Issue 3 , September 2016

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AVIATION SAFETY BULLETIN

A Publication of:

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Inside this Issue:

FOREIGN OBJECT DEBRIS AND DAMAGE PREVENTION

Figure 1. No FOD

Overview

Foreign object debris (FOD) at airports can cause damage that costs airlines, airports, and airport tenants millions of dollars every year. FOD is any object that does not belong in or near aircraft and, as a result, can injure airport or airline personnel and damage aircraft. A FOD-prevention program of training, facility inspection, maintenance, and coordination between all affected parties can minimize FOD and its effects.

Introduction

Foreign object debris (FOD) at airports includes any object found in an inappropriate location that as a result of being in that location can damage equipment or injure aircraft or airport personnel. The resulting damage is estimated to cost the aerospace industry $4 billion a year. Airports, airlines, and airport tenants can reduce this cost by taking steps to prevent airport FOD. FOD includes a wide range of material, including loose hardware, pavement fragments, catering supplies, building materials, rocks, sand, pieces of luggage, torches, screws, fuel dip sticks, grease rags and even wildlife. FOD is found at terminal gates, cargo aprons, taxiways, runways, and run-up pads. It causes damage through direct contact with aircraft, such as puncturing aircraft tires or ingestion into engines or as a result of being thrown by jet blast and damaging aircraft or injuring people.

Figure 2. FOD items collected at Nadi International Airport; grease rag, fuel dip stick, torch, screws, an airline garbage bag, rubber plug and a hose clamp.

Control Measures

A program to control airport FOD is most effective when it addresses four main areas:

1. Training,
2. Inspection by airline, airport, and aircraft handling agency personnel,
3. Maintenance
4. Coordination.

Training

Figure 3. Airport Tenant and Stakeholders Training

All airport and airline personnel and airport tenants should undergo training in the identification and elimination of FOD, including the potential consequences of ignoring it. This training can supplement the general FOD awareness incorporated into the airside driver-training curriculum at many airports. FOD training for flight crew includes following the recommended procedures identified in the Flight Crew Operating Manual and pre- and post flight inspection procedures covered during line training.

Effective training should stress safety to personnel and passengers, the hazards to equipment, the direct costs associated with FOD damage, and the indirect costs associated with flight delays and rescheduling. It should also include procedures for removing and eliminating FOD at its source, and should be reinforced through the use of posters and signs. Recurrent training is necessary to help maintain an awareness of FOD.

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FOREIGN OBJECT DEBRIS AND DAMAGE PREVENTION cont...

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Inspection

Figure 4. Airport Tenant and Stakeholders FOD Walk

Airline personnel and airport tenants, when feasible, should join the airport staff in daily airside inspections. This practice helps increase familiarity with local airfield conditions, and promotes effective communication between the airport and airlines.

The Civil Aviation Authority of Fiji (CAAF) requires that a daily, daylight inspection of aircraft manoeuvring areas and removal of FOD. In addition to performing these inspections at the beginning of the day or shift, personnel on the airside should look for FOD during their normal shifts.

Ongoing construction requires more frequent inspections. It may even be necessary to assign dedicated personnel to continually inspect for FOD during major construction activities. Flight crews should report to air traffic control and station operations any FOD they observe on runways and taxiways. Airlines and aircraft handling agents should designate individuals to inspect gate areas prior to aircraft movement to and from the gate.

MAINTENANCE or PROACTIVE MEASURES

Maintaining control of FOD includes using several methods:

- Sweeping.
- Magnetic bars.
- Rumble strips.
- FOD containers.

Sweeping

Sweeping may be done manually or with the airfield sweeper, which is the most effective equipment for removing FOD from

Figure 5. FOD Sweeper

airside. The sweeper removes debris from cracks and pavement joints, and should be used in all areas except for those that can be reached only with a hand broom. All airside areas, including aircraft manoeuvring areas, aprons and gates and the areas adjacent to them, should be swept routinely. The areas in which ground support equipment is staged should be swept periodically.

Magnetic bars

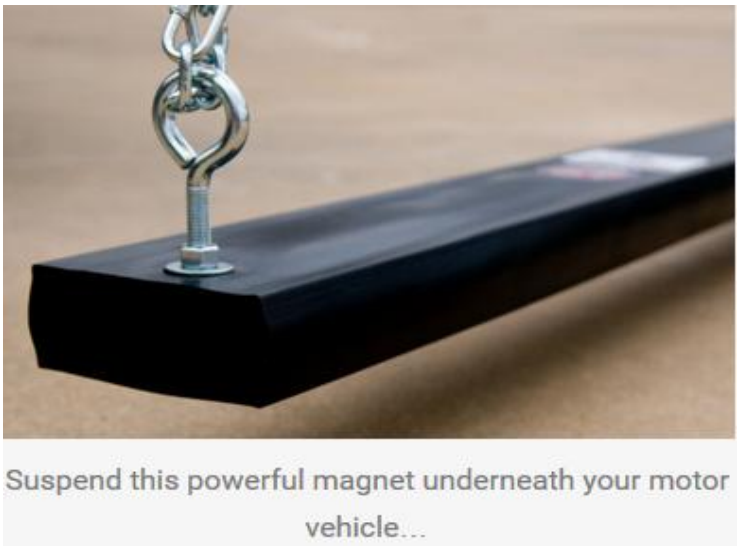

Figure 6. Magnetic Bars

These bars can be suspended beneath tugs and trucks to pick up metallic material. However, the bars should be cleaned regularly to prevent them from dropping the collected debris. Vehicles operating on the airside should be inspected periodically to ensure that they have no loose items that can fall off.

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FOREIGN OBJECT DEBRIS AND DAMAGE PREVENTION cont...

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Rumble strips

Figure 7. Rumble Strips

Driving over rumble strips dislodges FOD from vehicle undercarriages. The strips, which are 10 to 15 ft long, can be moved and used at transitions from the landside to the airside, or adjacent to airside construction areas.

FOD containers

Figure 8: FOD Containers/Bins

These containers should be placed at all gates for the collection of debris. The containers should be emptied frequently to prevent them from overflowing and becoming a source of FOD themselves. In addition, airport personnel can wear waist pouches to collect debris. Evaluating the debris collected in containers and pouches can reveal its sources and indicate where personnel and equipment should be deployed for more effective control.

