 4805, we are now at take-off.
6 **Pilot:** I think we have a problem with our well, Malev 602.

4b **1.03**

1 We must depart by 23:00 or we will be into quite *(quiet)* hours.
2 The First Officer found a lose *(loose)* engine cowling during the walk-around inspection.
3 The flight control services *(surfaces)* require de-icing before we depart.
4 We have a well *(wheel)* that needs changing on the right main gear.
5 There is quite a lot of traffic in the terminal array *(area)*.
6 Visibility 2,500 metres, light rain showers, overcast 1,300 feed *(feet)*, temperature 11, dew point 11.
7 There is a rich *(ridge)* of hills rising to 1,850 metres to the east of the field.
8 The purser has asked for some more eyes *(ice)* and soft drinks.
9 I am washing *(watching)* the incoming traffic on my screen.
10 An intoxicated passenger has heat *(hit)* one of the cabin attendants.

4c, d **1.04**

1 The fog seems to be lifting and departures should be able to resume in 20 minutes.
2 Use the instinctive disconnect push button on the yoke.
3 The catering services have finished loading the trolleys.
4 Cleared for immediate take-off.
5 We are turning left onto heading 130 degrees.
6 Push that key to clear the screen.
7 The weather is improving slowly.
8 We've checked the new data we entered.
9 The autopilot and autothrust have disconnected.
10 We've reduced our speed to 160 knots.

5a **1.05**

1 Descend to Flight Level 130.
2 Give way to the 767 from right to left.
3 Dragonair 475 squawk 6722.
4 Expedite climb until passing Level 170.
5 Runway 28 cleared to land.
6 Orbit right from present position.
7 Reduce to minimum approach speed.
8 Taxi to holding point Runway 17.

6 **1.06**

1 **ATCO:** Aeroflot 238, cleared to land Runway 26 Right, wind 220 degrees, six knots.
2 **ATCO:** Gulfair 4752, turn left heading 290, intercept ILS 26 Left.
Pilot: Turn left heading 250, intercept ILS 26 Left, Gulfair 4752.
3 **ATCO:** Silkair 3925, Runway 21 Right, QNH 987 hectoPascal.
4 **ATCO:** Air Madagascar 376, descend to Flight Level 160, cross Habsheim above Flight Level 180.
Pilot: Descend to Level 160, cross Habsheim below Level 180, Air Madagascar 376.
5 **ATCO:** China Eastern 469, Contact Ground 124.365.
Pilot: Contacting Ground 123.465, China Eastern 469.
6 **ATCO:** Taca 559, cross Runway 17 Left, report vacating.
7 **ATCO:** Air France 3784, line up Runway 08 Left, intersection Delta 1, behind a Boeing 737 intersection Delta 2.
8 **ATCO:** Turk Air 575, join downwind Runway 21 Right, wind 190 degrees, six knots, QNH 1017.

7a, b **1.07**

1 **ATCO:** Egyptair 581, go around immediately. Vehicle on runway.
2 **Pilot:** Air Sofia 442, request emergency services standing by.
3 **ATCO:** Vietnam Airlines 365, hold short of Runway 19 Left.
4 **ATCO:** Slovakia 083, give way to the 747 to your right.
5 **ATCO:** Shenzhen Air 638, cleared to land Runway 29 Right.
6 **ATCO:** Speedbird 5631, you are advised that current RVR is 400 metres.
7 **ATCO:** Lan 284, climb to Flight Level 260.
8 **Pilot:** We have to wait for another aircraft to vacate our stand.

7d **1.08**

1 Commence descent now to maintain a three degree glide path.
2 Are you ready for immediate departure?
3 Please have an ambulance standing by.
4 A320 requesting tow from Taxiway Mike to apron.
5 Which engine has failed?
6 Giving way to Qantas A380.
7 A departing B777 reported windshear at 600 feet.
8 There seems to be some metal debris 400 metres from the threshold of Runway 19.
9 Runway vacated.
10 Do you have visual contact on preceding traffic?
11 Backtrack Runway 25 Left, line up and wait.
12 Why are you stopped?

10a, b **1.09**

1 We're on 310.
2 There's some trouble in the cabin.
3 We can see some lights.
4 The altimeter shows 998.
5 The visibility has deteriorated.
6 We've got a full cabin today.
7 Climb to three thousand.
8 We need some more time.
9 We are a bit delayed.
10 There's something ahead of us on the taxiway.

11b **1.10**

1 On approach, after an in-flight turnback, you are just over your maximum landing weight.
2 The cabin crew have reported smoke in one of the aft toilets.
3 You have 25 minutes' fuel endurance and are in a holding pattern.
4 There has been a heavy snow storm and snow ploughs are currently clearing the runway in use.
5 An Icelandic volcano is in eruption and North Atlantic routes over 60 degrees North have been closed to traffic.
6 A Fokker 50 is blocking Taxiway Delta 3.
7 Heavy rain and standing water have reduced braking action to poor.
8 You are not sure if your nose gear is down and locked.
9 An A380 is taking off from Runway 28 Right ahead of an MD-90.
10 You are not sure of your position and gate number after landing.

12b, d **1.11**

1	IRS	6	ASI
2	ETA	7	IAS
3	EFIS	8	OAT
4	ACC	9	AAL
5	INS	10	ACARS

15a **1.12**

There seems to be an airport van parked on the side of the taxiway about 400 metres ahead. It looks like they are working on the lighting. Can you instruct them to clear the taxiway, please?

17a **1.13** **ATCOs**

1 Request Taxiway Echo.
2 Advise the type of traffic ahead of us.
3 Request Flight Level 70 over Richmond VOR.
4 Request direct Baranquilla.
5 Request an earlier slot.
6 We'd like to divert to Calgary.
7 Request higher.
8 Ready to push from Stand 38.
9 Have you got an earlier slot?
10 We'll be requesting start-up in about ten minutes.

17b **1.14** **Pilots**

1 Adjust speed to cross Bologna at 28.
2 Vacate runway by first high-speed turn-off.
3 Expedite departure.
4 Climb and maintain Flight Level 370.
5 Reduce speed by 30 knots for spacing.
6 Are you able to increase your rate of descent?
7 Behind the landing 737, line up.
8 Expect ILS approach Runway 13 Right.
9 Report traffic in sight.
10 Continue descent to 2,000 feet.

Unit 2

2c **1.15**

1 Negative. Taxiway closed.
2 Hold short of the runway.
3 Take first right.
4 You should be moving along taxiway Alpha.
5 You can use the same taxiway to reach both runways.
6 Line up and wait.
7 Hold position. We are operating under CAT III conditions.
8 You have reached the end of the taxiway.

4 **1.16**

1 The longest runway is 01 Left – 19 Right.
2 Runway 09 – 27 intersects Runway 01 Left – 19 Right.
3 You can enter Runway 19 Left from Taxiway Alpha 2.
4 The Control Tower is 1,233 feet high.
5 The intersection of Runway 01 Right – 19 Left and Taxiways Delta and Charlie is a hot spot.
6 Four gates cannot be seen from the Control Tower.
7 Runways 01–19 Left and Right are the same length.
8 If you land on Runway 27, you can exit via Taxiway Charlie 8.

6 **1.17**

1 **ATCO:** Taxi to holding position Bravo 2. Hold short Runway 28.
2 **Pilot:** Thai Boeing 747, request tow from Stand Bravo 38 to Maintenance Centre.
3 **ATCO:** Reset Squawk Ident 3417.
4 **ATCO:** Expedite crossing Runway 25, traffic three miles final.
5 **ATCO:** Taxi to holding position Delta 3 via Alpha and Charlie. Hold short of Runway 32.
6 **Pilot:** We are unable to push back at this time. One of our passengers is a no-show and we have to unload his baggage. We will call back as soon as we are ready.
7 **ATCO:** There is a Boeing 787 blocking Taxiway November. Departures are delayed. Expect start-up approval at 35.
8 **ATCO:** Cross Runway 21. Report vacated.
9 **ATCO:** Austrian 371, Runway 14 Right, cleared for take-off.
10 **ATCO:** After departure, climb on runway heading to 1,500 feet, turn right heading 240.
11 **Pilot:** Reporting ice patches and drifting snow on Taxiway Lima, Cathay 725.
12 **ATCO:** Aeroflot 593, taxi slower. Ice patches and drifting snow reported on Taxiway Lima.

7a **1.18**

1 124 decimal 325 MegaHertz
2 1009 hectoPascal
3 Part Number 46729178E
4 245 degrees
5 Condor 1438
6 312 knots
7 1,200 feet per minute
8 Mach 0.79
9 three degree slope
10 29 decimal 98 inches of Mercury
11 109 tonnes
12 ETD 17:58

8a, b **1.19**

1 Austral 283, expect departure at 15. Start-up at your discretion.
2 Runway 25 Left vacated, Lufthansa 27.
3 Avianca 357, slot time 45.
4 Taxi straight ahead, then second right on Taxiway Juliet to Gate Foxtrot 14.
5 There is a 767 bogged down off near the holding point of Runway 17.
6 Bravo-Hotel-Quebec, Stand 18 via Taxiway Mike.
7 Caution, fuel spillage near American 757.
8 Request start up at 25, Thai 607.
9 There is an A320 on our stand, Gate 39.
10 China Eastern 295, taxi to Sierra 15 via Taxiway Lima.

9b **1.20**

1 Taxi with caution // as the airport is very congested.
2 Boarding is almost completed. // We should be ready to push back in five minutes.
3 The ground crews are working very hard // to make sure we get away on time.
4 Some of the passengers were late arriving at the gate; // we'll need a little more time.
5 We have just closed the doors and are ready to depart.
6 When the servicing truck reversed into the right-hand engine, // it severely damaged the cowling.
7 There is only one container // waiting to be loaded.
8 Can you vacate your stand // as soon as possible?

12b **1.21**

1	ILS	2	QFE	3	UTC	4	ETD
5	NDB	6	ATD	7	VOR	8	RVR
9	VHF	10	ATC	11	GPU		
12	FOD						

13a, b, c **1.22**

1 Thai 236, Gate 24, request start-up for New Delhi.
2 Croatia 792, Gate 28, request start-up. We're bound for Zagreb.
3 Austrian 517, Gate 21, request start-up for Frankfurt.
4 Ground, Air Berlin 209, Gate 26, request engine start for Warsaw.
5 Scandinavian 651, Gate 25, request start-up for Bergen.
6 Ice Air 432, Gate 22, request start-up. Our destination is Luxembourg.
7 China Southern 569, Gate 27, request start-up for Shanghai.
8 Japan Air 773, Gate 23, request start-up for Tokyo.

14b **1.23**

1 The departure has been delayed while the aircraft is being de-iced.
2 The incoming aircraft had a tyre blow-out during a rather hard landing with maximum braking and the engineers are changing it now.
3 We are waiting for a disabled passenger to be brought by minibus; we'll be ready for pushback as soon as she arrives.
4 Weather conditions are good this evening and all flights have been leaving on schedule.
5 The tug has arrived at last and the tow-bar is being connected now.
6 Traffic is very light this morning and weather conditions are good. There are two controllers on duty in the Tower.
7 Taxi with caution at the intersection of Golf and Kilo; firemen are carrying out exercises in the vicinity.
8 There are just two more ULDs to be loaded in the forward hold. As soon as the cargo doors are closed, we'll be able to get under way.

17a, b **1.24**

1 We cannot push back yet due to an obstacle on the inner taxiway. There seems to be a green servicing truck parked in the way. We need to push back straight away.

2 Turk Air 288, Gate 37, request a new slot. Maintenance discovered a worn tyre. Expect to be ready for pushback soon.
3 Argentina 356, Stand 17, unable to make our 55 slot. Baggage handling made a mistake and delivered the wrong containers. We're still waiting for them to unload them. We'll be considerably delayed.
4 The tug has broken down. It shouldn't take too long. We'll call you back when ready.
5 Gulfair 758 at Stand Bravo 19. We have 12 pax missing; they were sent to Delta 19. Hoping to board them quickly and push back in time for our 25 slot.
6 Our APU is inop. Request GPU. Can you bring one expeditiously?
7 Our wing tip is slightly dented and the right-hand navigation light cover broken. The roof of the catering vehicle has a large tear.
We have contacted Engineering and requested a technician and will probably require a change of aircraft. We'll keep you fully advised.
8 The AGNIS docking system was unserviceable and we stopped and shut down engines before the line. We are incorrectly positioned for the airbridge.
9 There is currently a large spillage. The fuel tanker is still in position under the right-hand wing. They lost about 300 litres of fuel. I estimate our delay at approximately 30 minutes.
10 Taxiway November is now closed due to a 757 bogged down on the grass. Taxi with caution.

19a, b **1.25**

1 safely	6 spilled
2 completed	7 slightly
3 failed	8 differences
4 stronger	9 cracked
5 missing	10 correctly

Unit 3

4 **1.26**

1 The rear hold door is closed. There are just a few containers to be loaded into the forward hold.
2 I'll ask the First Officer to call you back; he's just doing the external walk-around check at the moment.
3 The nose-in parking seems to be U/S at Gate 37; we'll need a marshaller to guide us into the stand.
4 We'll need to uplift 107 tonnes for the next leg to Sydney.
5 The passengers are boarding now and we should be ready to get underway in about ten minutes.
6 Brakes released. Push back to face east, please.
7 Has the ground told you that the chocks are in place yet?
8 We're unable to push back and start up for the moment; catering is delivering some vegetarian meal trays which were missing.

6a **1.27**

1 We had two pallets of perishable goods arrive at the last minute, but cargo loading is almost complete.
2 The engineer has finished oil servicing.
3 I have requested a tanker for refuelling.
4 The hydraulic power to our nose gear has failed; we will require towing.
5 We will need to allow an extra 20 minutes in the de-icing queue.
6 Request taxi instructions to Runway 13 Right.
7 There are Advanced Visual Docking Guidance Systems at all gates.
8 The company has not arrived to start cabin cleaning.

7a **1.28**

1 **ATCO**: Start-up approved.
Pilot: Starting Number 2.
2 **ATCO**: Advise when ready.
Pilot: We are closing the doors now.
3 **ATCO**: Report position.
Pilot: We are on Taxiway November approaching the intersection with Lima.
4 **ATCO**: Give way to traffic coming from your left.
Pilot: Giving way to traffic.
5 **ATCO**: Expedite crossing Runway 28 Left.
Pilot: Vacating Runway 28 Left.
6 **ATCO**: Have you reached the gate?
Pilot: Negative. We are waiting for a Boeing triple seven to leave our stand.

