

PERTH INTERNATIONAL AIRPORT

AIRCRAFT NOISE MANAGEMENT STRATEGY

Prepared for: The Minister for Transport and Regional Services

Prepared by: Westralia Airports Corporation Pty. Ltd.
Perth International Airport

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GLOSSARY

ABBREVIATIONS

1. Introduction

In accordance with the Airports Act 1996, Westralia Airports Corporation (WAC) prepared a Master Plan which sets out the development potential for Perth International Airport. After an extensive period of public consultation the Master Plan was approved by the Minister for Transport and Regional Services on 18 May 1999.

The Act states, among other things, that a Master Plan must specify the airport's plans, developed through a consultative process with airlines and local government bodies in the vicinity of the airport, for managing aircraft noise intrusion in areas forecast to be subject to exposure above significant ANEF levels. Significant ANEF levels are defined as exceeding 30.

As part of WAC's ongoing consultative process and as stated in the approved Master Plan, WAC is committed to working with airlines, air traffic controllers and relevant government agencies to manage aircraft noise intrusion. A primary initiative in this regard was the formation of a Noise Management Committee. The principal purpose of the Committee is to contribute to the development of a Noise Management Strategy for Perth International Airport.

The Minister, in approving the Master Plan, placed reliance on the establishment of the Noise Management Committee as a consultative mechanism providing a forum for representatives of local government and the community to work cooperatively with representatives of the aviation industry.

The Minister stressed the need for meaningful consultation and community input. The efforts of the Committee, which deliberated for one year, have resulted in a Noise Management Strategy which balances the vital commercial objectives of those who utilise the airport with the rights of the communities which endure the audible by-product of the airport's growing operations.

2. Development of the Noise Management Strategy

WAC undertook an extensive program of stakeholder and community consultation through the Noise Management Committee to develop this strategy.

Membership of the Committee was kept to a workable level by restricting it to one member from each organisation representing relevant Commonwealth and State Government departments, Local Government, airlines, federal members of parliament and community groups. (Refer to Appendix 1). Members were invited to bring guests as observers or where specialist advice to the committee was required.

The Terms of Reference of the Committee are set out in Appendix 2.

Members of the Committee were provided with detailed technical and operational briefings by representatives of WAC, Airservices Australia, Department of Transport and Regional Services, Ansett Australia and Qantas Airways. The briefings covered the master planning process, alternative ways of presenting information on aircraft noise, the role of air traffic control, aircraft noise management including international noise standards, flight paths and aircraft operating procedures.

Many of the issues raised by the Committee had already been addressed over the years resulting in certain processes and procedures being adopted to reduce aircraft noise impacts on the community. Committee members were briefed on existing measures, which formed the starting point for the new strategy. With technological advances, this strategy will provide a framework within which the amelioration of aircraft noise on the community can continue to be developed.

During the Committee's deliberations it became obvious that in order to analyse the many issues being raised, it would be necessary to form working groups to provide a greater concentration on significant issues. All issues were consolidated for consideration into three main categories and a working group for each category was formed by volunteers from the Noise Management Committee. (Refer to Appendix 3). These were: -

- Working Group A – Infrastructure and Operations
- Working Group B – Land Use Planning
- Working Group C – Education

During the Committee's deliberations, the Western Australian Planning Commission (WAPC) formed a Working Group to investigate and report on land use planning in the vicinity of Perth International Airport. It was agreed that Members of the Noise Management Committee Working Group B be represented on the Commission's Working Group. The majority of issues relating to Working Group B overlap with the role of the Commission's Working Group. It was therefore agreed by both parties that the Commission's Working Group take over responsibility for these issues. Since a final report by the Commission's Working Group is not due for release until January 2001, any related strategies developed by the Committee could be premature. Accordingly, the ongoing Noise Management Committee will monitor the outcome of the Commission's work.

Many of the issues presented by the Working Groups are complex and require ongoing liaison between government agencies, the airlines, and the community. WAC is appreciative of the efforts of Committee members to constructively debate often conflicting views and opinions. This has enabled WAC to assess opinions from both industry and community perspectives before determining the position to incorporate into the strategy.