Other means for preventing FOD damage include wind barriers and netting to restrict the movement of airborne FOD, fencing to prevent animals from entering the airfield, and well-maintained paved surfaces. If damaged pavement cannot be repaired immediately, aircraft should take an alternate route.

COORDINATION

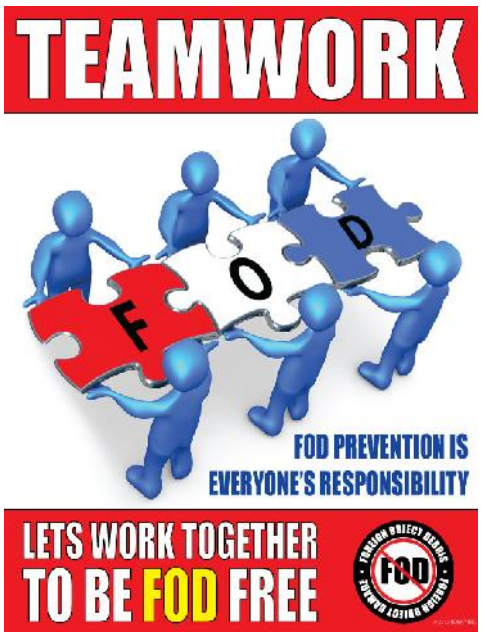
Airports with a FOD committee of airport tenant representatives tend to control FOD more successfully than those without such a committee because the representatives can address local conditions and specific problems and to coordinate FOD control efforts among themselves.

Both airside and landside construction activities, as well as scheduled maintenance, should be communicated to airport users as early as possible. Airport preconstruction planning should include a means for controlling and containing FOD generated by the construction. This is especially true in high-wind environments where debris is more likely to become airborne. Access to and from construction sites should avoid areas of aircraft operation. Contractors must fully understand the requirements and penalties incorporated in their contracts regarding the control and removal of FOD.

The ***CAAF SD-AD Advisory Circular, Appendix 15,*** **Operational Safety during Works on Aerodrome,** provides excellent guidelines for coordinating day-to-day FOD prevention during construction.

SUMMARY

An effective debris-control program greatly reduces the high cost of FOD damage and the potential for injury to personnel. The program is founded on initial and recurring training, and it is carried out through the inspection and maintenance of airport facilities. FOD control is most effective when all affected parties **"coordinate"** their efforts. ■

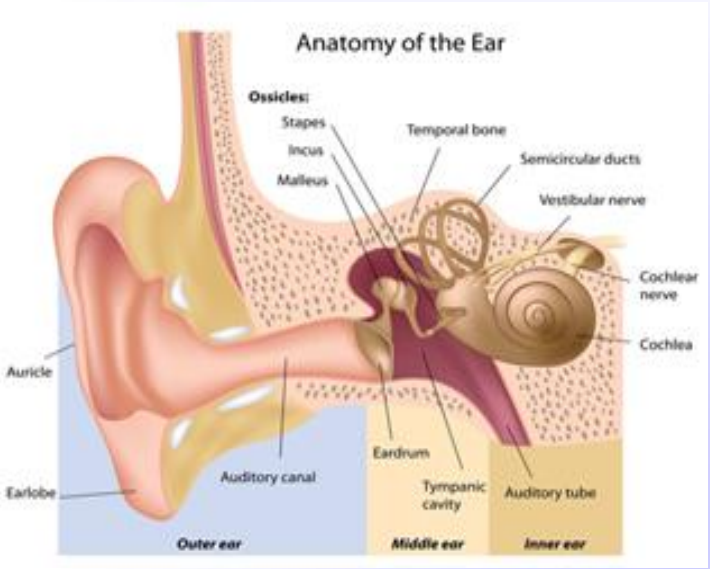


(Article uplifted by GSD)

HEARING AND NOISE IN AVIATION

Hearing

The term *hearing* describes the process, function, or power of perceiving sound. Hearing is second only to vision as a physiological sensory mechanism to obtain critical information during the operation of an aircraft. The sense of hearing makes it possible to perceive, process, and identify among the myriad of sounds from the surrounding environment.



Anatomy and Physiology of the Auditory System

The auditory system consists of the external ear, ear canal, eardrum, auditory ossicles, cochlea (which resembles a snail shell and is filled with fluid), and the auditory nerve.

Ambient sound waves are collected by the external ear, conducted through the ear canal, and cause the eardrum to vibrate. Eardrum vibration is mechanically transmitted to the ossicles, which, in turn, produce vibration of a flexible window in the cochlea. This vibration causes a pressure wave in the fluid located inside the cochlea, moving thousands of hair-like sensory receptors lining the inner walls of the cochlea. The movement of these receptors resembles the gentle movement of a crop field caused by the wind. The stimulation of these sensors produces an electrical signal that is transmitted to the brain by the auditory nerve. This signal is then processed by the brain and identified as a particular type of sound.

SOUND

The term *sound* is used to describe the mechanical radiant energy that is transmitted by longitudinal pressure waves in a medium (solid, liquid, or gas). Sound waves are variations in air pressures above and below the ambient pressure. From a more practical point of view, this term describes the sensation perceived by the sense of hearing. All sounds have three distinctive variables: frequency, intensity, and duration.

Frequency

This is the physical property of sound that gives it a pitch. Since sound energy propagates in a wave-form, it can be measured in terms of wave oscillations or wave cycles per second, known as hertz (Hz). Sounds that are audible to the human ear fall in the frequency range of about 20-20,000 Hz, and the highest sensitivity is between 500 and 4,000 Hz. Sounds below 20 Hz and above 20,000 Hz cannot be perceived by the human ear. Normal conversation takes place in the frequency range from 500 to 3,000 Hz.

Intensity

The correlation between sound intensity and loudness. The decibel (dB) is the unit used to measure sound intensity. The range of normal hearing sensitivity of the human ear is between -10 to +25 dB. Sounds below -10dB are generally imperceptible. A pilot who cannot hear a sound unless its intensity is higher than 25 dB (at any frequency) is already experiencing hearing loss.