8a **1.29**

1 Stand by for further instructions.
2 Hold short of the intersection of Taxiways November and Lima.
3 Push back to face east.
4 Cross Taxiway Romeo.
5 Check your altimeter setting.
6 Contact frequency 121 decimal 95.
7 Caution: slow down. Traffic from left to right.
8 Overtake the Star Alliance Boeing 737.
9 Hold short of Taxiway Tango.
10 Expedite crossing.

11b **1.30**

1 All Nippon 651, we require two jetways to disembark our passengers in time.
2 Speedbird 5287, Stand Delta 19, we are a Boeing 767. The nose-in parking system is set for a B737 dash 200.
3 Northwest 1625, how long will we have to wait for snow clearing to be completed?
4 Lufthansa 3627, due to the delay in departures, we will require further wing and stabiliser de-icing. Request advise us of revised departure time.
5 DHL 549, Engineering has decided we need an engine run-up. We are requesting a high-speed tug to take us to the run-up area.
6 Korean Air 838, there has been a spillage of some of our flammable cargo. Request fire service immediately as a precautionary measure.
7 Air France 451, Stand Mike 04. Our APU is unserviceable. Would you please send a GPU?
8 I think we have missed the turn to Charlie. Can you send us a follow-me car?

13 **1.31**

1 Aeromexico 562, follow the Boeing 787 from the left, taxi to holding point Echo 2 Runway 17.
2 Volga Dnepr 875, taxi to holding point India 1 via Taxiway Delta. QNH 998 hectoPascal.
3 Virgin 297, contact Ground 119 decimal 45.
4 Merair 842, hold position. Cancel take-off. I say again, cancel take-off. Traffic on short final.
5 Qatari 2547, taxi to the end, report vacated.
6 Lan 815, caution: construction work to the west of Stand Charlie 35.
7 Eagle Flight 1794, caution: large flock of birds reported east of Runway 02.
8 City 361, line up and wait; vehicle crossing upwind end of runway.
9 Easy 469, cross Runway 34 Left, taxi to holding point Bravo 1, hold short of Runway 34 Right.
10 Singapore 4352, taxi to holding point Juliet 2 Runway 21 via Taxiway Foxtrot, QNH 1003 hectoPascal.

14b **1.32**

1 Cargolux 482, stop pushback immediately. Traffic is passing behind you.
2 Be advised that we can see a large flock of seagulls near the threshold of Runway 06 Right.
3 Tower, Speedbird 5391, it looks like the Delta 767 at Stand 39 has some impact damage under its right forward passenger door.
4 I can see a car crossing the active runway.
5 Tower, Philippine 458, we have just heard a loud thud and felt a slight vibration. Can you see if anything has impacted us?
6 As we were taxiing past Gate 24, we noticed what looked like an oil spill under the right hand engine of the Airbus parked there.
7 Regional 319, Tower. Is your rear cargo compartment closed and locked? From here, it seems that the locking lever is not flush.
8 Tower, Jet Blue 1638, we are on Kilo heading for Runway 10 Left. There appears to be a suspicious-looking man on foot, carrying a large bag, on Mike.

14d **1.33**

1 ... severe vibrations
2 ... smoke coming from the landing gear
3 ... there is a cowl panel missing
4 ... a whistling sound
5 ... the smell of old socks
6 ... gear not fully extended
7 ... a strong crosswind
8 ... the brakes are not responding properly
9 ... several loud thuds and a bang
10 ... a cloud of black 'smoke

15a **1.34**

1 Thai 639, just vacated Runway 13 Right on high-speed turn-off 2. Now on Echo 2. The United triple seven ahead of us appears to have a fire on Engine 1. There is dark smoke and some flames in the tailpipe.
2 Iberia 5849, at the intersection of taxiways Romeo and November. We can see a Fokker 50 on Taxiway November which has skidded and has its nose gear in a snow drift.
3 Air India 3094, vacating Runway 14. We landed after a Fedex Airbus freighter. We noticed some metal debris on the right-hand side of the runway 200 metres before exit Bravo.
4 Air Berlin 259, we made a hard landing on Runway 21 Left due to very gusty conditions. We suspect that we may have some tyre or gear damage.
5 Dragonair 462, Inner Taxiway Juliet. A Lufthansa A330 pushing back from Stand 16 has collided with Turkish A310 on Stand 16. The A330 seems to have a damaged wing tip.
6 USAir 1587, we are an A320 on Golf just short of the intersection with Quebec. I think there is a stray dog near the threshold of Runway 25 Right.

16b **1.35**

KLM F/O: Wait a minute. We don't have an ATC clearance.
KLM Capt: No, I know. Go ahead, ask.
KLM F/O: Uh, the KLM 4805 is now ready for take-off and we're waiting for ATC clearance.
ATCO: KLM 8705, uh, you are cleared to Papa beacon. Climb to and maintain Flight Level 90 ... right turn after take-off, proceed with heading 040 until intercepting the 325 radial from Las Palmas VOR.
KLM F/O: Ah, roger. Sir, we're cleared to the Papa beacon Flight Level 90, right turn out 040 until intercepting the 325, and we're now at take-off.
KLM Capt: Let's go ... check thrust.
ATCO: OK ... Stand by for take-off ... I will call you.
Pan Am Capt: And we are still taxiing down the runway, the Clipper 1736.
ATCO: Ah ... Papa Alpha 1736, report runway clear.
Pan Am: OK, we'll report when we're clear.
ATCO: Thank you.
KLM F/O: Is he not clear then?
KLM Capt: What do you say?
Pan Am: Yup.
KLM F/O: Is he not clear, that Pan American?
KLM Capt: Oh, yes.

17a **1.36**

1 **A:** There is traffic coming from our right.
B: Can you identify it?
2 **A:** We're at our gate.
B: Which gate are you at?
3 **A:** I can hear a noise.
B: What sort of noise can you hear?
4 **A:** We are holding.
B: Where are you holding?
5 **A:** I can see something.
B: What can you see?

19 **1.37**

1 We have a deflated tyre.
2 This computer has crashed.
3 There are six meal trays missing.
4 The cabin looks very dirty.
5 The brakes are very hot.
6 We need a new weight and balance print-out.
7 The aircraft must be taken to the hangar for the repair.
8 There is an unruly and inebriated passenger in Row 17.
9 There is a container in the middle of our parking stand.
10 We have a passenger on board complaining of acute stomach pains.

20a **1.38**

ATCO: Hijet 451, taxi via outer taxiway to Stand one–seven.
F/O: Outer taxiway, Stand one–seven, Hijet 451.
ATCO: Hijet 451, for information, during your landing you had a big flame from your right engine.
F/O: Thank you. That's copied. We had some problems with our engine, so we will have a check done by our maintenance. Can you see anything now?
ATCO: There is still some smoke and occasional flames coming from the exhaust. The fire service is on its way. It is approaching you from the left.
F/O: Thank you very much.
ATCO: Hijet 451, stop there, please.
F/O: Roger. We are stopping, Hijet 451. For information, Engine Number 2, our right-hand engine is shut down.
ATCO: Thank you.
F/O: Hijet 451, is it still on fire?
ATCO: Hijet 451, could you shut down all engines now?
F/O: We are also shutting down Engine Number 1 Hijet 451.
ATCO: Thank you, sir. Can you change frequency to 121 decimal 85?
F/O: 121 decimal 85, Hijet 451.
Fire Officer: Quebec Oscar Kilo from Chief Fire Officer.
F/O: Go ahead.
Fire Officer: We have checked your right-hand engine. We have some flames at the rear of the engine. We are cooling it down. Would you like to disembark?
F/O: We have shut down both engines and discharged both fire agents. Yes, I think we'd like to disembark the passengers. Could you organise some stairs for us?
Fire Officer: There is actually no risk. We will continue to cool down the engine. We will put some stairs in place on the left, but on the right-hand side, please stand by to disembark by the slide.
F/O: OK. We will keep the slide armed on the right-hand side.
Fire Officer: OK. Just stand by in case of a degradation of the situation.
F/O: OK. Will do.
Fire Officer: Quebec Oscar Kilo from Fire Officer.
F/O: OK. Go ahead.
Fire Officer: We will organise the bus and stairs and we will keep standing by with my guys and the appliances.
F/O: OK. Thank you very much.

22 **1.39**

1 **Pilot:** Apron Control, Iberia 287, we have been waiting ten minutes now for Stand Bravo 18 to be vacated. Have you got an update?
2 **ATCO:** There is still some smoke coming out of the engine on your left-hand side. Advise intentions.
3 **Pilot:** Japan Air 084, taxiing to Stand Mike 13. We are at what we thought was our stand, but see that it is November 13. Can you give us new taxi instructions, please?
4 **ATCO:** Air France 219, the ambulance is on its way. What is the state of your passengers?
5 **ATCO:** Korean 793, I see that you are not moving on Taxiway Juliet. Do you have a problem? Do you require assistance?
6 **Pilot:** Ground Control, Transat 047. We have just vacated Runway 09 Right on exit Bravo 1. We noticed a blue pick-up truck parked on the extended threshold; the driver appeared to be changing a wheel. Is he on the manoeuvring surface?
7 **Pilot:** Apron Control, Fedex 375, have you got an update on our start-up? We are carrying livestock and would prefer to expedite our departure.
8 **ATCO:** China Eastern 888, confirm Runway 21 Left vacated. Report position.

Unit 4

2a, b **1.40**

1 Kuwait 979
2 China Southern 429
3 Air France 868
4 Emirates 6393
5 Lan 4213
6 Qatar 5797
7 Singapore 4031
8 Aeroflot 7951
9 Scandinavian 6833
10 Adria 1255

3a **1.41**

1 Finnair 482, line up Runway 21 Left, intersection Charlie.
2 Gulf Air 2351, taxi to holding point Alpha 1, Runway 12 Right.
3 Air India 1658, backtrack Runway 18 Left.
4 Korean Air 3738, cross Runway 09 Left. Report vacated.
5 China Southern 2664, behind Dragonair A320 on short final, Runway 23 Right, line up behind.
6 Emirates 5315, expedite crossing Runway 31 Left, A330 three miles final.
7 Lan 338, taxi to holding position Bravo 2, Runway 07 Left.
8 Midland 6478, line up Runway 29 Right. Be ready for immediate departure.
9 Egyptair 173, hold position, cancel take-off. I say again, cancel take-off.
10 Etihad 7481, turn first left and contact Ground 121 decimal 35.

5b, c **1.42**

1 Was that clearance meant for us? We haven't even reached the holding point yet.
2 Tower, we are at the far end of Taxiway November. According to our chart, we should be opposite Taxiways Romeo 5 and Romeo 6, but the paint on the paving is worn. Can you help us, please?
3 I didn't think we went past the General Aviation Terminal to reach Runway 28 Left.
4 Don't you think those instructions were strange? Well, I suppose they must be OK.
5 Do you think he understood our request? Perhaps we should call back and make sure.
6 I guess this is the active runway. The lighting is certainly brighter than the other one, but it's a bit difficult to be sure with all this snow.

9 **1.43**

A

1 Taxi to holding point Echo 2, Runway 28 Left via Taxiways *[Lima and Hotel]*.
2 Follow the *[Boeing 737]* coming from your left, taxi to holding point Delta 1 Runway 04 Right via Taxiway Golf.
3 Ground, *[Philippine 493]*, Information India, QNH 1018, request start-up.
4 Tower, Aviair 763, we are at the intersection of *[November and Tango]*. Request detailed taxi instructions to Runway 19 Left.
5 Tower, Finnair 2658, reporting a *[large flock of birds]* near the threshold of Runway 23 Right.
6 American 7*[69]*, Runway 07 Left, cleared for take-off. Report airborne on 121.95.
7 Germanwings 3627, line up and wait, Runway 26. *[Vehicle crossing]* centre intersection.
8 Ground, cleared for take-off Runway 33 Right, *[Kuwaiti 5319]*.

B

1 Mexicana 395, hold position, after departure maintain runway heading till through *[2,500 feet]* QNH 1006 then turn right.
2 Oman Air 274, hold at the *[holding point]*.
3 Cleared for take-off, *[Qantas 5389]*
4 Perm Air 4411, *[behind A320 on short final]*, line up behind.
5 Asiana 5841, contact Tower *[118.1]*.
6 Tower, All Nippon 369, *[backtracking]* Runway 24 Left.
7 Belarus Avia 337, taxi to holding point *[Charlie 2]*, line up and wait Runway 34 Left, *[Number 1 to depart before you]* from holding point Charlie 3.
8 CSA lines 627, we *[are still on]* Runway 07 Left.

12a **1.44**

1 The main generator has failed.
2 The active runway has just been closed.
3 There is a thunderstorm 12 miles west of the field moving our way.
4 I can't read this small print on the chart.
5 There seem to be flames coming from engine Number 4 on that 747 on Mike.
6 Taxiway Mike has been closed.
7 I have advised the fire service.
8 I got to work late this morning.

12b **1.45**

1 **A:** The main generator has failed.
B: We must switch over to the standby power supply.
2 **A:** The active runway has just been closed.
B: All the flights will be delayed.
3 **A:** There is a thunderstorm 12 miles west of the field moving our way.
B: Flights may be delayed.
4 **A:** I can't read this small print on the chart.
B: You should use your glasses.
5 **A:** There seem to be flames coming from engine Number 4 on that 747 on Mike.
B: Yes, I can see them.
6 **A:** Taxiway Mike has been closed.
B: All traffic must use November and Papa.
7 **A:** I have advised the fire service.
B: They will be with them in 90 seconds.
8 **A:** I got to work late this morning.
B: You should be on time tomorrow.