The final strategy response to the issues is outlined in Section 3 of this document. Each strategy is stated in broad terms followed by the necessary commitments and required action.

The implementation plan is outlined in Section 4.

The recommendation for an ongoing Committee is part of this strategy which is outlined in Section 5.

3. Strategy

Strategy 1 Review of land use planning in the vicinity of Perth International Airport

Action

- a) Continue to work closely with the WAPC's Working Group, to develop a state land use planning policy for the vicinity of Perth International Airport.

Strategy 2 Review the existing Noise Abatement Procedures

Action

- a) Examine, by way of a desktop analysis, whether significant benefits to the community would be achieved by ensuring that all aircraft above 5,700kg use the full length of runway 03/21 for take-off between the hours of 2300 and 0600. If benefits are considered significant, by the NMC, either instigate a trial to verify results, or implement the procedure as soon as possible.
- b) Investigate effects of suggested changes to flight paths as proposed by the NMC. (Currently the early left turn off runway 21 to avoid Queens Park and the early right turn off runway 03 to avoid South Guildford are being investigated).
- c) Examine which noise abatement departure procedures are currently used by the airlines, and analyse from past studies or if necessary, new desktop studies, whether significant benefits to the community would be achieved by adopting alternative procedures. If benefits are considered significant, instigate either a trial to verify the results, or implement the procedure as soon as possible.

Strategy 3 Determine whether aircraft engine ground running noise is of concern to the community

Action

- a) Monitor aircraft ground running to identify if there is a noise problem.

Strategy 4 Produce and monitor Australian noise exposure contour plans

Action

- a) The NMC to produce a revised agreed ANEF.
- b) Generate an ANEI on an annual basis in order to assess noise contours against the agreed ANEF.
- c) Review the ANEF every 5 years, as part of the Master Plan process.
- d) Monitor the ANEI against the land use planning tool adopted by the Western Australian Planning Commission, to determine whether noise exposure is likely to be exceeded. Should this occur, consider available options to minimise the noise impacts.

Strategy 5 Enhance the existing noise monitoring program

Action

- a) Ensure all noise monitoring terminals are placed, wherever possible, directly under flight paths.
- b) Consider a noise monitoring program for significant aircraft noise affected residences, to identify internal dB(A) levels from all noise sources to obtain data for noise impact assessment.

Strategy 6 Produce an Environmental Impact Statement for the parallel runway

Action

- a) As part of the Major Development Plan, prior to the construction of the parallel runway, prepare an EIS as early as is practically possible.

Strategy 7 Inform existing and prospective owners of properties of aircraft noise impacts

Action

- a) Ensure that memorials are added, where possible, to all Land Title Certificates for properties in aircraft noise affected areas of 20 ANEF and above.
- b) Ensure that for all properties within the 20 ANEF, Councils indicate on Land Information Certificates that such properties may be affected by aircraft noise.
- c) Develop and produce an Information Package about aircraft generated noise.

- d) Investigate the benefits of using the Internet for aircraft noise complaints.
- e) Investigate other possible mechanisms such as N70 contours to better inform the community about aircraft noise.
- f) Establish an annual forum or workshop to educate Local Government planners, real estate agents and other interested parties on aircraft noise.

Strategy 8 Educate the community about airport operations

Action

- a) Expand the noise section of the WAC Annual Environment Report and the WAC web site.
- b) Provide information to the community, via community newspapers, of the availability of the WAC Annual Environment Report and the Noise Information Package.
- c) Improve the noise complaint procedure to provide feedback concerning complaints and/or inquiries.

Strategy 9 Regular publication of Australian noise exposure contour plans

Action

- a) Include the current ANEI, ANEF and ANEC (if produced), on the WAC web site, the WAC Annual Environment Report and the noise information package.

Strategy 10 Continue community consultation on airport noise

Action

- a) Establish an ongoing Noise Management Committee to implement and monitor the Noise Management Strategy.
- b) The ongoing Noise Management Committee to consider the development of an MOU. An MOU will formalise the respective organisations commitments to the approved Noise Management Strategy.