Duration

Determines the quality of the perception and discrimination of a sound, as well as the potential risk of hearing impairment when exposed to high intensity sounds. The adverse consequences of a short-duration exposure to a loud sound can be as bad as a long-duration exposure to a less intense sound. Therefore, the potential for causing hearing damage is determined not only by the duration of a sound but also by its intensity.

NOISE

The term *noise* refers to a sound, especially one which lacks agreeable musical quality, is noticeably unpleasant, or is too loud. In other words, noise is any unwanted or annoying sound. Categorizing a sound as noise can be very subjective. For example, loud rock music can be described as an enjoyable sound by some (usually teenagers), and at the same time described as noise by others (usually adults).

Sources of Noise in Aviation

The aviation environment is characterized by multiple sources of noise, both on the ground and in the air. Exposure of pilots to noise became an issue following the introduction of the first powered aircraft by the Wright Brothers, and has been a prevalent problem ever since.

Noise is produced by aircraft equipment powerplants, transmission systems, jet efflux, propellers, rotors, hydraulic and electrical actuators, cabin conditioning and pressurization systems, cockpit advisory and alert systems, communications equipment, etc.

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HEARING AND NOISE IN AVIATION cont...

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Noise can also be caused by the aerodynamic interaction between ambient air (boundary layer) and the surface of the aircraft fuselage, wings, control surfaces, and landing gear. These auditory inputs allow pilots to assess and monitor the operational status of their aircraft. All pilots know the sounds of a normal-functioning aircraft.

On the other hand, unexpected sounds or the lack of them, may alert pilots to possible malfunctions, failures, or hazards. Every pilot has experienced a cockpit or cabin environment that was so loud that it was necessary to shout to be heard. These sounds not only make the work environment more stressful but can, over time, cause permanent hearing impairment. However, it is also important to remember that individual exposure to noise is a common occurrence away from the aviation working environment—at home or work, on the road, and in public areas. The effects of pre-flight exposure to noise can adversely affect pilot in-flight performance.

Sources of Sound/Noise

SOURCES	LEVEL (dB)
Whispered Voice	20-30
Urban Home, Average Office	40-60
Averag Male Conversation	60-65
Noisy Office, Low Traffic Street	60-80
Jet Transports (Cabin)	60-88
Small Single Plane (Cockpit)	70-90
Public Address (PA) Systems	90-100
Busy City Street	80-100
Single Rotor Helicopter (Cockpit)	80-102
Power Lawn Mower, Chain Saw	100-110
Snowmobile, Thunder	110-120
Rock Concert	115-120
Jet Engine (Proximity)	130-160

Types of Noise

Steady

Continuous noise of sudden or gradual onset and long duration (more than 1 second). Examples: aircraft powerplant noise, propeller noise, and pressurization system noise. According to the Occupational Safety and Health Administration (OSHA), the maximum permissible continuous exposure level to steady noise in a working environment is 90 dB for 8 hours.

Impulse/blast

Noise pulses of sudden onset and brief duration (less than 1 second) that usually exceed an intensity of 140dB. Examples: firing a handgun, detonating a firecracker, backfiring of a piston engine, high-volume squelching of radio equipment, and a sonic boom caused by breaking the sound barrier. The eardrum may be ruptured by intense levels (140dB) of impulse/blast noise.

EFFECTS OF NOISE EXPOSURE

Physiologic

Ear discomfort: May occur during exposure to a 120 dB noise.

Ear pain: May occur during exposure to a 130 dB noise.

Eardrum rupture: May occur during exposure to a 140 dB) noise.

Temporary hearing impairment. Unprotected exposure to loud, steady noise over 90 dB for a short time, even several hours, may cause hearing impairment. This effect is usually temporary and hearing returns to normal within several hours following cessation of the noise exposure.

Permanent hearing impairment: Unprotected exposure to loud noise (higher than 90dB) for eight or more hours per day for several years, may cause a permanent hearing loss. Permanent hearing impairment occurs initially in the vicinity of 4,000 Hz (outside the conversational range) and can go unnoticed by the individual for some time. It is also important to remember that hearing sensitivity normally decreases as a function of age at frequencies from 1,000 to 6,000 Hz, beginning around age 30.

Psychologic

Subjective effects: Annoying high-intensity noise can cause distraction, fatigue, irritability, startle responses, sudden awakening and poor sleep quality, loss of appetite, headache, vertigo, nausea, and impair concentration and memory.

Speech interference Loud noise can interfere with or mask normal speech, making it difficult to understand.

Performance Noise is a distraction and can increase the number of errors in any given task. Tasks that require vigilance, concentration, calculations, and making judgments about time can be adversely affected by exposure to loud noise higher than 90 dB.

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HEARING AND NOISE IN AVIATION cont...

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HOW TO PROTECT YOUR HEARING

Limiting duration of exposure to noise. OSHA- established permissible noise exposure limits for the workplace (including the cockpit of an aircraft):

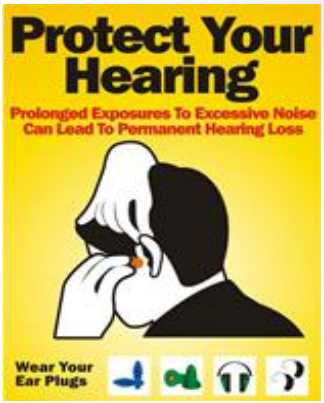
Noise Exposure Level Limits

Noise Intensity (dB)	Exposure Limit (hrs per day)
90	8
92	6
95	4
97	3
100	2
102	1.5
105	1
110	0.5
115	0.25

Use Hearing Protection Equipment

If the ambient noise level exceeds OSHA's permissible noise exposure limits, you should use hearing protection devices—earplugs, earmuffs, communication headsets, or active noise reduction headsets. Even if an individual already has some level of permanent hearing loss, using hearing protection equipment should prevent further hearing damage. These protection devices attenuate noise waves before they reach the eardrum, and most of them are effective at reducing high-frequency noise levels above 1,000 Hz.

It is very important to emphasize that the use of these devices does not interfere with speech communications during flight because they reduce high-frequency background noise, making speech signals clearer and more comprehensible.



Earplugs

Insertable-type earplugs offer a very popular, inexpensive, effective, and comfortable approach to provide hearing protection. To be effective, earplugs must be inserted properly to create an air-tight seal in the ear canal. The wax-impregnated moldable polyurethane earplugs provide an effective universal fit for all users and provide 30 to 35 dB of noise protection across all frequency bands.