13a **1.46**

1 There is a Dash 8 leaving holding point November 4 to line up on Runway 09. And look, that A319 is already lined up on Runway 09 from November 5.
2 Tower, Lufthansa 375, line up runway 36 Centre. Be advised that there appears to be a runway maintenance car parked near exits W4 or W3.
3 The Air India A320 is ready for departure on Runway 09, but isn't that a tractor crossing the runway at November 2?
4 Tower, Executive 44, we are a Citation on Runway 22. You have just delivered our take-off clearance, but there is a Beechcraft entering the runway from Golf 2.
5 Tower, Mexicana 388, airborne 27. We only just managed to lift off and clear an ATR72 which had not fully vacated Runway 24 on exit Sierra 1.
6 KLM 189, going around. At 200 feet on final we saw an MD90 still vacating to the left at the far end of Runway 18 Centre.
7 Tower, Falcon 483, we have stopped our departure on Runway 22. There is a tug towing an Embraer to the maintenance area at the intersection with Golf 4.
8 Tower, Tunisair 045, confirm that we are at Number 1 for departure. We are lining up on Runway 24 from Sierra 7, but an Army Hercules seems to be entering the runway from Sierra 4.

17a **1.47**

1 Iberia 87 *[taxi to Runway 21 Left]* via Taxiway Lima *[and Oscar]* hold short of *[Runway 21 Left. Proceed with]* caution *[continue and hold short of]* Runway 21 Right.
2 Correction: BUZAD 2 Sierra departure. Climb straight ahead to altitude 3,000 feet. New QNH 1003.
3 I'm sure that's all right. We just haven't got the time to check it again if we're going to make our 45 slot.
4 **A:** Window heat.
B: High.
A: Anti-ice.
B: Open.
A: Pitot heat.
B: On and checked.
A: Yaw damper.
B: On and checked.
A: Ah, did you set the speed bugs?
5 I think we're all buttoned up down here and ready to go.
6 Heron 486, report ready for departure.
7 **A:** Kaunas 359, via holding point Bravo 1, line up and wait Runway 26. One aircraft to depart before you from holding point Bravo 2.
Issues clearance to Matra 227, in Arabic.
8 Taxi into position and hold, Runway 22.

20a, b **1.48**

1 Controllers use surface movement radar to monitor traffic on the ground.
2 Pilots use frequency 121.9 to contact Ground Control.
3 Controllers use call signs to identify individual aircraft.
4 Pilots use all their senses to create situational awareness.
5 Inertial navigation uses laser gyros to calculate aircraft position.
6 Controllers use electronic flight strips to manage separation and flow of traffic.
7 Controllers use binoculars to follow aircraft movements visually.
8 Pilot and controllers use VHF to communicate with each other.

21a **1.49**

1 The fire engines will be with you in 60 seconds. Can you see any flames as well as smoke from your left wing gear? Remain stationary on Taxiway November.
2 Tower, United 548, vacating Runway 26 Left by Bravo 2. We noticed tyre debris on the runway about 800 metres before the end. We had to swerve to avoid it.
3 Ground, Qantas 297, we encountered several patches of ice at the intersection of Taxiways Romeo and Tango. Advise other aircraft to taxi with caution.
4 Tower, Fedex 713, just landed Runway 13 Right. We have overshot the final turn-off. Request backtrack Runway 13 Right.
5 Ground, Scandinavian 483, there is an ATR 42 stopped on Taxiway Foxtrot 3 ahead of us. We have a tight departure slot. Can you advise on likely delay?
6 Tower, Air France 7255 holding at Runway 29 Right. The runway stop-bar lights here seem to be inoperative.

7 Ground, Cathay Pacific 398, the 737 ahead of us turning right onto Taxiway Golf seems to have its bulk cargo door not fully closed.
8 Aeroflot 5124, RVR Runway 18 Right 275 metres at midpoint.

Review A

1a **1.50**

1 We have quite a light load today.
2 Can you call for a ground cart?
3 We won't depart unless that baggage is offloaded.
4 The tyre pressure looks rather low.
5 I can feel the catering truck pushing against the fuselage.
6 Have the surfaces been de-iced?
7 I'll hand over to my colleague in five minutes.
8 We'll need at least ten more minutes.
9 I'll sign the loadsheet, then we can get away.
10 I'll sign the loadsheet, then we can get away.
11 They're in the rear cabin.
12 We're waiting while they change the wheel.
13 They'll have to change the detreaded tyre.
14 You must try and expedite your departure or you'll be into quiet hours.
15 Did you notice any steel debris on the edge of the runway?
16 Are you scheduled to fly tomorrow?
17 Make sure the tanks are full.
18 Did you notice any loose fittings during the walkaround inspection?
19 Did you feel that? What do you think it was?
20 Ask the engineer to clean the windshield, please.

1b **1.51**

1 light right 2 chart cart 3 won't want 4 low load 5 again against 6 services surfaces 7 hand land 8 least last 9 then than 10 way away 11 near rear 12 wheel will 13 tired tyre 14 quite quiet 15 steel still 16 fly flight 17 fuel full 18 lose loose 19 feel fill 20 clear clean

1c, d **1.52**

1 The rear hold door is open.
2 We'll need a marshaller to guide us into the stand.
3 Push back to face east.
4 We will require towing.
5 We can see a large flock of seagulls near the threshold.
6 There's a dog on the runway.
7 We can smell a strong odour.
8 We have a passenger on board complaining of stomach pains.
9 Do you require assistance?
10 There's a large oil spillage on the apron.

3a **1.53**

1 The tractor has arrived, but they can't connect it to our nose gear. Yes, we're waiting for them to bring one.
2 Sorry, it seems to be unserviceable at Gate 38. Don't worry, we're sending you a marshaller straight away to allow you to park.
3 Can you bring it back, please? A few last-minute bags have arrived to be loaded into the bulk hold ... yes, hold five.
4 You've given us clearance, but the red lights are still on.
5 I'll get ground handling to put some airstairs in place as it isn't working at Gate 24.
6 We've been waiting for almost fifteen minutes now and there's still no one to take us to the terminal!
7 I'm keeping my parking brake on until you confirm they're in place.
8 Stop where you are. I'm sending you someone to show you the way to the terminal.
9 I've still got the APU running and we've got a long turnaround. Can't you do anything about it?
10 The brake fans seem to have done the job and the temperature's dropped. I don't think we need it any more. Thanks all the same. I hope we haven't caused too much inconvenience.

3c **1.54**

1 One of the baggage containers has not been loaded.
2 The cabin crew has just performed a head count and three passengers are missing.
3 The steps were slippery this morning with the heavy rain and a passenger slipped and seems to have sprained her ankle.
4 I still haven't seen the weight and balance figures.
5 The electrical drive motor on the First Officer seat appears to be unserviceable.
6 We are ready for pushback and the tow-bar is connected, but there doesn't seem to be anyone on the tractor.
7 The cabin crew have just reported that there's an intoxicated and unruly passenger in the centre cabin.
8 A young mother has just boarded with two young children.

4a **1.55**

1 Due to heavy traffic, there will be delays in most departures this morning.
2 There's something on the taxiway ahead of us.
3 We weren't able to contact the Tower.
4 It sounds like there's some trouble in the cabin.
5 The aircraft ahead of us has stopped and is blocking the taxiway.
6 I think we have taxied to the wrong gate.
7 We have a problem with the weight and balance.
8 We require assistance.
9 We haven't been able to park on our stand.
10 Caution: the surface of Taxiway Juliet is contaminated near the intersection with Kilo.

5a **1.56**

A tractor was towing an MD11 aircraft from Terminal 2 on the south side of San Francisco International Airport to the run-up area on the east side of Runway 19 Left. The tractor driver had been authorised to tow via Taxiways Alpha and Bravo, turn right onto Taxiway Echo, and to hold short of the midpoint of Runway 01 Left / 19 Right on Taxiway Foxtrot 1.
At the same time, a Boeing 767 aircraft was cleared to line up on Runway 01 Left. A minute and a half later, the Boeing 767 was cleared for take-off. At that moment the tractor was crossing the holding position on Taxiway Foxtrot 1, proceeding to cross Runway 01 Left / 19 Right in accordance with his authorisation. The tractor driver saw the 767 in position on the runway but it did not appear to be moving until he was so far onto the runway that he had no alternative but to continue to cross in order to vacate the runway as quickly as possible.
After beginning their take-off run, the flight crew of the Boeing 767 saw the tractor and the towed MD11 entering the runway. They rejected the take-off, reaching a speed in excess of 70 knots, 2,000 feet down the runway, 2,500 feet from Taxiway Foxtrot. When the tractor cleared the runway, the aircraft had slowed to less than 40 knots, and was 800 feet from Taxiway Foxtrot. The 767 vacated the runway at Taxiway Juliet.

5b **1.57**

A Boeing 747 dash 400 cargo aircraft arrived from Tokyo and landed at 21:25 hours on runway 14 Left at Chicago O'Hare. During the landing roll, the crew was instructed by Air Traffic Control: '... taxi Bravo, Mike and hold short of Runway 09 Right / 27 Left' to reach the south-west cargo area. The crew replied: 'Taxi Bravo, Mike and ... er ... hold short of Runway 09 Right / 27 Left ...' The controller later gave further instructions: 'On Tango ... Runway 14 Right'.
The crew replied: 'On Tango ... er ... cross Runway 14 Right'. According to the crew, at this time the B747 was on Taxiway Tango 11, south of Runway 09 Right / 27 Left.
Immediately afterwards, another controller issued take-off clearance to a Boeing 737 on Runway 14 Right.
The Boeing 737 crew stated that reverse thrust and wheel brakes were used to decelerate the aircraft when they saw the 747 at the far end of the runway.
The ground radar recording showed that the distance between the two aircraft had been about 1,500 feet.

Unit 5

3a **2.01**

1 Wind 170 degrees, 12 knots, gusting to 18 knots.
2 Visibility two kilometres, overcast 400 feet.

3 Incoming flights have been reporting sudden changes in wind speed and direction and downdraughts over the last mile to touchdown.
4 Winds from the north-east are causing the runway surface to be covered in snow in some places and some runway markings to be hidden.
5 Be advised that the snow layer and bright sun are making visibility difficult.
6 An Aer Lingus Boeing 737 which has just landed, had its windshield and radome damaged by ice pellets during the descent.
7 There has been a shift in wind direction and the approach path may be affected by fumes coming from the factory chimneys to the south-west.
8 You may experience some light rain during the final descent.

3c **2.02**

1 thick smoke
2 scattered cloud
3 heavy rain
4 severe turbulence
5 deep standing water
6 bright glare
7 poor visibility
8 strong wind
9 scattered showers
10 thick fog

5b **2.03**

1 Metar for Buffalo Niagara recorded at one seven five five Zulu. Wind two one zero degrees at one six knots, gusting two four, varying between one eight zero and two four zero degrees. Visibility one statute mile, RVR Runway one-one in excess of six thousand feet. Light rain and mist. Cloud one thousand five hundred broken, two thousand five hundred overcast. Temperature six, dew point four, Altimeter two niner niner zero.
2 Metar for Krakow recorded at one eight zero zero Zulu. Wind one two zero degrees six knots. Visibility one thousand four hundred metres. RVR Runway one-two in excess of one thousand five hundred metres to the North. Heavy snow. Cloud, broken one thousand seven hundred feet. Temperature minus four, dew point minus seven. QNH one zero two zero. No sig.
3 TAF for Recife at zero eight zero one Zulu, Wind two one zero degrees at one two knots. Visibility more than ten kilometres. Cloud broken one thousand feet. Light rain, broken eight hundred feet, temporarily between one two zero zero and one eight zero zero Zulu, scattered zero one five.

5c **2.04**

1 Metar for Bordeaux at zero eight five zero Zulu. Wind two one zero degrees at one two knots. Visibility more than ten kilometres. Cloud broken at two thousand three hundred feet. Temperature two zero. Dew point one four, QNH one zero one seven.
2 Metar for Karachi at one two two five Zulu. Wind one eight zero degrees at six knots. Visibility eight kilometres. Cloud scattered at three thousand feet, scattered at ten thousand feet. Temperature three four. Dew point two niner, QNH one zero zero two.
3 Metar for Seoul at one two zero zero Zulu. Wind two zero zero degrees at one one knots. Visibility more than ten kilometres. Cloud broken at three thousand seven hundred feet. Temperature one seven. Dew point one three, QNH one zero two two.
4 Metar for Fujairah at one two zero zero Zulu. Wind one zero zero degrees at nine knots varying from zero four zero to one three zero degrees. Visibility six kilometres. Cloud few two thousand five hundred feet. Temperature three four. Dew point two five, QNH one zero zero one hectoPascal, two niner five five inches of mercury.
5 Metar for Maastricht at one three five zero Zulu. Wind two one zero degrees at eight knots varying from one six zero to two five zero degrees. Visibility more than ten kilometres. Cloud broken eight hundred feet. Temperature one seven. Dew point one four, QNH one zero one niner.
6 Taf for Dubai at one zero five six Zulu. Valid from one two zero zero on the eighth to one eight zero zero Zulu on the ninth. Wind three four zero degrees at one two knots. Visibility eight kilometres, no significant cloud, becoming between one five zero zero and one seven zero zero. Wind one zero zero degrees at seven knots, becoming between zero eight zero zero and one zero zero zero. Wind three five zero degrees at one two knots, becoming between one five zero zero and one seven zero zero on the ninth. Wind one one zero degrees at eight knots.
7 Taf for London City at zero eight zero zero Zulu. Valid from zero niner zero zero to one eight zero zero. Wind one eight zero degrees at one zero knots. Visibility more than ten kilometres. Cloud few three thousand feet, becoming between zero niner zero zero and one two zero zero. Wind one niner zero degrees at two zero knots gusting three two knots. Probability thirty percent, temporarily between one two zero zero and one eight zero zero. Visibility eight kilometres in rain showers.

7a **2.05**

1 NZCH (*Christchurch*) Departure Information Golf, issued at 2200 Zulu. Departure runway 20. Surface wind 110 degrees, 20 knots. Visibility 5,000 metres. Haze. Cloud scattered 3,000 feet; broken 11,000 feet. Temperature 12. Dew point 10. QNH 1001.
2 Good afternoon, Prague, ATIS Information Lima 1059. ILS approach runway in use 24. Runway is wet. Transition level 50. Runways 13 and 31 closed. METAR Praha issued at 11:00. Wind 340 degrees, 14 knots. Visibility ten kilometres or more. Light rain showers. Cloud few 500 feet. Few cumulonimbus 1,500 feet. Broken 4,000 feet. Temperature 15. Dew point 14. QNH 1019 hectoPascal. Recent thunderstorm. NOSIG. You have received ATIS Information Lima.