Action to be implemented	Responsible Party	Assisted by
c) Examine which noise abatement departure procedures are currently used by the airlines, and analyse from past studies or if necessary, new desktop studies, whether significant benefits to the community would be achieved by adopting alternative procedures. If benefits are considered significant, instigate either a trial to verify the results, or implement the procedure as soon as possible.	Airservices	Airlines
<p>Strategy 3 <u>Determine whether aircraft engine ground running noise is of concern to the community</u></p> <p>a) Monitor aircraft ground running to identify if there is a noise problem.</p>	WAC	Airlines & DEP
<p>Strategy 4 <u>Produce and monitor Australian noise exposure contours</u></p> <p>a) The NMC will produce a revised agreed ANEF.</p> <p>b) Generate an ANEI on an annual basis in order to assess noise contours against the agreed ANEF.</p> <p>c) Review the ANEF every 5 years, as part of the Master Plan process.</p> <p>d) Monitor the ANEI against the land use planning tool adopted by the Western Australian Planning Commission, to determine whether noise exposure is likely to be exceeded. Should this occur, consider available options to minimise the noise impacts.</p>	<p>WAC</p> <p>WAC</p> <p>WAC</p> <p>NMC</p>	<p>Airservices, WAPC & NMC</p> <p>Airservices</p> <p>Airservices</p>
<p>Strategy 5 <u>Enhance the existing noise monitoring program</u></p> <p>a) Ensure all noise monitoring terminals are placed, wherever possible, directly under flight paths.</p> <p>b) Consider a noise monitoring program for significant aircraft noise affected residences, to identify internal dB(A) levels from all noise sources to obtain data for noise impact assessment.</p>	<p>Airservices</p> <p>DOT/DEP</p>	

Action to be implemented	Responsible Party	Assisted by
<p>Strategy 6 <u>Produce an Environmental Impact Statement for the parallel runway</u></p> <p>a) As part of the Major Development Plan, prior to the construction of the parallel runway, prepare an EIS as early as is practically possible.</p>	WAC	
<p>Strategy 7 <u>Inform existing and prospective owners of properties of aircraft noise impacts</u></p> <p>a) Ensure that memorials are added, where possible, to all Land Title Certificates for properties in aircraft noise affected areas of 20 ANEF and above.</p> <p>b) Ensure that for all properties within the 20 ANEF, Councils indicate on Land Information Certificates that such properties may be affected by aircraft noise.</p> <p>c) Develop and produce an Information Package about aircraft generated noise.</p> <p>d) Investigate the benefits of using the Internet for aircraft noise complaints.</p> <p>e) Investigate other possible mechanisms such as N70 contours to better inform the community about aircraft noise.</p> <p>f) Establish an annual forum or workshop to educate Local Government planners, real estate agents and other interested parties on aircraft noise.</p>	<p>WAPC & Local Government</p> <p>WAPC & Local Government</p> <p>WAC</p> <p>Airservices</p> <p>WAC</p> <p>WAC</p>	<p>NMC</p> <p>NMC</p> <p>NMC</p> <p>NMC</p> <p>NMC</p> <p>NMC</p>

Action to be implemented	Responsible Party	Assisted by
<p>Strategy 8 <u>Educate the community about airport operations</u></p> <p>a) Expand the noise section of the WAC Annual Environment Report and the WAC web site.</p> <p>b) Provide information to the community, via community newspapers, of the availability of the WAC Annual Environment Report and the Noise Information Package.</p> <p>c) Improve the noise complaint procedure to provide feedback concerning complaints and/or inquiries.</p>	<p>WAC</p> <p>WAC</p> <p>Airservices</p>	
<p>Strategy 9 <u>Regular publication of Australian noise exposure contours</u></p> <p>a) Include the current ANEI, ANEF and ANEC (if produced), on the WAC web site, the WAC Annual Environment Report and the noise information package.</p>	<p>WAC</p>	
<p>Strategy 10 <u>Continue community consultation on airport noise</u></p> <p>a) Establish an ongoing Noise Management Committee to implement and monitor the Noise Management Strategy.</p> <p>b) The ongoing Noise Management Committee to consider the development of an MOU. An MOU will formalise the respective organisations commitment to the approved Noise Management Strategy.</p>	<p>WAC</p> <p>NMC</p>	

5. Monitoring and Review

The progress made towards achieving the actions of the strategies needs to be closely monitored.