Communication headsets

In general, headsets provide the same level of noise attenuation as earmuffs, and are also more easily donned and removed that earplugs, but the microphone can interfere with the donning of an oxygen mask.

Active noise reduction headsets

This type of headset uses active noise reduction technology that allows the manipulation of sound and signal waves to reduce noise, improve signal-to-noise ratios, and enhance sound quality. Active noise reduction provides effective protection against low-frequency noise. The electronic coupling of a low- frequency noise wave with its exact mirror image cancels this noise.

Combinations of protection devices

The combination of earplugs with earmuffs or communication headsets is recommended when ambient noise levels are above 115dB. Earplugs, combined with active noise reduction headsets, provide the maximum level of individual hearing protection that can be achieved with current technology.

SUMMARY

Hearing is second only to vision as a sensory mechanism to obtain critical information during the operation of an aircraft.

All sounds have three distinctive variables: frequency, intensity, and duration.

Normal conversation takes place in the frequency range from 500 to 3,000 Hz.

Daily exposure to noise levels higher than 90dB can cause hearing impairment. This can go unnoticed initially because it occurs in the vicinity of 4,000 Hz (outside the conversational range).

If the ambient noise level reaches 90dBA, you must use hearing protection equipment to prevent hearing impairment.

Exposure to loud noise before flying (at home, while driving, at a party, etc.) can be as harmful as exposure to aircraft noise. ■

(Source: Medical Fact for Pilots, FAA Civil Aerospace MIAED)

DELTA INTRODUCES INNOVATIVE BAGGAGE TRACKING PROCESS

Delta is deploying Radio Frequency Identification (RFID) baggage tracking technology, a first for U.S. carriers, providing customers with improved real-time tracking of luggage throughout the travel experience.

This move marks a historic shift for Delta and the 120 million bags it handles annually. RFID will replace barcode hand scanning – the industry standard since the early 90s. With this new technology, scanners use radio waves to capture highly accurate and consistent data stored on an RFID chip embedded in the luggage tag, driving superior tracking and increased transparency.

With RFID, customers will see their bags on and off the aircraft during their journey via push notifications to the Fly Delta mobile app beginning in the fourth quarter of 2016.

"With a $50 million investment in RFID at 344 stations around the globe, we aim to reliably deliver every bag on every flight," said Bill Lentsch, Delta's Senior Vice President – Airport Customer Service and Cargo Operations. "This innovative application of technology gives us greater data and more precise information throughout the bag's journey."

Initial deployments of RFID integrated throughout the baggage process show that bags are tracked at a 99.9 percent success rate, ensuring proper routing and loading.

For Customers: RFID means much more than just consistent baggage handling.

"In the same way that customers want information at their fingertips about flight changes, we know our customers want clear visibility to their checked bags," said Tim Mapes, Delta's Chief Marketing Officer. "Delta's industry-first baggage tracking app was a good first step. RFID will allow us to set a new standard for more transparent, interactive tracking on the Fly Delta mobile app."

Delta teams have deployed 4,600 scanners, installed 3,800 RFID bag tag printers and integrated 600 pier and claim readers to enable hands-free scanning of baggage throughout the handling process. RFID will soon track bags on all Delta mainline and Delta Connection flights.

Spread throughout 84 of Delta's largest stations, 1,500 belt loaders will give baggage the green light – literally – as it enters and exits the belly of a plane. The belt loader sensor will flash green when the bag is being loaded on the correct aircraft or red when the bag requires additional handling.

Today when a customer misses his or her connection, agents on the ground manually scan each bag to find the customer's luggage and ensure it is retagged for the new flight. With RFID scanners, agents have the ability to take inventory quickly or pinpoint a single bag.

"We've put every part of our process for baggage handling under the microscope and evolved it to the point of industry-leading performance," Lentsch said. "RFID will give Delta people a great tool to further widen the gap between us and our competitors".

Better baggage handling processes and enhanced technology have already shrunk the airline's mishandled bag rates by 68 percent over the past 10 years, establishing Delta as the leading U.S.-based global airline for baggage performance. In 2015 Delta led U.S. global airlines in DOT bag performance while setting six monthly DOT records and a full year record. ■

(Article uplifted by AVSEC—Source: CJ Consulting Group Singapore)

OPERATIONAL OVERVIEW (2015)-AIR SAFETY DEPARTMENT

HARMONISATION OF ANR PARTS

PART 19	Certification of Supply Organisations
PART 21	Certification of Products and Parts
PART 26	Additional Airworthiness Requirements
PART 39	Airworthiness Directives
PART 43	General Maintenance Regulations
PART 47	Registration of Aircraft
PART 61	Pilot Licences, Approvals, Certificates and Ratings
PART 66	Aircraft Maintenance Engineer Licensing
PART 67	Medical Standards, Tests and Certification
PART 91	General Operating and Flight Regulations
PART 92	Carriage of Dangerous Goods
PART 101	Gyrogliders, Parasails, Balloons, Kites, Rockets and Model Aircraft
PART 102	Remotely Piloted Aircraft Systems
PART 103	Microlight Aircraft
PART 105	Parachutes
PART 119	Air Operator – Certification
PART 121	Air Transport Operations – Large Aeroplanes
PART 125	Air Transport Operations – Medium Aeroplanes
PART 129	Foreign Air Transport Operator – Certification and Operations
PART 133	Helicopter Operations – Air Transport and Aerial Work
PART 135	Air Transport Operations – Small Aeroplanes
PART 137	Agricultural Aircraft Operations
PART 141	Aviation Training Institutions – Certification
PART 145	Aircraft Maintenance Organisations – Certification and Operation
PART 149	Aviation Recreation Organisations – Certification

AUDITS AND INSPECTIONS

	TOTAL 2014	TOTAL 2015	VARIANCE
Audits & Inspections	208	109	(⇩18)