13a **2.06**

1 1:39 pm – Comair 580 is nearing its turn for an approach to landing.
2 1:40 pm – The airport loses power and the controllers lose contact with Comair 580. The pilot misses his place in the landing sequence.
3 1:41 pm – Comair 580 heads south.
4 1:42 pm – Comair 580 continues off course, flying south.
5 Approximately 1:43 pm – Controllers re-establish contact with Comair 580.
6 Approximately 1:44 pm – Controllers direct pilot to begin turn to head north to go around the storm.
7 1:45 pm – Tornado hits Embry-Riddle next to airport.
8 1:46 pm – Comair 580 heads north. Controllers then direct the plane up to a point near Flagler County and bring it back to land safely on a different runway.

14a, b **2.07**

1 Freezing rain is expected at destination.
2 There is strong windshear on approach.
3 The current ceiling is 300 feet.
4 There is solid cloud from 1,000 to 6,000 feet.
5 There is moderate to severe icing in clouds.
6 Gusty winds have been reported on the approach path.
7 Wind 150 degrees, 18 knots, gusting to 23 knots.
8 There are thunderstorms in the vicinity of Kuala Lumpur.
9 There is a fifty-mile volcanic cloud moving south-west from Iceland.
10 There are snow flurries at destination.

17a **2.08**

The B747-400 was being operated by Qantas on a scheduled flight from Singapore. Shortly before the flight crew began their descent from cruise altitude at 18:57 local time, they reviewed the latest routine weather report for Sydney. Issued at 18:30, the METAR indicated that the surface winds were from 030 degrees at 17 knots and that there were thunderstorms 18 nautical miles south-west of the airport, moving east-north-east at 15 knots.
As the 747 neared Sydney, the aerodrome traffic controllers received several windshear reports. The 747 crew was on an approach control frequency and did not receive the new ATIS information with the windshear report.
The aircraft was about three nautical miles from the runway at 19:22, when the crew told Control West that they were on final approach to Runway 16

Right. Control advised the crew that the wind at the landing threshold was 180 degrees at 22 knots, issued a clearance to land and requested a wind readout. The crew reported that the wind at 1,000 feet was a 20-knot tailwind. The co-pilot disengaged the autopilot and auto-throttles at 780 feet and asked the pilot-in-command for continuous callouts of wind data. The pilot-in-command's callouts indicated that the wind changed from a tailwind to a 15-knot headwind at 500 feet and to an increasing right crosswind at 120 feet.
The approach had been stable until the 747 encountered overshoot windshear followed by undershoot windshear. Recorded flight data indicated that calibrated airspeed increased from about 146 knots to 159 knots at 120 feet and then decreased at a steady rate during the next six seconds to 131 knots on touchdown. Reference landing speed was 144 knots. The report said that the crew could not have avoided the hard landing. The recorded sink rate was 820 feet per minute and vertical acceleration was 2.34g when the main gear contacted the runway. The pilot-in-command's decision to go around was appropriate and in accordance with company procedure.

18a **2.09**

1 The co-pilot asked the pilot-in-command to call out the wind data.
2 The crew must always read back instructions.
3 After V1, the crew must take off whatever happens.
4 The calibrated airspeed decreased at a steady rate during the next six seconds to 131 knots on touchdown.
5 The GPWS said, *Pull up, pull up.*
6 The pilot-in-command made a regular call-out every 30 seconds.
7 The pilot-in-command's decision to go around was appropriate.
8 The controller issued a clearance to land and requested a wind read-out.

18b **2.10**

1	a call-out	b call out
2	a readback	b read back
3	a take-off	b take off
4	a touchdown	b touch down
5	a pull-up	b pull up
6	a roll-out	b roll out
7	a go-around	b go around
8	a readout	b read out

21a, b **2.11**

The aircraft departed from Christchurch on schedule at 20:32. The captain was pilot flying. At 21:08 at Flight Level 210, the co-pilot requested clearance from Wellington Control to fly directly to PAR. The Wellington controller approved the request and told the crew to descend to FL 130. At 21:22, the controller told the crew to descend to 11,000 feet.
The aircraft was descending at about 1,500 feet per minute; ground speed was between 247 knots and 251 knots. The co-pilot told Ohakea Control that they were conducting a descent to 11,000 feet. The Ohakea controller told the crew to continue the descent to 7,000 feet. The controller also issued route instructions and an altimeter setting for Palmerston North. The co-pilot read back the route instructions but not the altimeter setting.
The Flight Data Recorder showed that moderate turbulence had been encountered during the descent.
The Ohakea controller observed on his radar screen a loss of data from the aircraft's transponder. The report said that a build-up of ice on the transponder likely obstructed transmission of data to ATS.
The Ohakea controller again issued the altimeter setting but received no response from the co-pilot. The controller observed the aircraft's primary radar target begin a left turn; the aircraft's target then disappeared from the controller's screen.

NOTE: Since 2004, New Zealand's transition altitude is 13,000 feet and transition level is FL 150.

24a, b **2.12**

1 **Reduce thrust to idle immediately**
By reducing thrust, engines may suffer less build-up of molten debris on turbine blades and hot-section components. Idle thrust allows engines to continue producing electrical power, bleed air for pressurisation, and hydraulic power for airplane control.
2 **Turn the autothrottles off**
This prevents the engines from increasing thrust above idle. Ash debris in the engine can result in reduced surge margins, and limiting the number of thrust adjustments improves the chances of engine recovery.
3 **Exit the ash cloud as quickly as possible**
A 180-degree turn out of the ash cloud using a descending turn is the quickest exit strategy. Many ash clouds extend for hundreds of miles, so assuming that the encounter will end shortly can be false. Climbing out of the ash could result in increased engine debris build-up as the result of increased temperatures. The increased engine build-up can cause total thrust loss.
4 **Turn on engine and wing anti-ice devices and all air-conditioning packs**
These actions improve the engine stall margins by increasing the flow of bleed air.
5 **If possible, start the Auxiliary Power Unit (APU)**
The APU can power systems in the event of a multiple-engine power loss. It can also be used to restart engines through the use of APU bleed air.
6 **If volcanic dust fills the flight deck, the crew may need to use oxygen**
Use flight deck oxygen at the 100 per cent setting. Manual deployment of the passenger oxygen system is not required because it will deploy automatically if the cabin altitude exceeds 14,000 feet.

Unit 6

2a **2.13**

1 The flight is cleared to climb from below the transition altitude to a flight level above it. The pilot sets standard pressure setting and commences the climb. The ATCO re-clears the flight to level at an altitude below the transition altitude. The pilot levels at the re-cleared level, but with the standard pressure setting still set.
2 The flight is cleared to descend from above the transition level to an altitude that is below it. The pilot sets QNH and commences the descent. The ATCO re-clears the flight to a flight level above the transition level. The pilot levels at the re-cleared level but with QNH still set.
3 The ATCO issues a clearance to climb or descend to a specified flight level and the pilot follows this clearance. Subsequently, the ATCO instructs the pilot to level at an intermediate flight level but at the time of this re-clearance the flight has passed the re-cleared flight level.

3a **2.14**

1 **ATCO:** Air France 3762, climb Flight Level 210.
Pilot: Climb Flight Level 210, Air France 3762.
ATCO: Air France 3762, correction: climb and maintain Flight Level 190. I say again Level 190.
Pilot: We have already passed Level 190. Returning to Level 190, Air France 3762.
2 **ATCO:** Emirates 5371, climb to altitude 5,000 feet.
Pilot: Climbing to altitude 5,000 feet, Emirates 5371.
ATCO: Emirates 5371, confirm your cleared altitude.
Pilot: Cleared altitude is ... 6,000 feet ...
ATC: Descend. Descend immediately to altitude 5,000 feet.
Pilot: Expediting descent to 5,000 feet, Emirates 5371.
3 **ATCO:** Japan Air 1956, confirm your cleared level.
Pilot: Cleared level is 130, Japan Air 1956.
ATCO: Negative. You were cleared to Flight Level 140. Climb back immediately to Flight Level 140.
Pilot: Flight Level 140, wilco, Japan Air 1956.
4 **ATCO:** Air China 3776, descend to altitude *[4,000 feet, expect]* 3,000 feet in two minutes.
Pilot: Descending to altitude 3,000 feet, Air China 3776.
ATCO: Say again your cleared altitude.
Pilot: Cleared to altitude 3,000 feet, Air China 3776.
ATCO: Negative. You are cleared to altitude 4,000 feet. I say again 4,000. Climb back immediately. Expect altitude 3,000 feet in two minutes.

Pilot: Have stopped descent. Returning to altitude 4,000 feet, Air China 3776.

5 **ATCO:** Delta 1982, climb Flight Level 090.
Pilot: Climbing to Flight Level 090, Delta 1982.
ATCO: Delta 1982, correction. Stop climb at Flight Level 080. You have traffic at 12 o'clock.
Pilot: We have passed Level 080. Descending Flight Level 080, Delta 1982.

6 **ATCO:** Air Canada 5718, stop descent at altitude 6,000 feet. Traffic below. Let me know when you're climbing again and maintain.
Pilot: Stopping descent. We will climb back to altitude 6,000 feet, Air Canada 5718.

7a **2.15**

On November 12th, at around 16:38, an MD-81 en-route from Denmark entered the Lambourne (Lima-Alpha-Mike) holding pattern prior to making an approach to land at London's Heathrow Airport. Two minutes later a Boeing 737-400 from Amsterdam, also bound for Heathrow, called on the same frequency and was also instructed to hold at Lima Alpha Mike. The MD-81 was instructed to descend to Flight Level 140 and subsequently reported at that level. The Boeing 737 was then instructed to descend to Flight Level 150, and this instruction was correctly read back by the crew. 1,000-feet vertical separation is the minimum permitted in this airspace.
But by 16:44 vertical separation had reduced to 100 feet and the two aircraft had closed to around 750 metres horizontally. The Boeing 737, at its lowest, had descended to 14,052 feet (1013 hectoPascal). The controllers were devoting their attention to other flights. Their attention was drawn to the incident when an automatic system, the 'Short Term Conflict Alert', activated to indicate that there was a possible imminent loss of separation requiring immediate attention. The Boeing 737 successfully climbed back to Flight Level 150.

8a **2.16**

1 **ATCO:** Speedbird 5673, climb to Flight Level 150.
Pilot: Climb Flight Level 190, Speedbird 5673.
ATCO: Speedbird 5673, negative. Climb to Flight Level 150.
Pilot: Roger. Climb to Flight Level 150, Speedbird 5673.

2 **ATCO:** Aeromexico 3645, climb to Flight Level 250.
Pilot: Climb to Flight Level 290, Aeromexico 3645.
ATCO: Report on reaching.

8b **2.17**

1 **ATCO:** Cedar Air 385, climb to altitude 5,000 feet.
Pilot: Climb altitude 9,000 feet, Cedar Air 385.

2 **ATCO:** KLM 4388, descend and maintain Flight Level 250.
Pilot: Descend and maintain Flight Level 250, KLM 4833.

3 **ATCO:** Shuttle 771, Contact Riga Approach 129.400.
Pilot: Contact Riga Approach 125.900, Shuttle 771.
ATCO: Shuttle 771, negative. Contact Riga Approach 125.400.
Pilot: Roger. Contact Riga Approach 125.400, Shuttle 771.

4 **ATCO:** Shenzhen 3851, hold at Huzhou Flight Level 190. Expect onward clearance at time 25. Landing delays at Shanghai 20 minutes.
Pilot: Hold at Huzhou Flight Level 190. Expect onward clearance at 20, Shenzhen 3851.
ATCO: Shenzhen 3851, negative. Expect onward clearance at 25. Delays at Shanghai 20 minutes. Hold at Huzhou Flight Level 180.
Pilot: Expect onward clearance at 25. Holding at Huzhou Flight Level 180, Shenzhen 3851.

5 **ATCO:** Tarom 458, monitor 128.375 for ATIS.
Pilot: Monitor 128.575 for ATIS, Tarom 458.

6 **ATCO:** Spanair 3658, avoiding action, turn left immediately, heading 290, traffic at two o'clock five miles crossing right to left.
Pilot: Left heading 250, Spanair 3658.

7 **ATCO:** Vietnam Airlines 873, maintain Flight Level 270. Squawk 5251.
Pilot: Maintain Flight Level 270, squawk 5271, Vietnam Airlines 873.

8 **ATCO:** Air Madagascar 663, descend to altitude 5,000 feet. Dar es Salaam QNH 1003. Report entering the hold.
Pilot: Descend to altitude 5,000 feet. Dar es Salaam QNH 1013. Wilco, Air Madagascar 663.

NOTE: Some states have adopted *degrees* after a heading, but ICAO considers this to be redundant.

9a, b **2.18**

1 Approaching Vienna, an aircraft was cleared to descend to 3,000 feet for ILS 29 approach. The pilot misheard the clearance and selected 2,000 feet on the Mode Control Panel. The aircraft descended 600 feet below the assigned altitude before climbing back to 3,000 feet.

2 During climb from Flight Level 310 to Flight Level 330, Flight 478 was re-cleared to Flight Level 370, which was read back and accepted. Passing Flight Level 350, ATC requested the crew to maintain Flight Level 330 and advised that the clearance to climb should have been for Flight 578.

3 An aircraft was cleared by Lisbon to descend to Flight Level 270 and subsequently re-cleared to stop descent at Flight Level 300 while passing Flight Level 302 with a high rate of descent. The aircraft was levelled by Flight Level 298.

4 On climb-out from Brussels, one aircraft encountered heavy rain and up-draught during level-off, causing an altitude deviation of 230 feet.

5 Departing London Heathrow, an aircraft was cleared to 6,000 feet on QNH 988. The crew requested climb to avoid weather and were cleared to Flight Level 120. Approaching level-off, the crew received a TCAS RA 'Descend'. When clear of the conflicting traffic, the crew realised that they had forgotten to set the standard pressure setting. The traffic had passed 700 feet above them.

6 On climb-out from Glasgow, a crew thought their aircraft had been cleared from Flight Level 070 to Flight Level 140 and read back the clearance. On passing Flight Level 078, ATC told the crew to stop at Flight Level 080, informing them that they had taken someone else's clearance.