The success of the strategy will be enhanced through rigorous evaluation of the progress of implementing the actions, and by updating and amending as necessary. The coordinating body for this monitoring process will be the Noise Management Committee, which the WAC will convene and chair on an ongoing basis, to ensure the strategy is implemented. This will be achieved through consultation with representatives from the community, local government, government agencies and the airlines.

APPENDIX 1

NOISE MANAGEMENT COMMITTEE MEMBERSHIP

NOISE MANAGEMENT COMMITTEE MEMBERSHIP

Representatives from the following organisations formed the Noise Management Committee:-

Westralia Airports Corporation

Dept. of Transport & Regional
Services

Airservices Australia

Dept of Transport

Ministry for Planning

Dept. of Environment Protection

City of Belmont

City of Canning

Shire of Kalamunda

Shire of Swan

Shire of Mundaring

City of Gosnells

City of Bayswater

Qantas Airways

Ansett Australia

Pearl Aviation

Member for Swan

Member for Pearce

The Guildford Association

Cannington Ratepayers &

Residents Association

APPENDIX 2

TERMS OF REFERENCE

Perth International Airport
NOISE MANAGEMENT COMMITTEE
TERMS OF REFERENCE

Purpose

The purpose of the Noise Management Committee is to prepare a Noise Management Strategy for Perth International Airport. In doing so, it will provide a consultative mechanism to ensure that:

- 1) the community surrounding Perth International Airport is aware of the potential impact of aircraft noise from the operation and development of Perth International Airport; and
- 2) the Committee is aware of the social and economic impact of the airport on surrounding communities.
- 3) the Western Australian Planning Commission can achieve land use surrounding Perth International Airport which is compatible with the future operation of the Airport.

Scope

In its deliberations, the Noise Management Committee will give consideration to:

- 1) the Perth International Airport Master Plan, aircraft flight paths and noise abatement procedures;
- 2) noise and flight path monitoring systems;
- 3) current and alternative mechanisms used for land use planning surrounding airports;
- 4) environmental regulations;
- 5) airport operational procedures (eg ground running, take-off procedures);
- 6) initiatives for noise mitigation at point of reception; and
- 7) contemporary methods for ascertaining the effect on the community of aircraft noise.
- 8) ways of providing education and information to the community.

Membership

Membership of the Committee will be determined by Westralia Airports Corporation and will comprise representatives of municipalities affected by aircraft noise and community representatives from high

noise affected areas. Representatives from relevant State and Federal Government agencies will also participate, together with representatives of the aviation industry.

Each member of the Committee is to ensure that progress achieved by the committee is communicated effectively to the organisation or groups that the individual represents.

Administration

Initially Noise Management Committee meetings will be held monthly. Westralia Airports Corporation will chair the meetings and provide secretarial services.

Noise Management Strategy

Following deliberations, the Noise Management Committee will develop a Perth International Airport noise management strategy for recommendation to the Commonwealth Minister for Transport and Regional Services. The recommendation is to be given to the Minister within 12 months of the inaugural meeting of the Committee (ie May 2000).

The Noise Management Strategy will include:

- Noise abatement procedures
 - airborne, ground running
- Land use planning procedures
- Reporting of noise events/noise complaints
- Process to assist mitigation of aircraft noise
- Mechanisms for providing information to the community regarding airport related noise.

Voting

The Committee will seek to achieve consensus on issues relevant to the formalisation of the Noise Management Strategy, however, when necessary, important and contentious matters before the Committee will be decided by a majority vote. If a result is evenly split, then the Chairman may exercise the casting vote. Those Committee members who oppose the result may request to have their views recorded in the meeting minutes.