CERTIFICATION, AUTHORISATION AND APPROVAL

	TOTAL 2015	COMMENTS
Aircraft on Fiji Register	84	*62 of these aircraft had valid Certificate of Airworthiness*
Air Operator Certificate	23	*9 of these certificates were foreign operators issued with Foreign AOC*
Private Operators	6	*2 of these were Micro-light aircraft operators*
Aviation Training Institution Certificate	12	*9 of these certificates were overseas based Institutes*
Aviation Maintenance Organisation Certificate	24	*13 of these certificates were overseas based Maintenance Organisations*
Remotely Piloted Aircraft Systems	5	*10 RPAS belonging to private individuals were also registered for recreational use*
Skydive Operations	1	*Only 1 sky dive operator*

FLIGHT CREW & ENGINEER LICENCES / MEDICALS

LICENCE TYPE	TOTAL 2014		TOTAL 2015		VARIANCE	
	ISSUE	RENEWAL	ISSUE	RENEWAL	ISSUE	RENEWAL
ATPL	35	257	20	264	(15)	7
CPL	38	282	42	326	4	44
PPL	1	1	7	21	6	20
FTP	42	32	43	31	1	(1)
AME	15	42	10	25	(5)	5
Medical	131	127	127	417	(4)	290

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OPERATIONAL OVERVIEW (2015)-AIR SAFETY DEPARTMENT cont...

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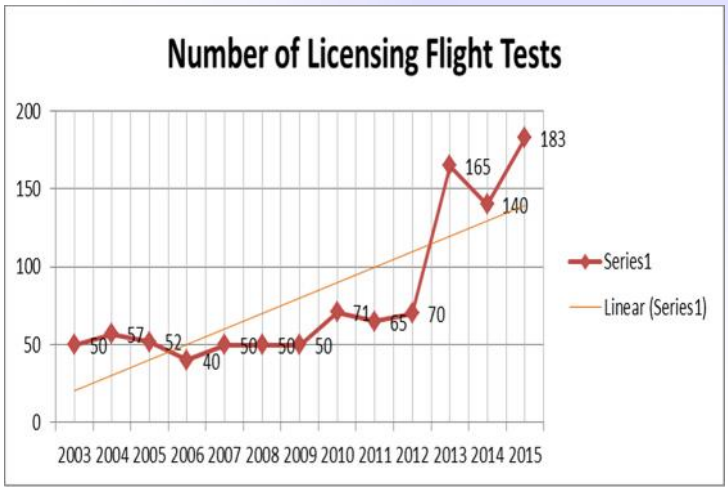
OTHER AVIATION DOCUMENTS

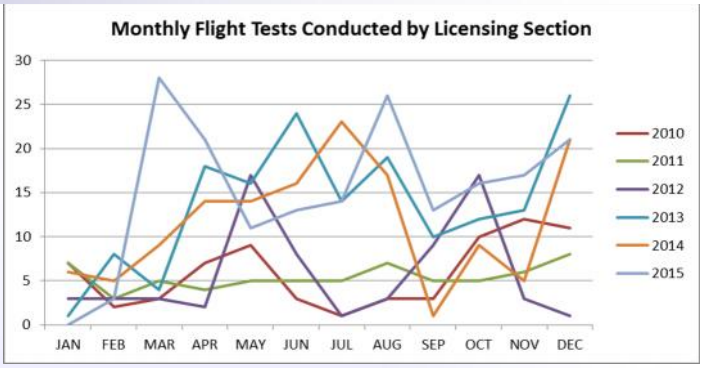
LICENCE TYPE	TOTAL 2014		TOTAL 2015		VARIANCE	
	ISSUE	RENEWAL	ISSUE	RENEWAL	ISSUE	RENEWAL
ANR 45 Approval	6	21	12	43	(⇧6)	(⇧26)
Varidation Issue	42		41		(⇩1)	
Verification Issue	51		54		(⇧3)	

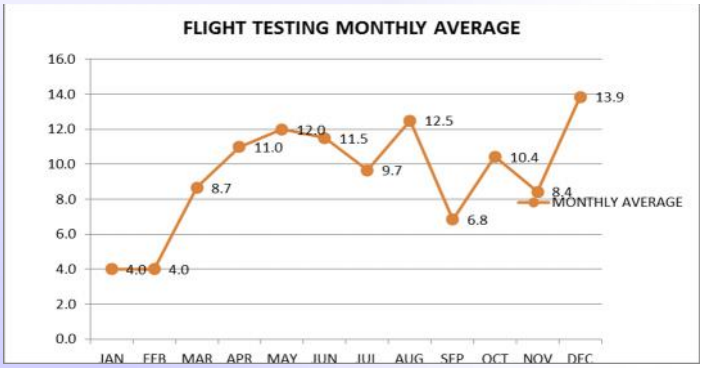
EXAMINATIONS

FLIGHT CREW	TOTAL 2014	TOTAL 2015	VARIANCE
Type Rating	67	76	(⇧9)
Air Law	92	99	(⇧7)
ATPL	228	251	(⇧23)
CPL	250	238	(⇩12)
PPL	0	0	0
FIRX	41	29	(⇩12)
AME	37	39	(⇧2)
AMC	82	88	(⇧6)
Rating	15	5	(⇩10)

CAAF PILOT LICENCE FLIGHT TESTS







AVIATION MEDICAL MATTERS

MEDICAL ACTIVITY	TOTAL 2014	TOTAL 2015	VARIANCE
Number of CAAF AMA	9	10	(⇧1)
Medical Board Sittings	17	18	(⇧1)
Medical cases reviewed by Board	72	41	(⇩31)
Medical reports inspected by Medical Assessor	229	239	(⇧10)
Facility Audits conducted	5	5	0
CAAF AMA Renewal	2	2	0
CAAF AMA Issue	1	1	0

SERVICE DELIVERY

DEPARTMENT/ SECTION	NUMBER OF ACTIVITIES	AVERAGE TARGET (%)	AVERAGE TARGET ACHIEVEMENT (%)
Flight Operations	11	90.91%	83.2%
Airworthiness	10	89%	93%
Personal Licensing-Air Safety	5	91%	95.1%