10 **2.19**

1 They were 600 feet below.
2 We are climbing back.
3 Gulfair 5476, descend to Flight Level 270.
4 We are approaching level-off.
5 Shamrock 596, cleared to descend Flight Level 310.
6 Request turn left to avoid weather.
7 We are 700 feet above them.
8 You took someone else's clearance.
9 We are climbing from Flight Level 070 to Flight Level 140.
10 We have a high rate of descent.

12a, b, c **2.20**

1 Caution: prohibited area eight miles ahead.
2 Report your heading to Hamburg Control.
3 After the departing 767, line up and hold.
4 Unable to give you a clearance to proceed direct, but you can cross under your own responsibility.
5 Traffic is ATR 72, 11 o'clock, five miles.

13b, c **2.21**

1 **ATCO:** Uzbek 952, climb and maintain Flight Level 370.
Pilot: Climb and maintain Flight Level 370, Uzbek 952.

2 **ATCO:** Saudia 374, cleared to the 104 radial of the Alpha Delta November VOR at one-eight miles DME fix.
Pilot: Cleared radial 104, Alpha Delta November VOR, one-eight miles DME fix, Saudia 374.

3 **Pilot:** Climbing back to altitude 7,000 feet, Midland 3871.
ATCO: Midland 3871, report on reaching.

4 **ATCO:** Varig 2694, how many passengers do you have on board?
Pilot: We have 274 passengers on board.

5 **ATCO:** Southwest 3768, after the landing 737, line up.
Pilot: After landing 737, lining up, Southwest 3768.

6 **ATCO:** China Southern 581, climb Flight Level 290. Correction: Flight Level 270.

Pilot: Roger, climb Flight Level 270, China Southern 581.

7 **Pilot:** Speedbird 5887, request straight-in ILS approach Runway 27 Right.
ATCO: Speedbird 5887, cleared straight-in ILS approach Runway 27 Right.

16 **2.22**

1 **ATCO:** Qatar 473, avoiding action, turn left heading 270. Traffic 12 o'clock six miles.
Pilot: Left heading 270, Qatar 473.
2 **ATCO:** Jet Blue 857, climb back now and maintain altitude 4,000 feet, contact Approach 126.375.
Pilot: Climb and maintain 4,000 feet, Jet Blue 857.
3 **ATCO:** Emirates 486, stop climb at Flight Level 290, contact Atlanta Centre on 135 decimal 625.
Pilot: Stop climb Level 290, contact Atlanta 135 decimal 625, Emirates 486.
4 **ATCO:** Scandinavian 656, descend and maintain altitude 3,000 feet, reduce speed to 190 knots.
Pilot: Descend and maintain 3,000 feet, reducing speed to 190 knots, Scandinavian 656.
5 **ATCO:** Air France 283, expedite climb until passing Flight Level 140 and radar heading 040.
Pilot: Expediting climb until passing Flight Level 140, radar heading 040, Air France 283.
6 **ATCO:** United 939, correction: set QNH 993 hectoPascal, contact Approach on 119.3.
Pilot: Roger. We had our altimeter set in inches of Mercury at 29.93. Setting QNH 993 hectoPascal. Will contact Approach on 119 decimal 3, United 939.
7 **Pilot:** Leaving Flight Level 240 for Flight Level 140, Luxair 166.
ATCO: Luxair 166, negative. Maintain Flight Level 240.
8 **ATCO:** China Southern 838, stop descent and maintain Flight Level 090, fly heading 190.
Pilot: Have passed through Flight Level 090. Climbing back to 090, heading 190, China Southern 838.

18a, b **2.23**

1 **ATCO:** Silkair 4739, climb now to Flight Level 140.
Pilot: We responded to a TCAS Resolution Advisory. Confirm that we are clear to climb back to Flight Level 140, Silkair 4739.
2 **ATCO:** Laser 629, stop descent now. You were cleared to altitude 9,000 feet. Climb to altitude 9,000 feet.
Pilot: The purser was in the flight deck. We have a female passenger suffering from acute stomach pains. Request medical assistance on arrival. Climbing to altitude 9,000 feet, Laser 629.
3 **ATCO:** Oman Air 5837, descend and maintain Flight Level 110.
Pilot: Descend and maintain Flight Level 110, Oman Air 5837.
ATCO: Oman Air 5837, confirm your present altitude; we are showing you at Flight Level 100.
Pilot: Affirm. Flight Level 100, Oman Air 5837.
ATCO: Oman 5837, we cleared you to Flight Level 110. I say again 110. Climb now to Level 110. Expect Level 090 at 17.
Pilot: Sorry, we set 100 on the autopilot panel. Climbing now, Oman Air 5837.
4 **ATCO:** Russia 5296, climb Flight Level 290.
Pilot: Climb Flight Level 290, Russia 5296.
ATCO: *[inaudible]*
ATCO: Russia 5296, we instructed you to maintain Flight Level 230. Descend Flight Level 230 immediately.
Pilot: Descending Flight Level 230. We did not hear your instruction.
5 **ATCO:** Korean Air 3659, climb and maintain Flight Level 390.
Pilot: Climb and maintain Flight Level 390, Korean Air 3655.
ATCO: Korean Air 3655, maintain present level. That instruction was not intended for you.
6 **ATCO:** Corsair 3668, descend to and maintain altitude 9,000 feet. Contact Tower 118.325.
Pilot: Descend to and maintain 5,000 feet, Tower 118.325, Corsair 3668.
ATCO: Corsair 3668, confirm your cleared level, please.
Pilot: Cleared to altitude 5,000 feet, Corsair 3668.
ATCO: Corsair 3668, negative. Climb now to altitude 9,000 feet. I say again niner thousand.

19a, c **2.24**

1 We are still above our maximum landing weight.
2 We are en-route for Caracas.
3 I do not know what happened.
4 I'm feeling tired – I need a break.
5 The level bust was due to confused call signs.
6 There are relief crews standing by.
7 What was that noise? Did you hear that, too?
8 Did you hear anything unusual?
9 We are climbing to Flight Level 190.
10 Traffic is not allowed during quiet hours.

Unit 7

3a, b **2.25**

ATCO: Cactus 1549, turn left heading two – seven – zero.
US 1549: This is Cactus 1539; hit birds; we lost thrust in both engines; we're turning back towards LaGuardia.
ATCO: OK, you need to return to LaGuardia. Turn left heading of two – two – zero.
US 1549: Two – two – zero
ATCO: Tower, stop your departures; we've got an emergency returning.
LaGuardia Tower: Who is it?
ATCO: It's 1529, it's ... he ... er, bird strike; he lost all engines, he lost the thrust in the engines ... he's returning immediately.
LaGuardia Tower: Cactus 1529, which engines?
ATCO: He lost thrust in both engines, he said.
LaGuardia Tower: Got it.
ATCO: Cactus 1529, if we can get it for you, do you want to try to land on Runway 13?
US 1549: We're unable; we may end up in the Hudson.
...
ATCO: All right, Cactus 1529, it's going to be left traffic to Runway 31.
US 1549: Unable
ATCO: OK. What do you need to land? ... Cactus 1549, Runway 4 is available, if you want to make left traffic to Runway 4.
US 1549: I am not sure if we can make any runway. Oh, what's over to our right? Anything in New Jersey? Maybe Teterboro?
ATCO: OK. Off to your right side is Teterboro Airport. ... Do you want to try to go to Teterboro?
US 1549: Yes
...
ATCO: Cactus 1529, turn right, two – eight – zero, you can land Runway 1 at Teterboro.
US 1549: We can't do it.
ATCO: OK. Which runway would you like at Teterboro?
US 1549: We're going to be in the ... Hudson.
ATCO: I'm sorry, say again, Cactus.

4a, b **2.26**

1 We lost thrust in both engines and are turning back to LaGuardia.
2 We had a sudden cabin depressurisation and are making an emergency descent.
3 We saw a thunderstorm ahead of us and we are turning 20 degrees right to avoid it.
4 We felt a loud thud from Engine 2 during climb-out and are checking the engine parameters.
5 ATC told us to take delaying action and we are orbiting at the moment.
6 ATC cleared us to FL 390 and we are climbing now.
7 We smelt smoke in the flight deck and we are donning our oxygen masks.
8 Area Control handed us over to Approach and we are contacting them on 118.325.

7a, b **2.27**

1 If the engines relight, do you want to continue your flight?
2 If the icing continues, do you want to climb out of the cloud layer?
3 If your passenger's pain continues, do you want to divert to the nearest airport?

4 If you cannot re-pressurise the cabin, do you want to make an emergency descent?
5 If the smoke does not stop, do you want to declare an emergency?
6 If there is a severe storm ahead, do you want to change heading?
7 If the visibility is good, do you want to make a visual approach?
8 If you are not sure the gear is down, do you want to make a flypast?

8 **2.28**

1 relight the engine
2 climb at the moment
3 wait much longer
4 maintain this level
5 stabilise our descent
6 avoid the bad weather
7 increase our rate of descent
8 make up the delay
9 cross Papa India Lima at 34
10 extend the flaps to 40 degrees
11 stay in the hold
12 make our alternate
13 put out the fire
14 go around
15 decrease our speed any more

10 **2.29**

1 Midland 1263, turn left heading 160.
2 Shanghai Air 1637, climb Flight Level 350.
3 TAM Express 3971, turn right heading 340.
4 Iberia 4473, descend and maintain FL 210.
5 Swiss 1648, climb and maintain Flight Level 390.
6 Malaysian 377, vectoring ILS approach Runway 12 Left.
7 Air Canada 2695, orbit right.
8 Air Algérie 341, descend to altitude 3,000 feet.
9 Speedbird 3774, reduce your speed to 180 knots.
10 Olympic 3345, turn right heading 210.

11c, d **2.30**

1 You are flying an eastbound transatlantic flight at night.
2 You are established in cruise at Flight Level 350.
3 The first alternate is an airport at 90 degrees West.
4 What is your diagnosis of the situation?
5 You assume the oil loss is real and contact Dispatch.
6 You consider alternatives, such as flying back 150 minutes.
7 It is likely an indication problem.
8 You consult the Flight Crew Operating Manual.

12a **2.31**

You are flying an eastbound ETOPS transatlantic route at night. The flight is planned for a northerly route to benefit from upper-level winds toward Europe. You are established in cruise at Flight Level 350. The first alternate is an airport at 90 degrees West. Approaching 90 degrees West, you notice that oil quantity is dropping on the number two engine. At this point, you look in the logbook and notice no oil has been added for some time, indicating a good engine.
What is your diagnosis of the engine oil situation? You assume the oil loss is real and contact Dispatch. The reply from Dispatch is that it is likely an indication problem.
However, the fall in oil quantity does not stop. You consider alternatives, such as: flying back 150 minutes; diverting to another airport 120 minutes away with a 7,500-foot runway but good facilities; diverting to another airport that it is possible to reach in a short time, although with poor weather; or continuing the flight.
What is your decision?

12c **2.32**

You decide to continue, and inform Dispatch. You collect all weather data at alternate airports while discussing diversion options. You decide to divert at the first indication of any other problems.
Some 15 minutes later, number two engine oil pressure starts to drop.
What is your next move in view of the developing situation?
You decide to divert and transmit a 'pan' call, requesting clearance to an airport 313 nautical miles south-west. Iceland Control gives an immediate clearance via HF.
What task sharing are you implementing at this stage?
You advise the cabin crew. They prepare promptly for the landing and inform the passengers of the precautionary diversion. You initiate a drift down, throttling back the Number 2 engine, rather than shutting it down.
ATC offers an early localizer intercept at your discretion.
The landing is carried out without any incidents. Inspection of the engine later shows a rupture between the main oil filter and the engine supply line, with four litres of oil remaining after shutdown. Although the engine was not shut down during the incident flight, no damage resulted.

14a **2.33**

In an incident described as typical of the risks of not speaking the same language, the crew of a Boeing 737 had difficulty communicating with British air traffic controllers after their electronic flight displays went blank in instrument meteorological conditions following departure from London Heathrow airport. No one was injured and the airplane was not damaged in the incident, which involved a 27-minute return flight to Heathrow, where the airplane landed safely. While the commander worked to resolve the problem, the co-pilot flew the airplane by reference to the standby instruments.
At one point in the flight, as the airplane was flown north instead of north-northeast as directed, it came into conflict with another aircraft, whose crew was issued revised instructions to maintain separation.
During the flight, there were a number of exchanges between the pilots and the controller in which it was apparent that the commander, who was making the radio calls, was not able to understand some of the instructions.
The ATC controller became concerned that the airplane's flight path indicated that the flight crew might be planning to land on Runway 09 Right and asked that all traffic be cleared from the runway.
The airplane subsequently landed on Runway 09 Left and taxied to a parking stand.

15 **2.34**

1 **ATCO:** Report the situation on board.
Pilot: Report ... passenger ... bad.
2 **ATCO:** Do you require assistance?
Pilot: Assistance? ... necessary ... smo ... smo ...
3 **ATCO:** How many passengers do you have on board?
Pilot: Passengers ... yes ... good.
4 **ATCO:** Ankara Area Control, pass your message.
Pilot: Problem ... engine ...
5 **ATCO:** Report flight conditions.
Pilot: Conditions ... bad ... severe.
6 **ATCO:** Hold at Nolen, altitude 7,000 feet. Expect onward clearance 18, landing delays 25 minutes.
Pilot: Hold ... unable ... fuel ... low.

19a **2.35**

1 Maintain your present flight level?
2 A straight-in approach?
3 Stabilise your approach?
4 Give radar vectors to the nearest landing place?
5 Provide assistance?
6 Make a low pass?
7 Update our flight plan?
8 Cross Richmond level at Flight Level 190?
9 Increase to 2,000 feet per minute?
10 A higher level?

Review B

1a, b **2.36**

1 The co-pilot asked the pilot in command to call out the wind data.
2 The approach had been stable until the 747 encountered overshoot windshear.
3 Incoming flights are reporting a bumpy ride.
4 Have you suffered any material damage from the hail?
5 Remaining outside controlled airspace.
6 We've got a 767 climbing to Flight Level 290.
7 Say again your cleared altitude.
8 We had passed Flight Level 080.
9 The southbound traffic passes right underneath the Lambourne hold.
10 The Boeing 737 climbed back to Flight Level 150.