APPENDIX 3

WORKING GROUPS

MATTERS TO CONSIDER FOR INCLUSION IN THE MANAGEMENT STRATEGY

**PERTH INTERNATIONAL AIRPORT
NOISE MANAGEMENT COMMITTEE**

WORKING GROUPS

**MATTERS TO CONSIDER FOR INCLUSION IN THE NOISE MANAGEMENT
STRATEGY**

Group A – Infrastructure & Operations

Membership:-

Belyea, Nick	Dept of Transport	Hart, Sue	The Guildford Association
Bourke, Bill	Qantas	McDonald, Gary	Pearl Aviation
Brown, Ken (Chair)	Airservices Australia	Petersen, Torb	WAC
Burrows, Sue	Shire of Kalamunda	Rhodes, Angela	Ansett Australia
Devenish, Stuart	City of Canning	Schokker, Hank	Cannington Ratepayers & Residents Assoc.
Geraghty, Terry	Shire of Mundaring		

Issues to be identified:-

- Early construction of parallel runway.
- Parallel runway construction only when existing runways reach capacity.
- Improvements to the noise abatement procedures.
- Minimising noise impacts from engine ground running.
- Changes to Standard Instrument Departures (SIDS) and Standard Arrivals (STAR).
- A quieter aircraft fleet.
- Revision to flight tracks.
- Minimum height requirements for landing aircraft.
- Steeper takeoff procedures.
- Improvements to Airservices Australia complaints mechanism.
- How to deal with current activities that generate noise complaints.
- Fines and penalties for airlines breaching noise abatement procedures.
- Location of NMTs.

Group B – Land Use Planning (Ministry for Planning)

Membership:-

Belyea, Nick	Dept of Transport	Richardson, Martin	Shire of Swan
Burrows, Sue	Shire of Kalamunda	Representatives from:-	
Davies, Jim	WAC	Airservices Australia (Canberra)	
Egan, Janine	City of Belmont	DoTRS (Canberra)	
Nunn, David	Ministry for Planning	City of Canning	

Issues to be identified:-

- Noise amelioration program.
- Noise attenuation to affected properties.
- Appropriate tool for describing aircraft noise impacts to individuals.
- Addition of 15 ANEF contour on ANEF drawing.
- Revision to the ANEF.
- Land use planning approaches to aircraft noise.
- Assessment of the environment , social and economic effects of aircraft noise on communities.
- Is the ANEF the appropriate measure for land use planning.
- Assessment of aircraft noise effects on land uses and identification of exclusion zones.

Group C - Education

Membership:-

Blair, Marion (Chair)	City of Belmont	Innes, Shelley	WAC
Geraghty, Terry	Shire of Mundaring	Langford, Dick	DEP
Hart, Sue	The Guildford Association	Ponton, Gavin	City of Canning

Issues to be addressed:-

- Informing existing and prospective owners of properties of noise impacts.
- Educating the community about airport operations.
- ANEIs published on a regular basis.
- Educating the community about airport operations.
- An MOU between agencies confirming agreed strategies.
- Ongoing committee to monitor and evaluate strategy outcomes and deal with any new airport noise issues.
- Terms of Reference and membership for an ongoing committee.

Working Group Tasks:-

- Elect a chairperson.
- Consider the issues as raised.
- Consider the appropriateness of the issues.
- Consider other related issues. (either within/outside the working group).
- Provide recommendations for consideration by the NMC.

GLOSSARY

Glossary

Aerodrome Reference Point (ARP)

The designated geographical location of the aerodrome. This is fixed as near as possible to the geometric centre of the aerodrome taking into account possible future development. The location is given to the nearest second of latitude and longitude.

Aerodrome Reference Temperature

The monthly mean of the daily maximum temperatures for the hottest month of the year. The reference temperature is averaged over a period of years and is expressed in degrees Celsius.