1. Activities measured : *26*
2. Average target for 26 Activies : *90.3%*
3. Average target achieved : *90.43%*

SIGMET QUICK REFERENCE GUIDE
WS SIGMET

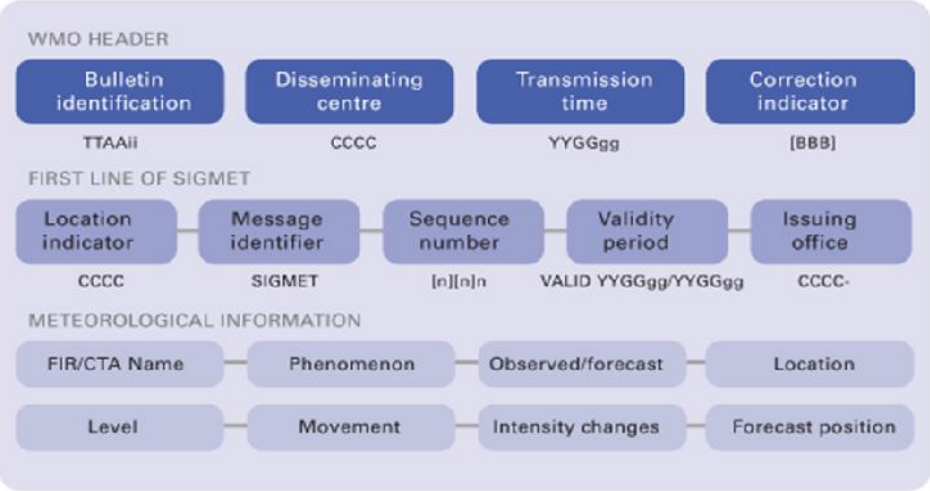
SIGMET Abbreviations

ABV	Above
CNL	Cancel or cancelled
CTA	Control area
FCST	Forecast
FIR	Flight Information Region
FL	Flight level
FT	Feet
INTSF	Intensify or intensifying
KT	Knots
KMH	Kilometres per hour
M	Metres
MOV	Moving
NC	No Change (in intensity)
NM	Nautical Miles
OBS	Observed
SFC	Surface
STNR	Stationary
TOP	Top (of CB cloud)
WI	Within (area)
WKN	Weakening (intensity)
Z	Coordinated Universal Time

WS SIGMET

A SIGMET provides concise information issued by a Meteorological Watch Office (MWO) concerning the occurrence or expected occurrence of specific en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. The WS SIGMET provides information on phenomena other than tropical cyclones and volcanic ash.

SIGMET Structure



WMO Header

Bulletin identification

TT	Data type designator	**WS** – for SIGMET for meteorological phenomena other than volcanic ash cloud and tropical cyclone
AA	Country or territory designators	Assigned according to Table C1, Part II of *Manual on the Global Telecommunication System*, Volume I – *Global Aspects* (WMO Publication No. 386)
ii	Bulletin number	Assigned on national level according to Part II of *Manual on the Global Telecommunication System*, Volume I – *Global Aspects* (WMO Publication No. 386)

Disseminating centre

CCCC is the ICAO location indicator of the communication centre disseminating the message (this may be the same as the MWO location indicator).

Transmission time

YYGGgg is the date/time group; where YY is the day of the month and GGgg is the time of transmission of the SIGMET in hours and minutes UTC (normally this time is assigned by the disseminating (AFTN) centre).

SIGMET QUICK REFERENCE GUIDE cont...
WS SIGMET

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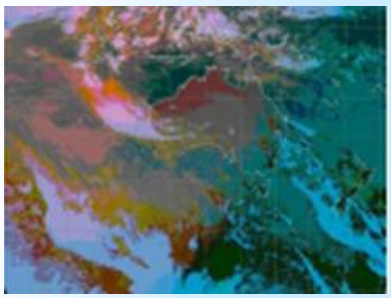

MTSAT-1R icing enhancement. Dark areas indicate the presence of supercooled liquid water (black by night, red by day). High Level cirrus (bright areas) may prevent the satellite from seeing the lower level clouds.

Anvil of a cumulonimbus cloud

Duststorm, Sydney, 23 September 2009. Image courtesy of Elly Spark, Bureau of Meteorology.

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Correction indicator

BBB should only be included when issuing a correction to a SIGMET which had already been transmitted. The BBB indicator shall take the form **CCx** for corrections to previously relayed bulletins, where x takes the value A for the first correction, B for the second correction, etc., for a specific SIGMET.

First Line of SIGMET

Location indicator

CCCC is the ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers.

Message identifier

The message identifier is **SIGMET.**

Sequence number

The daily sequence number in the form **[n][n]n**, e.g. 1, 2, 01, 02, A01, A02, restarts every day for SIGMETs issued from 0001 UTC.

Validity period

The validity period is given in the format **VALID YYGGgg/YYGGgg** where YY is the day of the month and GGgg is the time in hours and minutes UTC. The period of validity for a WS SIGMET shall be no more than 4 hours.

Issuing Office

CCCC- is the ICAO location indicator of the MWO originating the message followed by a hyphen.

Meteorological Information

FIR/CTA Name

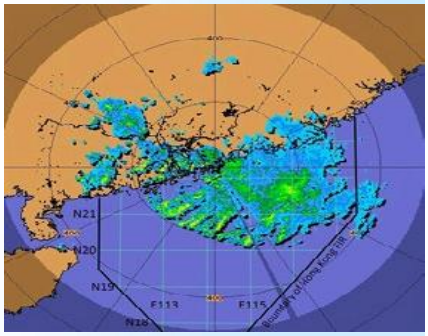
The ICAO location indicator and full name of the FIR/CTA for which the SIGMET is issued in the form **CCCC <name> FIR[/UIR] or CCCC <name> CTA**.

Phenomenon

Code	Description
OBSC TS	Obscured thunderstorms
EMBDTS	Embedded thunderstorms
FRQTS	Frequent thunderstorms
SQLTS	Squall Line thunderstorms
OBSCTSGR	Obscured thunderstorms with hail
EMBDTSGR	Embedded thunderstorms with hail
GRQTSGR	Frequent thunderstorms with hail
SQTSGR	Squall line thunderstorms with hail
SEVTURB	Severe turbulence
SEVICE	Severe icing
SEVICE (FZRA)	Severe icing due to freezing rain
SEVMTQ	Severe mountain wave
HVYDS	Heavy duststorm
HVYSS	Heavy sandstorm
RDOACT CLD	Radioactive cloud

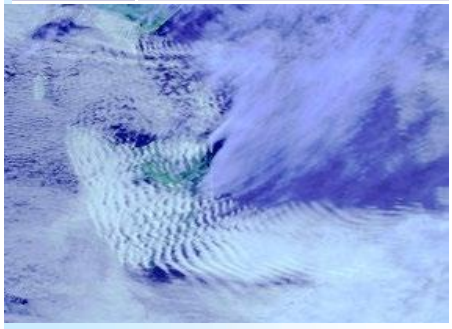
SIGMET QUICK REFERENCE GUIDE cont...
WS SIGMET

(Continued from previous page)



Widespread thunderstorms affecting the Southern China and the northern part of South China Sea on 9 May 2014.