1c **2.37**

1 Leaving Flight Level 290, for Flight Level 250, Air Alpha 362.
2 China Southern 3496, how many passengers do you have on board?
3 Air Berlin 376, correction: set QNH, 989 hectoPascal, contact Approach 119.325.

4 The autopilot was disconnected, and the aircraft levelled, at Flight Level 138.
5 Shenzhen Air 3974, avoiding action, turn left immediately, heading 140.
6 Cleared level is 190, Japan Air 2875.
7 Spanair 4576, you have traffic, at your 10 o'clock position, descending towards you.
8 Tower, stop your departures, we've got an emergency returning.
9 Hold at Nolen, altitude 7,000 feet, expect onward clearance at 38.
10 The aircraft, departed from Christchurch, on schedule, at 21:32.

1d **2.38**

1 There is nothing to report here.
2 We are making a missed approach.
3 The whole crew has exceeded their statutory working hours.
4 The aircraft may have some slight damage to its radome.
5 We must decide whether to hold any longer or divert.
6 We have six sacks of mail in the hold.
7 There is a sea mist blowing in from the west.
8 Can you give me a list of alternates where we can divert?
9 I ate a big breakfast this morning at the hotel.
10 We have 164 nautical miles to destination.

4a **2.39**

1 We have lost most of our main instrument displays and are using our standby instruments.
2 There are some very unruly football fans in Economy and the flight attendants are having a lot of trouble containing them.
3 We have just extinguished a fire in the rear toilet. Can you please give us suitable alternates en route if we need to divert?
4 Reception is very poor on our present frequency. I am reading you two out of five.
5 The cabin crew have reported a suspicious individual who seemed to be taking his shoes apart under his seat.
6 There appears to be a slow leak from our green hydraulic system. We are monitoring the situation.
7 Mayday, Mayday, Mayday, Vladivostok Control, United 68. We have lost all four engines and are making an emergency descent. We hope to be able to relight at a lower altitude. Have you had any reports of volcanic ash?
8 We are picking up a lot of ice on our wings at this altitude. The wing anti-icing doesn't appear to be very effective. We are in IMC conditions.

4b **2.40**

1 Be advised that several flights have been reporting turbulent conditions at your present level.
2 Traffic restrictions in the Gdansk area have been extended until 14:20.
3 Unable to hand you over to Gander. Contact them on 128 decimal 450.
4 I believe you want to file an incident report. Can you give me any details?
5 We've just received an anonymous call saying that there is a bomb on board your flight.
6 I have a blind spot on my radar and will not pick you up again until Rimini.
7 The weather's getting worse here. The RVR on Runway 17 Right is down to 280 metres. What are your intentions?
8 Can you describe the aircraft you saw?

5a **2.41**

Stockholm Arlanda International Information Echo, weather at one three five five Zulu. Wind two one zero at eight, visibility five. Five hundred few, one thousand two hundred scattered, ceiling three thousand overcast. Temperature one five. Dew point eight. Altimeter 1009. IFR approach is runway one nine left. Departures, runway one niner right. Advise controller on initial contact.

5b **2.42**

We are in the London region. ATC advises Flystar 259, level at Flight Level 190, to expect further descent in ten miles as there is traffic below. Shortly afterwards, Flystar 259 declares that he's descending due to a TCAS Traffic Advisory. The controller was expecting a request for further descent from Flystar 259 and so interprets this call as a request. He is unaware that there is an airprox in his airspace.
Shamrock 148, at Flight Level 180 en route to Shannon, calls in to report a traffic conflict and both crews try to establish visual contact. Flystar 259 then advises the controller that they are clear of conflict and are climbing back to Flight Level 190.
What were the factors in the error chain which caused a serious incident?

6 **2.43**

1
ATCO: Descend Flight Level 130.
Pilot: We have trouble with descent.
2
ATCO: Report flight conditions.
Pilot: Difficult. Cloud thick. Thunderstorm.
3
ATCO: Will you require assistance on arrival?
Pilot: Affirm.
4
ATCO: Turn left heading 180.
Pilot: Unable.
5
ATCO: Pass your message.
Pilot: Communication poor ... New frequency.
6
ATCO: Say again the situation on board.
Pilot: Someone's banging on cockpit door ... attendant's afraid.
7
ATCO: Expect approach at time 18.
Pilot: Unable ... fuel low.
8
ATCO: Contact Approach 118 decimal 345.
Pilot: Contact Approach 118 decimal 325.
9
ATCO: What is the nature of your emergency?
Pilot: Two engines ... stopped. Dark in cockpit.
10
ATCO: Say again.
Pilot: Trouble in the cabin.

Unit 8

2b **3.01**

The A321 was en route from Spain to Norway with 216 passengers and 7 crew members. Weather conditions at the destination were forecast to include 4,000 metres visibility in snow, with temporary conditions of 1,200 metres visibility and 800 feet vertical visibility. The flight crew did not expect any problems related to the weather or runway conditions.
They expected the runway to be prepared to the usual acceptable standard during winter operations. The aircraft was about 40 minutes from the airport when snow began to accumulate on the active runway, Runway 18. The runway had an available landing distance of 2,569 metres and was 45 metres wide. Airport personnel decided to start clearing snow after the A321 landed.

3a **3.02**

During descent, the flight crew received data from the automatic terminal information service indicating that Runway 18 was dry and that the braking action was good. Reported visibility was 2,500 metres in light snow and the ceiling was at 500 feet. Winds were from 060 degrees at six knots.
When the crew established radio communication with the airport control tower, they were told that Runway 18 was contaminated by eight millimetres of wet snow and that the braking action was medium. A post-incident analysis of weather and runway conditions, however, indicated that braking action actually was poor and that 12 millimetres of snow should have been reported, as the snow was wet. This was the first time the crew became aware that the runway was contaminated by snow.
The First Officer was the pilot flying. The approach was stabilised until the aircraft reached a radio altitude of 250 feet. The aircraft was one dot high on the glide slope at 50 feet and touched down about 780 metres from the runway threshold at 140 knots; this was about 350 metres beyond the intended touchdown zone. The First Officer applied maximum reverse thrust after the main landing gear touched down. However, the crew perceived no braking action and suspected that the autobrake had failed. The commander took control of the aircraft about half-way down the runway. With about 800 metres of runway remaining, the commander engaged the parking brake

and declared an emergency that the aircraft was going off the runway. This resulted in increased deceleration and the aircraft stopped at the very end of the hard-surfaced runway with the nose wheel against a concrete localizer monitor antenna base. There were no injuries and the A321 received minor damage to the lower fuselage skin, and to the nose wheel rim and tyre. The crew shut down the engines and the commander ordered a non-emergency evacuation through the left forward cabin door.

5 **3.03**

1 The full length of the runway
2 The fire service
3 CAT three C
4 Localizer and glide slope
5 Runway 31 Left
6 Radar vectors to final approach
7 ILS Runway 21 Right approach
8 GNSS approach Runway 13
9 VOR-DME approach, Runway 03 Left
10 Lower level

8 **3.04**

1
ATCO: CSA Lines 245, turn right heading 255 to intercept Localizer Runway 24.
Pilot: Turn right heading 245, intercept Localizer Runway 24, CSA Lines 245.
2
ATCO: Speedbird 1872, you can expect direct Trujillo in about twenty miles.
Pilot: Trujillo direct, Speedbird 1872.
3
ATCO: Oscar Kilo Alpha 1478, maintain six thousand feet.
Pilot: Maintain six thousand feet, Oscar Kilo Alpha 1487.
4
ATCO: Silkair 496, traffic 10 o'clock, 11 miles, westbound.
Pilot: Traffic 11 o'clock, ten miles, westbound, Silkair 496.
5
ATCO: Foxtrot Alpha Bravo 159, turn right heading 080, contact Radar 118 decimal 825.
Pilot: Turn right heading 040, contacting Radar 108 decimal 825.
6
ATCO: Orient Eagle 359, cleared ILS approach Runway 26 Left.
Pilot: Cleared ILS approach 26 Left, Orient Eagle 559.
7
ATCO: Enkor 153, continue present heading to intercept Localizer 19 miles from touchdown.
Pilot: Continue present heading to intercept Localizer five miles from touchdown, Enkor 153.
8
ATCO: Cyprus 766, surface wind 160 degrees, one-zero knots, QNH 1031, QFE 1025.
Pilot: Wind 160 degrees, one-zero knots, QNH 1021, QFE 1025, Cyprus 766.

9a, b, d **3.05**

1 I am very concerned about our rate of descent.
2 I'm getting worried about whether we'll be able to hold much longer.
3 I'm afraid that we've lost radio contact with Air India 4581.
4 I thought that he read back *290* not *250*.
5 The Boeing 737 is gaining on the turboprop ahead.
6 I am puzzled by our altimeter reading. I thought we were higher than 4,000 feet.
7 I am concerned about the flights being diverted from Oslo.
8 Don't you think it's strange that they've instructed us to turn left? I thought there was terrain at more than 3,000 metres to the north-west.

12b **3.06**

The flight crew had prepared for an ILS approach to Runway 28, but that runway was closed for scheduled maintenance as the MD-83 neared Dublin Airport. The approach controller cleared the crew to conduct the VOR DME approach to Runway 34.
The MD-83 was about five nautical miles from the runway and at 1,900 feet when it began to deviate left of the final approach course. This deviation was due to the flight crew misidentifying the lights of a hotel as those of the runway approach lighting system on Runway 34.
The commander became puzzled by the absence of runway edge lights ahead. He radioed, 'Tower, confirm that you have ... all lights on three-four.' The tower controller, who had been distracted by communications with airport maintenance personnel, noticed that the aircraft was significantly off track and told the crew to 'turn right now, turn right ... You're not landing on the runway ... Climb to two thousand feet.' The aircraft was at an altitude of 580 feet when the co-pilot initiated the go-around.
After considering the wind, the flight crew accepted vectors and completed an ILS approach to Runway 16, landing without further incident.

17a **3.07**

1 Remind all incoming flights that Runway 29 Left is closed for scheduled maintenance. Runway 29 Right is the runway in use.
2 Doesn't that Boeing 737 look too high on final?
3 Airport Maintenance has reported ten millimetres of standing water on the far end of Runway 15 Left.
4 The A319, which is Number 2 on approach, seems to be gaining on the Saab 340, which is Number 1 on short final.
5 Notify the wind direction has changed from 110 degrees to 140 degrees.
6 The last aircraft to land on Runway 26 has not yet vacated the runway and is stopped past the final exit.
7 Dragonair 448 seems to be making an approach to Runway 31 Left and not the runway in use, 31 Right.
8 Runway 28 Left has been closed due to the ILS being out of order. All incoming flights are transferred to Runway 28 Right.
9 It looks like that Embraer's nose gear is not extended.
10 The new runway in use is 04 Right. Remind all incoming flights of the proximity of the factory chimneys at 230 feet, two miles out, offset 500 metres from the approach path.

22a, b **3.08**

1 Regional 259 is two miles from touchdown. An MD-83 has just entered the active runway.
2 Runway zero seven Right is blocked by an aircraft which has not vacated. Lufthansa 338 is on short final.
3 There has been a heavy-storm and there are patches of standing water towards the centre section of Runway 28 Left.
4 The last flight to land reported severe windshear half a mile from the threshold of Runway 15 Right with a sudden drop in airspeed of 20 knots.
5 Ryanair 3548 is approaching Runway 26 Left, but is cleared to land on Runway 26 Right.
6 Maintenance work is being conducted on the far end of Runway zero-four. As a result the landing distance available has been reduced by 300 metres to 2,710 metres.
7 Migratory bird movements have been reported in the vicinity of the approach path to Runway 23 Left.
8 BA 375, are you at your minimum approach speed?
9 There are ice patches and drifting snow along the entire length of Runway 28 Left.
10 Malaysian 428 is two miles from touchdown and appears to have an excessive sink rate.

23b **3.09**

1 Be advised that visibility has decreased to 400 metres.
2 There is a factory with a chimney of 148 feet situated one mile to the north-west of the flight path and two miles from the runway threshold.
3 Remember that there have been cases of pilots confusing the runway lights with nearby motorway and city lighting.
4 Pilots have been reporting poor braking action due to the contaminated state of the runway surface.
5 There is a high-tension power line reaching 180 feet, running across the approach flight path three miles out from the threshold.
6 A Beechcraft, which appears to have a radio failure, has strayed into the terminal area.
7 A line of hills rising to 2,300 feet is located five miles to the south-east of the approach path to Runway zero-nine.
8 The A320 which has just landed, reported very strong variable and gusting winds during the last three miles of the approach.

Unit 9

4a **3.10**

1 We seem to have a flap system failure.
2 The Captain's PFD and ND have just gone blank.
3 We have a low-oil-level caution message for Engine Number 3.
4 We had a fire warning from Engine Number 2 a few minutes ago. The engine has been shut down.
5 We have just lost AC buses 1, 2 and 3. The autothrottle has disconnected and the display units are in degraded mode. The strength of our radio communications is less than normal.
6 We smelt some odours a couple of minutes ago, compatible with electrical overheat, which seemed to come from the overhead panel.
7 Passing through 8,000 feet, we were subjected to a lightning strike and experienced some power transients. The autothrust disconnected and there were several indication oscillations.
8 The glide path has been fluctuating on both our displays and we have only got DME data on System 1. We had no outer marker indication.

5a, b **3.11**

1 If we lose that hydraulic system, we will not have auto-braking.
2 As the yaw damper has failed, we are experiencing a lot of Dutch roll and the passengers are uncomfortable.
3 In the event of cabin depressurisation the oxygen masks will drop down.
4 Since Engine Number 2 has been shut down, I am opening the cross feed valve.
5 The autopilot and autothrust have disconnected, so I will fly the approach manually.
6 We have lost one main electrical generation, therefore I am starting the APU.
7 There is a Captain-Probes warning, so my instruments are supplied by the standby probes.
8 We have a Gear-not-downlocked message. As a result, I am requesting a low pass.