Aeroplane Reference Field Length

The minimum field length required for take-off at maximum certified take-off mass, sea level, standard atmospheric conditions, still air and zero runway slope, as shown in the appropriate aeroplane flight manual prescribed by the certification authority or equivalent data from the aeroplane manufacturer. Field length means balanced field length for aeroplanes, if applicable, or take-off distances in other cases.

Airside

The movement area of an aerodrome, adjacent terrain and buildings or portions thereof, access to which is controlled.

Airspace

That portion of the earth's atmosphere over which a nation exercises jurisdiction over aircraft in flight. The continental division of airspace usually coincides with the national boundaries and the oceanic division is determined by mutual agreement of the nations concerned.

Altitude

The vertical distance of a level or a point, or an object considered as a point, measured from mean sea level. (In accordance with international civil aviation practices, altitude is measured in feet).

Approach Area

A specified portion of the surface of ground or water at the end of the runway strip, defined by the vertical projection of the approach surface. It is an area within which it may be necessary to restrict the creation of new obstacles or remove or mark existing obstacles in order to ensure a satisfactory level of safety for aeroplane operations during the approach phase.

Approach Surface

(see Obstacle Limitation Surfaces).

Apron

A defined area on a land aerodrome intended to accommodate aircraft for the purpose of loading and unloading passengers, mail or cargo, fuelling, parking or maintenance.

Australian Height Datum (AHD)

A homogeneous levelling network covering the whole of the Australian mainland, which is based on the mean sea level at 31 tide gauges around the Australian coastline. This datum was adopted by the National Mapping Council in 1971 and provides a standard, accurate levelling reference for scientific, mapping and engineering purposes. (AHD does not include Tasmania which has its own height datum).

Australian Noise Exposure Forecast (ANEF)

Shows the best estimate of future noise exposure levels for a particular year.

Australian Noise Exposure Concept (ANEC)

Is a planning tool and used to test changes to noise exposure resulting from proposed changes to aerodrome operations. It shows a hypothetical future.

Australian Noise Exposure Index (ANEI)

Is the actual noise exposure for some previous time period, generally a year.

Automatic Direction Finder (ADF)

An airborne radio navigational aid providing the relative bearing between the aircraft heading and a non-directional beacon (NDB) or broadcasting station. (Also known as a radio compass).

Building Area

An area on an aerodrome, outside the movement area, allocated for the provision of administration, aircraft maintenance and passenger, freight or other facilities. A building area may also contain fuel depots.

Conical Surface

(see Obstacle Limitation Surfaces).

Critical Obstacle

The obstacle within the take-off climb area and/or approach area which subtends the greatest vertical angle when measured from the inner edge of the take-off climb/approach surface.

Declared Distances

The operational lengths of the runway associated with take-off and landing of aeroplanes. (see Take-off Run Available (TORA), Take-off Distance Available (TODA), Accelerate-Stop Distance Available (ASDA) and Landing Distance Available (LDA).

Distance Measuring Equipment (DME)

An airborne radio navigational aid providing an indication of distance to a selected ground beacon.

Elevation

In relation to flight, means the vertical distance of a point or a level on or affixed to the surface of the earth, measured from mean sea level. (For the purposes of aeronautical information, the measurement of altitude, elevation and height is expressed in units of feet).

Flight Path

The airspace connecting two locations and surrounding the actual or proposed track of the aircraft. Flight plan: Specified information provided to air traffic service units, relative to an intended flight or portion of a flight of an aircraft.

Inner Horizontal Surface

(see Obstacle Limitation Surfaces).

Instrument Approach Procedure

The approved procedure to be allowed by aircraft in descending from cruising level and landing at an aerodrome. It involves a series of predetermined manoeuvres for the orderly transfer of an aircraft by reference to night instruments, from the beginning of the initial approach to a landing or to a point from which a landing may be made visually.

Instrument Flight Rules (IFR)

A set of rules, as outlined in Part XI of the Civil Aviation Regulations, governing the conduct of flight under instrument meteorological conditions.

Instrument Flight Rules (IFR) Operation

An operation conducted in accordance with the Instrument Flight Rules prescribed in Part XI of the Civil Aviation Regulations. These operations (landings and take-offs at an aerodrome) are made in periods of inclement weather and poor visibility and under these conditions, positive control on approach and climb-out is maintained by the use of electronic navigational aids.