E	East or eastern longitude
ENE	East-north-east
ESE	East-south-east
N	North or northern latitude
NE	North-east
NNE	North-north-east
NNW	North-north-west
NW	North-west
S	South or southern latitude
SE	South-east
SSE	South-south-east
SSW	South-south-west
SW	South-west
W	West or western longitude
WNW	West-north-west
WSW	West-south-west



Satellite image of mountain waves over Tasmania, 3 December 2002.

Observed or forecast

Whether the phenomenon is observed or forecast in the form **OBS [AT GGggZ]** or **FCST [AT GGggZ]** where GG is hours and gg minutes UTC.

Location

The location of the phenomenon is provided with reference to geographical coordinates in latitude and longitude in degrees and minutes.

Level

The level or vertical extent of the phenomenon:
FLnnn or **nnnnM** or **nnnnFT** or **SFC/FLnnn** or **SFC/NNNNm** or **SFC/nnnnFT** or **FLnnn/nnn** or **nnnn/nnnnFT** or **TOP FLnnn** or **ABV FLnnn** or **TOP ABV FLnnn**.

Movement

Direction and rate of movement of the phenomenon where the direction is given with referece to one of the sixteen points of the compass (using the appropriate abbreviation) and the rate is given in KT (or KMH) in the form **MOV <direction> <speed>KT** or **KMH.** The abbreviation **STNR** (Stationary) is used if no significant movement is expected.

Intensity changes

The expected evolution of the phenomenon's intensity as indicated by:
INTSF or **WKN** or **NC**

Forecast position (optional)

The forecast position of the hazardous phenomena at the end of the avlidity period of the SIGMET message in the form **FCST<GGgg>Z<location>.**

Renewing a SIGMET

A SIGMET is renewed with a new sequence number when the validy period is due to expire but the phenomenon is expected to persist.

Cancelling a SIGMET

If, during the validity period of a SIGMET, the phenomenon for which the SIGMET was issued is not longer occurring or is no longer expected, the SIGMET shall be cancelled by issuing a SIGMET with the abbreviation CNL in lieu of meteorological information. **CNL SIGMET [n][n]n YYGGgg/YYGGgg**

Source of Information

Source of Information	Phenomena
Surface and upper-air observations Special AIREP Satellite Pictures NWP forecasts	Thunderstorms, dust/sandstorms, turbulence, mountain waves, icing
RADAR Lightning information	Thunderstorms
WMO RSMC (Atmospheric transport modelling for environmental emergency)	Radioactive cloud

SIGMET Dissemination

SIGMET is part of operational meteorological (OPMET) information and should be exchanged via aeronautical fixed service (AFS). The SIGMET priority indicator used shall be FF.

(Continued to next page)

SIGMET QUICK REFERENCE GUIDE cont...
WS SIGMET

WS Examples

Format

WSAAii CCCCYYGGgg [BBB]
CCCC SIGMET [n][n]n VALIDYYGGgg/YYGGgg CCCC-
CCCC <FIR/CTA Names> FIR <Phenomenon> OBS/FCST
[AT GGggZ] <Location> <Level> <Movemebt> <Intensity
Changes> <Forecast position>=

Thunderstorms

WSSS20 VHHH 090900
VHHK SIGMET 3 VALID 090900/091300 VHHH-
VHHK HONG KONG FIR EMBD TS OBS AT 0900Z N OF
N2000 AND E OF E11330 TOP FL400 INTSF FCST 1300Z
N OF N2000 AND E OF E11300=

Duststorms

WSAU21 ADRM 240330
YMMM SIGMET D01 VALID 240330/240430 YPDM-
YMMM MELBOURNE FIR HVY DS OBS WI S2300
E13415—S2240 E13800—S2520 E13800—S2525
E13520—S2300 E13415 SFC/7000FT MOV N 25KT NC=

Sandstorms

WSC133 ZBAA 301110
ZBPE SIGMET 2 VALID 301110/301510 ZBAA-
ZBPE BEIJING FIR HVY SS OBS AT 1100Z N OF N40
SFC/2000M MOV E 30KMH NC=

Turbulence

WSNZ21 NZKL 232134
NZZC SIGMET 18 VALID 232134/240134 NZKL-
NZZC NEW ZEALAND FIR SEV TURB FCST WI S3929
E17602—S4305 E17136—S4522 E17000—S4538
E17159—S4112 E17624—S3929 E17602 FL180/260 MOV
E 25KT—INTSF=

Mountain Waves

WSAU21 AMRF 061700
YMMM SIGMET M07 VALID 061700/062100YMRF-
YMMM MELBOURNE FIR SEV MTW OBS WI S3704 E14244
-S3611 E14753—S3736 E14943—S4006 E14800 –S3952
E14353—S3704 E14244 FL080/140 STNR NC=

Icing

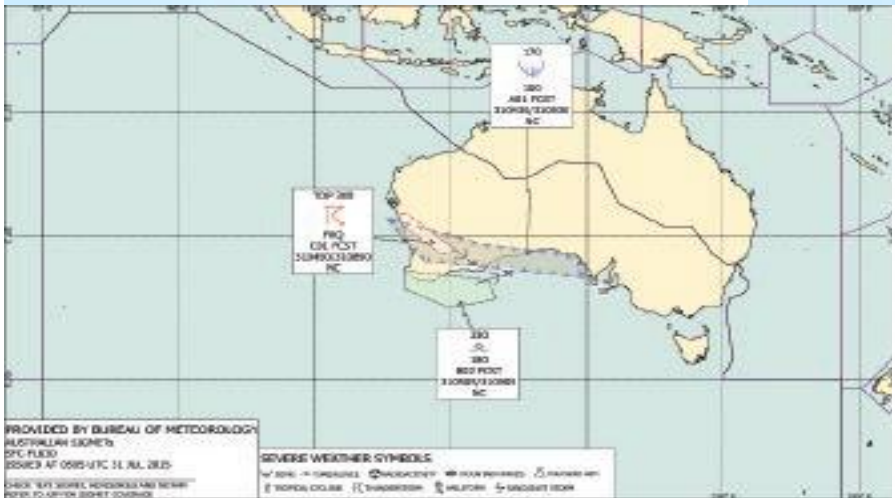
WSC145 ZHHH 021100
ZHWH SIGMET 3 VALID 021100/021500 ZHHH-
ZHWH WUHAN FIR SEV ICE FCST N OF N28 SFC/FJ200
STNR NC=