6 **3.12** **Pilots**

1 We seem to have a flap system failure and are unable to extend the flaps for landing.
2 The Captain's PFD and ND have just gone blank.
3 We have a low-level-oil caution message for Engine Number 3. We have reduced power on Number 3 to flight idle and are monitoring the level. Oil pressure seems to be stable.
4 We had a fire warning from Engine Number 2 a few minutes ago. The engine has been shut down. We have no more signs of fire. We'll need a few minutes to make sure the situation is stabilised before making our approach.
5 Ten minutes ago the cabin crew reported a considerable amount of water on the floor of the forward galley above the main equipment centre. We are experiencing electrical problems. The strength of our radio communications is less than normal.
6 We smelt some odours a couple of minutes ago, compatible with electrical overheat, which seemed to come from the overhead panel. We have de-energised all non-essential circuits. We can no longer smell anything.
7 We experienced control problems with the autopilot engaged, so reverted to manual flight. Problems have gone, continuing manually.
8 Passing through 8,000 feet, we were subjected to a lightning strike and experienced some power transients. We need to return to land and request ILS to Runway 13 Left.
9 The glide path has been fluctuating on both our displays and we have only got DME data on System 1. We had no outer marker indication. We are making a missed approach.
10 We have just experienced a stick shaker warning and autopilot disconnect. We are conducting a go-around to review the situation.

7a **3.13** **ATCOs**

1 We have had a momentary power cut and we are showing nothing on our radar screens for the moment.
2 Be advised that the runway centreline lighting has just failed. The approach and runway edge lighting is still fully operational.
3 The glideslope is unserviceable.
4 I'll give you the present weather as the automated ATIS is not transmitting for the moment.
5 Do not be surprised if there are short breaks in the radio transmissions. There is a lot of interference at the moment.
6 Use the runway centreline lighting for rollout and take particular care when you vacate the runway; much of the runway edge lighting is obstructed by snow.
7 Airport maintenance are working on the Localizer antenna. You can make a visual approach to Runway 17 Right. It has a PAPI set at three degrees.
8 You are cleared for an ILS approach to Runway 29 Left. Be advised that the PAPIs are unserviceable.

8a **3.14**

1 This will be a surveillance radar approach to the runway in use.
2 Be advised of terrain rising to 2,800 feet near the approach path.
3 The ILS is operating in downgraded mode.
4 Visibility is decreasing quite rapidly.
5 Debris has been reported on Runway 29 Left.
6 There are several aircraft ahead of you on approach.
7 The far end of Runway 17 is contaminated with standing water.
8 If radio contact is lost and you are unable to continue this approach, climb to the minimum safe altitude.
9 There has been a power cut and some of the airport lighting and ground support is not available.
10 The wind velocity has changed since Information Golf.

9b **3.15**

Pilot: Bangkok Approach, Fedex 3479, there was a loud crashing noise during our descent and we had a sudden pitch-down moment. When the flight engineer went to investigate, he found that one of the cargo pallets on the main deck had come detached and had slid three or four metres. He has secured it temporarily, but we are trying to avoid any sudden manoeuvres. Request long straight-in approach, Fedex 3479.
ATCO: Fedex 3479, Bangkok Approach. Roger. Turn left heading 160. Intercept ILS Runway 19 Left. Are you familiar with the approach procedure?
Pilot: Affirm, Fedex 3479.
ATCO: Do you accept visual approach, Runway 19 Left, behind A330?
Pilot: Behind A330, Fedex 3479.
ATCO: Fedex 3479, cleared visual approach Runway 19 Left, maintain own separation from preceding A330.

10b **3.16**

1 Pan pan, pan pan, pan pan. London Control, this is Condor 493. We now have minimum fuel and 25 minutes' fuel endurance, request descent and priority landing, Condor 493.
2 We seem to be unable to extend our right-hand main gear. We wish to discontinue our approach and attempt to recycle the gears before making a new approach.
3 There were vibrations on Engine Number 2. However, the engine seems to be running smoothly now and we are continuing our climb. We suspect bird ingestion. You might advise departing aircraft.
4 The impact has caused a loss of cabin pressurisation. We have initiated an emergency descent, are passing through 17,000 feet and request clearance to a lower level.
5 The rear cabin crew have reported two agitated passengers who seem to be threatening the crew in the forward galley. There is someone banging on the cockpit door. I will update you on the situation.
6 We have a hydraulic problem, but all systems remain serviceable at the moment. We'll advise any change.
7 Mayday, Mayday, Mayday, Ankara Control, Etihad 4783. There is smoke coming from the overhead circuit breaker panel. Requesting emergency descent and diversion.
8 Dispatch has informed us of a phone call the airline has received warning of an explosive device in the passenger baggage. Requesting expedited descent and diversion to the nearest suitable airport.

13 **3.17**

On the 7th January 2008, a Boeing 747 was being operated on a scheduled international service between London, England and Bangkok, Thailand. The aircraft had 346 passengers and 19 crew on board.
At about 08:37 UTC, while the aircraft was at about 21,000 feet on descent to Bangkok International Airport, the customer service manager notified the flight crew that a substantial water leak had occurred in the forward galley. The customer service manager reported that the water was smelly and covered the entire galley floor. The cabin crew attempted to soak up the water using blankets; four or five blankets were saturated.
At 08:40, the flight crew noticed a bus-control-unit-status message. The message disappeared after a short time. Between 08:45 and 08:52, cockpit indications showed a number of other electrical bus and system failures: AC buses one, two and three were not powered; the autothrottle disconnected automatically; the autopilot disengaged automatically; the right displays blanked.
The status of AC bus four appeared normal. The flight crew reported main battery and auxiliary power unit battery discharge messages indicating that some systems were being powered by batteries. The crew reported that they also checked the cockpit circuit breakers, and none of them appeared to be open.
When the crew communicated with Air Traffic Control, the strength of the transmissions was less than normal. EPR indication was available only on the Number 4 engine. The cabin lights extinguished during approach.
The crew conducted an approach to Runway 01 Right in Visual Meteorological Conditions and the aircraft landed safely at 09:07.

14 **3.18**

1 The customer service manager notified the flight crew that a substantial water leak had occurred in the forward galley.
2 The customer service manager reported that the water was smelly.
3 The cabin crew said that four or five blankets were saturated.
4 The flight crew saw that the bus-control-unit-status message disappeared after a short time.
5 The pilots noticed that AC buses one, two and three were not powered.
6 The flight crew saw that the autothrottle disconnected automatically.
7 The status of AC bus four appeared normal.
8 The crew reported that they also checked the cockpit circuit breakers.
9 The crew observed that the strength of the transmissions was less than normal.
10 The passengers saw that the cabin lights extinguished during approach.

19a **3.19**

1 full
2 lift
3 dumper
4 lose
5 far
6 last
7 loss
8 way
9 warm
10 clean

22 **3.20**

1 The windshield cracked a few moments ago.
2 We made a go-around.
3 We have lost the pilot's PFD and ND displays.
4 We have donned our oxygen masks.
5 We have initiated an emergency descent.
6 We have extended the RAT.
7 We immediately retarded Engine Number 2 to flight idle.
8 We have started the APU.
9 We are recycling the landing gear.
10 We wish to make a precautionary landing.

23a **3.21**

Flight NZ 60, an Air New Zealand Boeing 767 aircraft with 165 passengers and 11 crew members on board was cleared to Faleolo via a Foxtrot Alpha Lima Echo arrival 15 nautical mile arc for the ILS runway zero-eight, using a low-drag approach profile.
From Foxtrot Alpha Lima Echo, the aircraft established on the 15-mile arc then captured the Localizer inbound course at 14 miles. About one second after APPROACH was armed, the auto-flight system captured the glide path. Approximately five seconds after glide-path capture, the rate of descent increased. Flight deck instruments confirmed the aircraft to be both on glideslope and on Localizer and the ILS was identifying correctly.
The pilot not-flying became aware that the visual cues did not correspond with what was expected.
Approximately six miles from the threshold a missed approach was carried out from an altitude of about 400 feet. The aircraft instruments indicated 'on glideslope' throughout the go-around until abeam the runway.

24a **3.22**

Analysis of Flight Data Recorder data revealed that at all positions within 40 degrees of the Localizer front course, the aircraft was receiving a zero glideslope deviation signal – the aircraft 'thought' it was on glideslope, but it had descended on a path of approximately 3.5 degrees to a point 5.5 nautical miles short of the runway.
It was found that the ILS glideslope transmitter had inadvertently been left in the bypass mode, with the unserviceable transmitter selected. This resulted in the glideslope transmitter monitor being unable to shut down the faulty transmitter or to transfer to the serviceable transmitter. The result was the transmission of invalid glideslope guidance information. The tower remote ILS transmission indicator was inoperative.
The crew of NZ 60 was well prepared and competent and executed their duties in accordance with company Standard Operating Procedures. Nothing in their experience had prepared them for the failures behind this event. It was most fortunate that, without discussion, the crew went straight from 'inquiry' to 'assertion' in less than ten seconds in executing the go-around.

Unit 10

2a **3.23**

When the Approach Controller detected the conflict, he instructed the Fokker 100 to immediately climb back to 5,000 feet. However, the TCAS triggered a 'Descend' RA just after the ATC instruction to climb. In compliance with the ICAO regulation, the pilot followed the RA and disregarded the opposite ATC instruction. Additionally, the VFR pilot initiated a climb and made a 90-degree turn that increased the horizontal separation. As a result, the aircraft passed at 0.9 nautical miles and 560 feet apart.
If the Fokker 100 pilot had followed the ATC instruction, it would have crossed the VFR aircraft trajectory and the vertical distance would have been less than 300 feet.

5a, b **3.24**

1
ATCO: Climb immediately.
Pilot: Unable, TCAS RA.
2
ATCO: Reduce speed to 130 knots.
Pilot: Unable. Our minimum approach speed is 140 knots.
3
ATCO: Report established on localizer.
Pilot: Unable. Our localizer is showing inoperative.
4
ATCO: Increase rate of descent.
Pilot: Unable. We have a hydraulic failure. The flight controls are responding slowly and we are having trouble stabilising.
5
ATCO: Cross Papa Echo Charlie Alpha at 52.
Pilot: Unable. We have had an engine flame-out and are in single-engine operation. Our airspeed is reduced by 30 knots.
6
ATCO: Orbit right for sequencing.
Pilot: My First Officer is incapacitated. I'd prefer a left circuit for greater visibility.
7
ATCO: Expect onward clearance at 35.
Pilot: We will have reached our minimum fuel at 30. Request priority landing.
8
ATCO: Cleared ILS approach Runway 28 Right.
Pilot: We will be making a flaps-up landing and will require longest landing distance available.

6 **3.25**

1 Has the foam carpet been deployed yet?
2 Have the fire fighters arrived at the runway?
3 Has the MD-90 vacated the runway yet?
4 Have you been able to re-establish the high-intensity runway lighting?
5 Has the runway braking action been measured?
6 Has the latest weather information been uploaded?
7 Have you been able to contact our company dispatch?
8 Has the snow been cleared from Runway 28 yet?
9 Have you been able to check the DME signal?
10 Has all the navaid software been updated?

7a, b **3.26**

1 Is the passenger still threatening the cabin crew?
2 Is the fuel still leaking from the fuel manifold?
3 Are you clear of conflicting traffic?
4 Are you still experiencing severe turbulence?
5 Is the left main gear still not extended?
6 Do you still have a generator overload message?
7 Have you got the situation under control?
8 Have you still got an engine flame-out?

8a, b **3.27**

Two aircraft level at Flight Level 70 are being radar vectored by the Approach Controller: an ATR72 is heading 185 degrees and a Boeing 737 is in the opposite direction heading 345 degrees.
A third aircraft (SW3) level at Flight Level 50 is heading east. All aircraft are in IMC. Because the controller is occupied with the resolution of another conflict, the Boeing 737 is instructed, late, to descend to Flight Level 60. Both aircraft are at the same level and are converging quickly. The TCAS II of each aircraft triggers a coordinated RA a few seconds later: the ATR72 pilot receives a 'Descend' RA that he follows; the Boeing 737 pilot receives a 'Climb' RA that he does not follow. He continues to comply with the ATC instruction.
The ATR72 pilot immediately informs the controller that he has a 'Descend' RA using the standard phraseology. However, just after, the controller repeats to the Boeing 737 the instruction to descend to Flight Level 60 for avoiding action.
The Boeing 737 pilot descends through Flight Level 60. The opposite reaction to his 'Climb' RA induces an 'Increase Descent' RA on board the ATR72, which leads the pilot to deviate much more than initially required by TCAS II. This large vertical deviation induces a new TCAS conflict with SW3 level at Flight Level 50.

10 **3.28**

1
ATCO: Malaysian 485, cleared to Sierra Bravo November, squawk 3164 with ident.
Pilot: Cleared to Sierra Bravo November, squawking 3184, Malaysian 845.
2
ATCO: Aeroflot 639, 7,000 feet not available due to VOR calibration in the Kungrad region, descend to 9,000 feet in 15 miles.
Pilot: Descending 9,000 feet, Aeroflot 639.
3
ATCO: Qatari 784, you're cleared to Jiddah via Zalim and Al Birkah, Flight Level 190.
Pilot: Cleared to Jiddah via Zalim and Mecca, Flight Level 190, Qatari 784.
4
ATCO: Transavia 685, turn right heading 180, contact Radar on 118.6.
Pilot: To the right heading 180, contact Radar 118.8, Transavia 685.
5
ATCO: Asiana 962, descend to altitude 3,000 feet, QNH 987 millibars, Information Kilo.
Pilot: Descend 3,000 feet, QNH 997 millibars, we have checked Information Kilo.
6
ATCO: Finnair 634, traffic restrictions in the Volkhov area have been extended until 17:30.
Pilot: Roger, traffic restrictions in the Volkhov area suspended till 17:30, Finnair 634.
7
ATCO: Austrian 275, maintain Flight Level 130, omit position reports until Bucharest.
Pilot: Flight Level 130, will omit position report at Bucharest, Austrian 275.
8
ATCO: Jordanian 359, the foam carpet begins 500 metres after the threshold; it's 15 metres wide and 700 metres long. Turn left heading 150. Report established on Localizer.
Pilot: Roger. Foam carpet 700 metres from threshold. Established 150, Jordanian 359.