Instrument Meteorological Conditions (IMC)

Meteorological conditions expressed in terms of visibility, distance from cloud and ceiling less than minima specified for visual meteorological conditions.

Instrument Non-precision Approach Runway

An instrument runway served by visual aids and a non-visual aid providing at least directional guidance adequate for a straight in approach.

Landing Distance Available (LDA)

The length of runway which is declared available and suitable for the ground run of an aeroplane landing. The LDA commences at the threshold and extends for the length of the runway thereafter. In most cases, this corresponds with the physical length of the runway, however in some cases the threshold may be displaced from the runway extremity thus giving a LDA less than the total runway length.

Landside

That portion of an aerodrome not designated as airside and to which the general public normally has free access.

Maneuvering Area

That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

Maximum Take-Off Mass (MTOM)

The mass set out in the certificate of airworthiness of, or the flight manual for the aircraft as the maximum mass permitted for take-off.

Minimum Descent Altitude (MDA) or Minimum Descent Height (MDH)

A specific altitude or height in a non-precision approach or circling approach below which descent must not be made without the required visual reference.

Movement

Either a take-off or a landing by an aircraft.

Movement Area

That part of an aerodrome to be used for the surface movement of aircraft, including the manoeuvring areas and aprons.

Non-Directional Beacon (NDB)

A ground radio station emitting continuous signals and providing an omnidirectional radiating pattern which is used in conjunction with airborne ADF equipment to provide directional guidance to aircraft.

Non-Instrument (Approach) Runway

A runway intended for operation of aeroplanes using visual approach procedures.

Obstacles

All fixed (temporary or permanent) and mobile objects, or parts thereof, which are located on an area intended for the surface movement of aircraft, or which extend above a defined surface intended to protect aircraft in flight.

Obstruction

An obstacle which prevents aircraft operations to or from a runway.

Operator

A person, organisation or enterprise engaged in, or offering to engage in, an aircraft operation.

Obstacle Limitation Surfaces (OLS)

A series of planes associated with each runway of an aerodrome and which define the desirable limits to which objects may project into the airspace around the aerodrome. Obstacles penetrating an OLS may need to be marked and/or lit in accordance with CASA requirements. Definitions of individual OLS are:

- conical surface;
 - a surface sloping upward and outward from the periphery of the inner horizontal surface to a specified height above that surface
- inner horizontal surface;
 - a plane at a specified height above the aerodrome reference elevation datum extending to a specified outer boundary
- approach surface;
 - an inclined plane or combination of planes originating at the inner edge associated with each runway threshold
- transitional surface;

- inclined planes which originate from the edges of the runway strip and the sides of the approach surface and extend upward and outward at a specified rate to the inner horizontal surface
- take-off climb surface;
 - a plane originating at the end of the clearway, sloping upward and diverging at a specified rate.

Precision Approach Path Indicator System (PAPI)

An ICAO approved approach slope indicator system designed to show red and white lights on correct approach slope, red only when too low and white only when too high.

Rules and Practices for Aerodromes (RPA)

A CASA document providing a statement of all the Authority's standards and recommended practices for aerodromes.

Runway (RWY)

A defined rectangular area on a land aerodrome, prepared for the take-off and landing of aeroplanes along its length.

Runway Number

The number allocated to a runway end, being that whole number nearest to one tenth of the magnetic bearing of the runway centreline (measured clockwise from magnetic north) when viewed from the approach. Single digit numbers so obtained are preceded by 0' and where the final numeral of the bearing is 5 degrees, the number allocated is the next largest number.

Runway Strip (RWS)

A defined area including the runway and stopway, if provided, intended: a) to reduce the risk of damage to aircraft running off a runway; and b) to protect aircraft flying over it during take off or landing operations.

Runway Usability

The percentage of time the winds at an aerodrome allow it to be used by aeroplanes with specific limiting cross-wind landing capability.