Radioactive cloud

WSSS20 VHHH 180830
VHHK SIGMET 1 VALID 180830/181230 VHHH-
VHHK HONG KONG FIR RDOACT CLD FCST E OF E114
SFC/FL100 MOV E 20KT WKN=

Cancellation

WSSS20 VHHH 181100
VHHK SIGMET 2 VALID 181100/181230 VHHH-
VHHK HONG KONG FIR CNL SIGMET 1 180830/181230=



Australian Government
Bureau of Meteorology

CAA CIVIL AVIATION AUTHORITY OF NEW ZEALAND

香港天文台 HONG KONG OBSERVATORY

Refer to the following for more information

ICAO *Annex 3 – Meteorological Service for International Air Navigation* (Amd 76)
ICAO *Regional SIGMET Guide*
ICAO Doc.8896 – *Manual of Aeronautical Meteorological Practice*
WMO No.49 *Technical Regulations Volume II – Meteorological Service for International Air Navigation* (2013 ed)
WMO No.732 *Guide to Practices for Meteorological Offices Serving Aviation*

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Your suggestions for improvements to this publication are also invited. CAAF also invites you to submit valuable information or articles that you would like to have published through this bulletin for the benefit of readers. Your name will be appropriately acknowledged. Please use the email address stated above.

FCAIR

FIJI CONFIDENTIAL AVIATION INCIDENT REPORTING FORMS AVAILABLE ON WEBSITE

www.caaf.org.fj

OR FRONT DESK, CAAF HQ

HEALTH TIPS—INSOMNIA

What is Insomnia

Insomnia is difficulty falling asleep or staying asleep, even when a person has the chance to do so. People with insomnia can feel dissatisfied with their sleep and usually experience one or more of the following symptoms: fatigue, low energy, difficulty concentrating, mood disturbances, and decreased performance in work.

What causes Insomnia

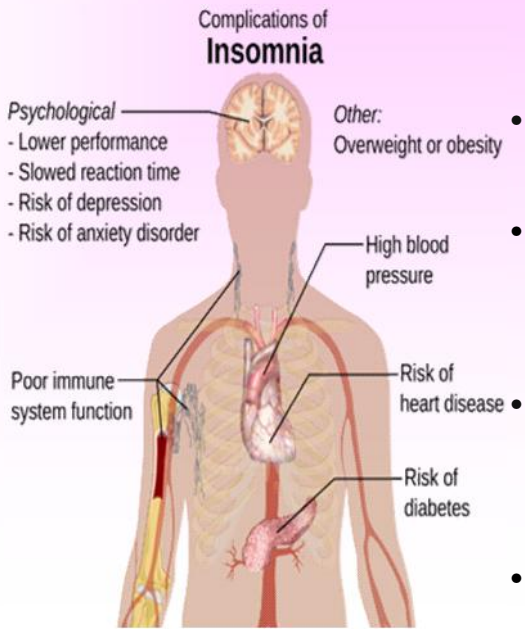
Common Causes of Insomnia include:

- Stress.
- Anxiety.
- Depression.
- Medication.
- Caffeine.
- Eating too much at night.

Symptoms of Insomnia

People with insomnia have one or more of the following symptoms:

- Difficulty falling asleep.
- Difficulty staying asleep (waking up during the night and having trouble returning to sleep).
- Waking up too early in the morning.
- Unrefreshing sleep (also called "non-restorative sleep").
- Fatigue or low energy.
- Cognitive impairment, such as difficulty concentrating.
- Mood disturbance, such as irritability.
- Behavior problems, such as feeling impulsive or aggression.
- Difficulty at work or school.
- Difficulty in personal relationships, including family, friends and caregivers.



Physical, Emotional , and Cognitive Effects of Insomnia

- Mood changes, irritability, poor concentration , memory defects, etc.
- Impairs creative thinking, verbal processing, problem solving.
- Risk of errors, accidents due to excessive daytime sleepiness.
- Increased appetite, decreased body temperature.
- Physiologic effects.

Insomnia Treatments

- **Stimulus control therapy.** This helps remove factors that condition the mind to resist sleep. For example, you might be coached to set a consistent bedtime and wake time and avoid naps, use the bed only for sleep.
- **Sleep restriction.** Lying in bed when you're awake can become a habit that leads to poor sleep. This treatment decreases the time you spend in bed, causing partial sleep deprivation, which makes you more tired the next night. Once your sleep has improved, your time in bed is gradually increased.
- **Sleep hygiene.** This involves changing basic lifestyle habits that influence sleep, such as smoking or drinking too much caffeine late in the day, drinking too much alcohol, or not getting regular exercise.
- **Sleep environment improvement.** This can create a comfortable sleep environment, such as keeping your bedroom quiet, dark and cool, not having a TV in the bedroom, and hiding the clock from view.
- **Relaxation training.** This helps you calm your mind and body. Approaches include meditation, imagery, muscle relaxation and others.
- **Remaining passively awake.** Also called paradoxical intention, this involves avoiding any effort to fall asleep. Paradoxically, worrying that you can't sleep can actually keep you awake. Letting go of this worry can help you relax and make it easier to fall asleep.
- **Biofeedback.** This allows you to observe biological signs such as heart rate and muscle tension and shows you how to adjust them. Your sleep specialist may have you take a biofeedback device home to record your daily patterns. This information can help identify patterns that affect sleep.
- If still no improvement than see Doctor for further treatment. ■

NOTICE TO AIR TRAVELLERS—GALAXY NOTE 7