12c **3.29**

1 Flying in haze creates the impression that the runway is farther away, inducing a tendency to make the glide path shallower and to land long.
2 In crosswind conditions, the runway lights and environment will be angled with the aircraft heading. Flight crew should maintain the drift correction and resist the tendency to align the aircraft heading with the runway centreline.
3 Rain on the windshield creates refraction and the perception of being too high, thus inducing a nose-down correction that places the aircraft below the desired flight path. In night-time conditions, rain increases the apparent brilliance of the approach lighting system, making the runway appear closer, inducing a pitch-down input and the risk of landing short of the runway threshold.
4 A wet runway does not reflect light, thus affecting depth perception by appearing to be farther away. This visual effect usually results in a late flare and in a firm touchdown.
5 A snow-covered terrain with clouds overcast creates a phenomenon called *whiteout*, that eliminates perception of terrain features and height above terrain.
6 When breaking out of the overcast at both ceiling and visibility minimums, the slant visibility may not allow sight of the farther bars of the VASI/PAPI, thus reducing the available clues for the visual segment in reduced visibility.

15b **3.30**

1 Have you repaired the fault?
2 Have you completed the Descent checklist?
3 Have you extinguished the fire?
4 Have you adjusted your rate of descent?
5 Have you reduced your speed?
6 Have you turned onto heading 310?
7 Have you cross-checked your instruments?
8 Have you inserted the new data?
9 Has the First Officer taken over the controls?
10 Have you turned on your landing lights?

17a **3.31**

Proceed outbound on track 098 degrees for CAT A or B and on track 109 degrees for CAT C, descending to 3,800 feet. At eight miles DME, commence base turn left to establish final approach track 265 degrees. At Final Approach Fix, descend to Minimum Descent Altitude to cross step-down fix 4.5 miles DME at 3,900 feet.

22a **3.32**

1 The previous aircraft reported irregular glide slope indications during final approach.
2 Hello, Nick, have you got anything unusual to report? How is the traffic flow at the moment?
3 Pilots have been reporting moderate windshear conditions during the last mile to touchdown.
4 Say again. The end of your transmission was completely garbled.
5 There will be a television camera crew here making a documentary for the next couple of hours. Try not to pay attention to them.
6 No aircraft is to fly within area bounded by circle radius six nautical miles centred at 5206653 North, 0043334 West, except aircraft flying with permission of coast guards.
7 Speedbird 987, descend to 3,000 feet. Speedbird 897, turn right heading 230
8 Delays are half an hour at the moment, but increasing.

26a, b **3.33**

1 Report runway in sight.
2 Confirm gear down and locked.
3 Cleared to land.
4 QNH 1015, number 3 in traffic.
5 This is a right-hand circuit for Runway 26.
6 When established on Localizer, descend on glide path, QNH 1009.
7 Have you restarted the engine?
8 An incoming B767 reported windshear at 800 feet, airspeed loss 20 knots.
9 Cleared straight-in ILS approach Runway 09, descend to altitude 3,000 feet, QNH 1003.
10 There are ice patches on Runway 21 and braking action is medium.

28a **3.34**

Part 1: The VOR radial signal starts fluctuating during the final approach, and the information finally disappears around 1,200 feet above ground level. It is quite dark outside. Without the VOR and in the absence of visual cues, what would be your next move?
Part 2: In the absence of any adequate visual cues and without the VOR, you decide to go around and to follow the standard missed-approach procedure. While in the hold after go-around, ATC confirms the VOR/DME is functioning correctly as far as they know. Following that confirmation, you decide to perform a navigation accuracy check. All indications are consistent except the automatic direction finder. The FMS shows you are on course. Only the Non-Directional Beacon (NDB) shows you off track, conflicting with the FMS and the VOR. The Navigation Display (ND) indicates there is a severe thunderstorm to your left. Based on the data you have, which position information would you trust – the VOR, FMS or the ADF?
Part 3: You consider the ADF indications on the ND as inconsistent with the rest of the data provided by the VOR, DME and EGPWS, and you decide to fly a second approach.
Again, the VOR information is fluctuating. When the aeroplane is more than six miles from the runway, the radio-altimeter automatic call-out suddenly announces: '1,000 feet' followed shortly by this auto alert: '400 feet'. You are surprised by these two alerts, which occur much too early. And then you lose the VOR signal again. Based upon those call-outs and without the VOR signal, what would your next move be?
Part 4: You immediately decide to abort the approach again and to divert to the alternate airport. As the go-around is initiated, the EGPWS 'too low terrain' alert sounds. What would your response to this warning be?
Part 5: Since you are already going around, you disregard the message and continue the flight to the alternate airport, where you land uneventfully with a normal VOR/DME approach.
When returning to the original airport the day after, you perform a VOR/DME approach in daylight VMC. You notice an error in the VOR signal of 30 degrees because of the visual reference available. What action would you perform to inform the local authorities?
Part 6: You decide to fill out an Air Safety Report.

Review C

1a, b **3.35**

1 Climb to 5,000 feet immediately.
2 We have an armed man on board.
3 Turn left heading 230 degrees.
4 We are unable to climb at this time.
5 RVR has decreased to 350 metres and the ceiling is at 300 feet.
6 There seems to be a vehicle crossing the active runway.
7 We are not sure that our nose gear has extended correctly.
8 There have been several reports of windshear half a mile from touchdown.
9 Go around, I say go around. Traffic on 34 Right.
10 We have a severely concussed passenger on board and need to divert.

1c **3.36**

1 There are two men walking on the taxiway.
2 We will be flying against a strong headwind on the way back.
3 Can you watch the screen a moment?
4 I'm not sure when we'll be ready.
5 The runway's still very wet – braking action is only medium.
6 We had a Pan Pan call from Air Slovakia at 14:15.
7 The mist is clearing quite quickly.
8 We need the frequency to be quiet in an emergency.
9 There is an old Fokker Friendship ahead of us on final.
10 What's the height of the factory chimney to the left of the flight path?
11 We have enough fuel to divert to Anchorage. Thanks a lot for recalculating it.
12 We are just past Port Moresby heading 290 degrees at Flight Level 180.

1d **3.37**

1 working walking 2 again against 3 watch wash 4 we'll well 5 wet wait 6 has had 7 clearing cleaning 8 quiet quite 9 hold old 10 high height 11 tanks thanks 12 fast past

2a **3.38**

1 The braking action on the runway in use is good.
2 I am returning to land.
3 We have a full flight.
4 We expect to be crossing Bratislava soon.
5 We have a large fuel reserve.
6 We have a problem in the flight deck.
7 We were told to expect delays.
8 Expect delaying action in 20 miles.
9 Reduce your speed now.
10 Expect higher in 15 miles.
11 One of the runways is closed.
12 Your ETA has been changed.
13 Someone will meet your sick passenger at the gate.
14 We need more time to prepare our descent.
15 We have lost some of our automation.

3b **3.39**

1 We have just encountered a very severe hailstorm descending through 9,000 feet. The First Officer's visibility is very restricted and we'll need to reduce speed.
2 I am no longer able to distinguish Lufthansa 3472, Air China 2895 and Adria 385 on my screen; they're too close together.
3 Your last message was garbled and I have the impression that there was another transmission interfering. Pass your message again.
4 If you need to dump ten tonnes of fuel, I'll give you vectors to fly over the forest.
5 Are you unable to dim the lights? They are causing a lot of glare.
6 I just can't transmit any longer on 118.650 and I'm no longer receiving any transmissions apart from a low whistling sound.
7 Be advised that our landing speed will be high and that we'll be taking up more of the runway.
8 Pan pan, pan pan, pan pan, Dallas Control, Delta 817. We will need to make a precautionary landing.

4a **3.40**

1 Belarus Avia 497, cleared to enter standard holding pattern over Manchester, Flight Level 070. Expect up to 40 minutes' delay due deteriorating weather conditions.
2 COPA 5712, all traffic diverted to San Salvador. The runway is closed after a runway excursion and recovery work is in process.
3 China Eastern 4558, cleared for an ILS approach Runway 08 Left.
4 Iberia 3095, be advised that the Localizer is not available due scheduled maintenance.
5 Kuwaiti 596, cleared for a circling approach to capture the ILS to Runway 16 Left.
6 Varig 221, cleared to enter standard holding pattern over Madrid, Flight Level 090. Expect approximately 30 minutes' delay due heavy traffic.

5 **3.41**

Tower: Etihad 339 Heavy, Abu Dhabi Tower, Runway 19 Left, cleared to land.
Pilot: Cleared to land, 19 Left, Etihad 339 Heavy.
Tower: Winds 170 degrees at three knots.
Pilot: Copy 170 / 3. I've got the right engine shut down and everything appears to be OK from the inside here. When we've come to a standstill, we'd appreciate it if you could take a look at the right-hand engine.
Tower: We have the request and we're planning on that.

Pilot: Thank you.
Tower: Etihad 339 Heavy, your right engine is still on fire.
Pilot: Thank you. We're going to stop once we've vacated the runway and hold. If they could, please put it out?
Tower: The fire service is on the runway now.
Pilot: Tower, Etihad 339, are you with me?
Tower: Etihad 339 Heavy, go ahead.
Pilot: Is the fire service on the same frequency?
Tower: They're on Ground frequency.
Pilot: OK, what is that?
Tower: Contact them on 121.75.
Pilot: OK. Etihad 339 here, Fire Service, are you there?
Fire Service: I'm here, go ahead.
Pilot: How does that engine look?
Fire Service: We're putting foam on it now. It appears like it was in the tail pipe, but I'm going to spray the whole engine.
Pilot: OK. No need to evacuate the passengers, is that correct?
Fire Service: Negative, not at this time. Give me a minute or two... Confirm you have that engine shut down.
Pilot: Yes, it's shut down. It's been off for a little while. The Number 1 engine is still running.
Fire Service: I understand that. Hopefully you can turn it down to just a slow speed.
Pilot: It's at idle.
Fire Service: We're having a hard time putting this out. Have you fired your bottle?
Pilot: Both bottles have been discharged ... How does it look?
Fire Service: It looks like we're almost there. We're just going to make a mess out here.
Pilot: Well, that's OK.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

AAL Above Airfield Level
A.C. alternating current
a/c aircraft
ACARS Aircraft Communications Addressing and Reporting System
ACC Area Control Centre
ADF Automatic Direction Finder
AFIS Aerodrome Flight Information Service
AGNIS Azimuth Guidance for Nose-In Stand
ALAR Approach and Landing Accident Reduction
amsl above mean sea level
APP Approach
APU Auxiliary Power Unit
ASAP as soon as possible
ASI Air Speed Indicator
ATA Actual Time of Arrival
ATC Air Traffic Control
ATCO Air Traffic Control Officer
ATD Actual Time of Departure
ATIS Automatic Terminal Information Service
BC Patches, banks (*bancs*)
BKN Broken
BR Mist (*brume*)
CAT III Category 3 (ILS)
CAVOK Ceiling And Visibility OK
CFIT Controlled Flight Into Terrain
CRM Crew Resource Management
CRS Course
CVR Cockpit Voice Recorder
DH Decision Height
DME Distance Measuring Equipment
DU Dust; Display Unit
DZ Drizzle
EFIS Electronic Flight Instrument System
EGPWS Enhanced Ground Proximity Warning System
EGT Exhaust Gas Temperature
elev elevation
ER Extended Range
ETA Estimated Time of Arrival
ETD Estimated Time of Departure
ETOPS Extended Twin Operations
FAF Final Approach Fix
FIR Flight Information Region
FL Flight Level
F/O First Officer
FOD Foreign Object Damage
fpm feet per minute
ft feet
FU Smoke (*fumée*)
FZ Freezing
G Gusting
GPU Ground Power Unit
GPWS Ground Proximity Warning System
GR Hail (*grêle*)
G/S Glideslope
HDG Heading
HP High Pressure
hPa hectoPascal
HZ Haze
IAF Initial Approach Fix
IAP Instrument Approach Procedure
IAS Indicated Air Speed
IC Ice Crystals
IDG Integrated Drive Generator
IFR Instrument Flight Rules
ILS Instrument Landing System
IMC Instrument Meteorological Conditions
in.Hg inches of Mercury
INS Inertial Navigation System
kt(s) knots
LDA Landing Distance Available
LH Left-Hand
LLZ Localizer
LOC Localizer; Locator
LOFT Line Oriented Flight Training
LP Low Pressure
LT Local Time
m metres
MAP Missed Approach Point
mb millibars
MCDU Multipurpose Control and Display Unit
MDA Minimum Descent Altitude
METAR Aviation Routine Weather Report
MLG Main Landing Gear
MSA Minimum Safe Altitude
N1 Engine LP compressor speed
N2 Engine HP compressor speed
ND Navigation Display
NDB Non-Directional Beacon
NLG Nose Landing Gear
nm/NM nautical miles
NOSIG No significant change expected in next two hours
NOTAM Notice for Airmen
OAT Outside Air Temperature
OM Outer Marker
OVC Overcast
P More than (METAR)
PAPI Precision Approach Path Indicator
PF Pilot Flying
PFD Primary Flight Display
PIREP Pilot Report
PNF Pilot Not Flying
psi pounds per square inch
QFE altimeter setting for aerodrome level
QFU magnetic orientation of runway
QNH altimeter setting amsl
RA Rain; Resolution Advisory; Radio Altimeter
RH Right-Hand
RMP Radio Management Panel
RNAV Area Navigation
RT/RTF Radiotelephony
RVR Runway Visual Range
RVSM Reduced Vertical Separation Minima
RWY Runway
SCT Scattered
SH Showers
SID Standard Instrument Departure
SN Snow
SQ Squall
SS Sandstorm
SSR Secondary Surveillance Radar
STAR Standard Terminal Arrival Route
TA Transition Altitude; Traffic Advisory
TAF Terminal Aerodrome Forecast
TCAS Traffic Alert and Collision Avoidance System
TDZ Touchdown Zone
TMA Terminal Control Area
T/O Take-off
TS Thunderstorm
TWR Tower
TWY Taxiway
U/S Unserviceable
UTC Coordinated Universal Time
VA Volcanic Ash
VASI Visual Approach Slope Indicator
VFR Visual Flight Rules
VMC Visual Meteorological Conditions
V1 decision speed
VOR VHF Omnidirectional Range
VRef Reference velocity
VSI Vertical Speed Indicator
Z Coordinated Universal Time

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