Take-Off Climb Area

The vertical projection to the ground of the take-off climb surface.

Take-Off Climb Surface

(see Obstacle Limitation Surfaces).

Take-Off Distance Available (TODA)

The length of the take-off run available plus the length of the clearway, if any.

Take-Off Run Available (TORA)

The length of runway declared available and suitable for the ground run of an aeroplane taking off.

Taxiway

A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another.

Taxiway Strip

An area including the taxiway and intended to protect an aeroplane operating on the taxiway and to reduce the risk of damage to an aeroplane accidentally running off the taxiway.

Threshold (THR)

The beginning of that portion of the runway useable for landing. The threshold is the point on the runway from which the LDA is measured.

Transitional Surface

(see Obstacle Limitation Surfaces).

VHF Omni Range (VOR)

A VHF radio navigation aid providing 360 degree radial tracks to the beacon corresponding to the points of the magnetic compass and which may selected at one degree intervals by the pilot.

Visual Approach

An approach by an aircraft to a runway executed by a visual reference to terrain.

Visual Flight Rules (VFR)

Rules of flight to permit operations on a see and be seen basis in visual meteorological conditions (VMC). These rules are prescribed in Part XI of the Civil Aviation Regulations.

Visual Meteorological Conditions (VMC)

Meteorological conditions equal to or better than those specified in the Civil Aviation Regulations and in the Visual Flight Guide.

ABBREVIATIONS

Abbreviations

AA:	Airservices Australia
AATA	Australian Air Transport Association
AGL:	Above ground level
AMSL:	Above mean sea level
ANEC:	Australian noise exposure concept
ANEF:	Australian noise exposure forecast
ANEI:	Australian noise exposure index
ANO:	Air Navigation Order/s
ANR:	Air Navigation Regulation/s
AS:	Australian Standard
ATC:	Air traffic control
ATS:	Air traffic services
BASI:	Bureau of Air Safety Investigation
CAAP:	Civil Aviation Advisory Publication/s
CASA:	Civil Aviation Safety Authority
CASR:	Civil Aviation Safety Regulation/s
CAO:	Civil Aviation Order/s
CAR:	Civil Aviation Regulation/s
DAP:	Departure and approach procedures
DEP:	Department of Environmental Protection (State)
DME:	Distance Measuring Equipment
DOT:	Department of Transport (State)
DoTRS:	Department of Transport and Regional Services (Commonwealth)
EIS:	Environmental Impact Statement
EPA:	Environment Protection Authority
GPS:	Global positioning system
ICAO:	International Civil Aviation Organisation
IFR:	Instrument Flight Rules
ILS:	Instrument landing system
IMC:	Instrument meteorological conditions
INM:	Integrated Noise Model
LSALT:	lowest safe altitude

MDA/H:	Minimum descent altitude/height
MAUW:	Maximum all-up weight
MBZ:	Mandatory Broadcast Zone
MOU:	Memorandum of understanding
MTOM:	Maximum take-off mass
MTOW:	Maximum take-off weight
NDB:	Non-directional radio beacon
NFPMS:	Noise and Flight Path Monitoring System
NM:	Nautical mile
NMC:	Noise Management Committee
NMT:	Noise Monitoring Terminal
OLS:	Obstacle limitation surface/s
PANS-OPS:	Procedures for air navigation services - aircraft operations
PAPI:	Precision approach path indicator
PCN:	Pavement classification number
RESA:	Runway end safety area
RPA:	Rules and Practices for Aerodromes
RPT:	Regular public transport
RWS:	Runway strip
RWY:	Runway
SID:	Standard Instrument Departure
STAR:	Standard Arrival
THR:	Threshold
TKOF:	Take-off
TODA:	Take-off run available
TWS:	Taxiway strip
TWY:	Taxiway
VFR:	Visual Flight Rules
VHF:	Very high frequency (30 - 300 MHz)
VMC:	Visual meteorological conditions
VOR:	VHF omni-directional radio range
WAC:	Westralia Airports Corporation
WAPC:	Western Australian Planning Commission
WDI:	Wind direction indicator