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Port Hedland Airspace Review

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0.1	Initial draft	November 2018
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1.0	Final version incorporating feedback	March 2019
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1 Executive Summary

The *Airspace Act 2007* (Act)[1] provides the Civil Aviation Safety Authority (CASA) with the authority to administer and regulate Australian-administered airspace and authorises CASA to undertake regular reviews of existing airspace arrangements.

The purpose of this review is to evaluate the airspace arrangements within 40 nautical miles (NM) and below Fight Level (FL)180 of Port Hedland Airport (Port Hedland) to determine if the airspace remains fit for purpose[2]. The review period is from the 1 April 2012 to 31 August 2018. The review considered infrastructure issues to be outside of scope.

The methodology used in conducting this review included quantitative and qualitative analysis consisting of:

- Aerodrome traffic data;
- Airspace design;
- Australian Transport Safety Bureau (ATSB) incident data;
- Airservices Australia's (Airservices) Corporate Integrated Reporting and Risk Information System (CIRRIS) data; and
- Stakeholder consultation.

Air transport movements and passenger movements at Port Hedland have decreased by 32.6% and 17.2% respectively during the review period. Between September 2018 and February 2019, there has been an upturn in the resource industry resulting in passenger and traffic numbers increasing as more resource projects are commencing construction in the Pilbara region.

New mining projects in the Pilbara will result in extra flights from Perth and Brisbane commencing in the second half of 2019. Fokker F100 and Boeing 717 aircraft are being replaced by larger Airbus A320 and Boeing 737 aircraft.

Stakeholder feedback focussed on improving efficiency will be forwarded to relevant agencies, CASA staff and Airservices where applicable.

1.1 Summary of Conclusions

- The OAR has determined that the current airspace architecture is fit for purpose.
- Comments from stakeholders suggest the Q9 and Y44 airways configuration causes a cross-over of flight paths when runway 32 is in operation. The crossing arriving and departing tracks happen at 5,000 feet (ft) above mean sea level (AMSL) within 15 NM of Port Hedland.
- There are issues with radio communications between Port Hedland Heliport (YHIP) and Port Hedland, which may be the result of shielding.

1.2 Recommendations

The following recommendations result from CASA's analysis of the Port Hedland airspace:

Recommendation 1: The airspace within 40 NM of Port Hedland is fit for purpose and should remain unchanged.

Recommendation 2: Airservices should monitor the impact of crossing flight paths at approximately 5,000 ft AMSL when runway 32 is in operation.

Recommendation 3: Airservices should investigate the cause of VHF communications issues and implement changes to minimise impact of communication between Port Hedland AFIS, the Port Hedland Heliport (YHIP) and other local traffic.

[1] A full list of acronyms and abbreviations used in this report can be found in Annex A.

[2] For this review, fit for purpose means that the airspace architecture is suitable for its intended purpose.

Table of Contents

2 Introduction

The Office of Airspace Regulation (OAR) within the Civil Aviation Safety Authority (CASA) has carriage of the regulation to administer and regulate Australian-administered airspace, in accordance with section 11 of the *Airspace Act 2007* (Act). Section 12 of the Act requires CASA to foster both the efficient use of Australian-administered airspace and equitable access to that airspace for all users. CASA must also consider the capacity of Australian-administered airspace to accommodate changes to its use and national security. In exercising its powers and performing its functions, CASA must regard the safety of air navigation as the most important consideration.[3]

Section 3 of the Act states that 'the object of this Act is to ensure that Australian-administered airspace is administered and used safely, taking into account the following matters:

a. protection of the environment;
b. efficient use of that airspace;
c. equitable access to that airspace for all users of that airspace;
d. national security.

2.1 Overview of Australian Airspace

Australian airspace classifications accord with Annex 11 of the International Civil Aviation Organization (ICAO) and are described in the Australian Airspace Policy Statement (AAPS). Australian airspace is classified as Class A, C, D, E and G depending on the level of Air Traffic Service (ATS) required to best manage the traffic safety and efficiency. Government policy also allows the use of Class B and Class F airspace. However, these are not currently used in Australia. The airspace classification determines the category of flights permitted, aircraft equipment requirements and the level of ATS provided. Annex B provides details of the classes of airspace used in Australia. Within this classification system, aerodromes are either controlled (i.e. Class C or Class D) or non-controlled (Class G).

2.2 Purpose and Scope

The purpose of the review was to assess the airspace architecture and aircraft activity within a 40 nautical mile (NM) radius of Port Hedland Airport (Port Hedland) extending from the surface to flight level (FL)180. The review was to determine if the airspace complies with the requirements of the Act for safe operations, efficiency and delivers equitable access to all airspace users where possible.

The Review period is from the 1 April 2012 to 31 August 2018.

The scope of the review did not include infrastructure issues raised by stakeholders.

The review process included:

- An analysis of current passenger and aircraft movement numbers;
- A review of forecast air travel demand;
- An analysis of risks based on safety incident reporting from the Air Navigation Service Provider (ANSP) and the Australian Transport Safety Bureau (ATSB);
- An analysis of aircraft operations and traffic mix operating within 40 NM Port Hedland;
- The suitability of the existing Aerodrome Flight Information Service (AFIS) at Port Hedland and if the service is still fit for purpose; and
- An evaluation of the ICAO airspace classifications surrounding Port Hedland based on aircraft and passenger movement numbers.

[3] Civil Aviation Act 1988, section 9A – Performance of Functions

2.3 Objective

The objective of this review was to examine the airspace arrangements and classifications within 40 NM of Port Hedland to determine if the airspace remains fit for purpose.

3 Aerodrome

Port Hedland is a security-controlled, certified aerodrome operated by AMP Capital and is located 5.1 NM South East of the Port of Port Hedland. The aerodrome provides domestic and international passenger transport (PT) services between Perth, Brisbane and Bali. Qantas, QantasLink, Cobham, Virgin Australia, Virgin Australia Regional Airways, Skippers Aviation and Alliance Airlines operate into Port Hedland with regular PT and charter operations. The Royal Flying Doctor Service has a base established at Port Hedland for aeromedical flights. Port Hedland is ranked as the 14th busiest Class G (airspace) regional aerodrome in Australia[3] with 16 PT flights operating per day with several general aviation charter companies operating at the aerodrome.

Located 5 NM north west of the threshold of runway 14 is the port helipad (YHIP). The helipad is operated by the Port Authority to ferry personnel supporting maritime operations.

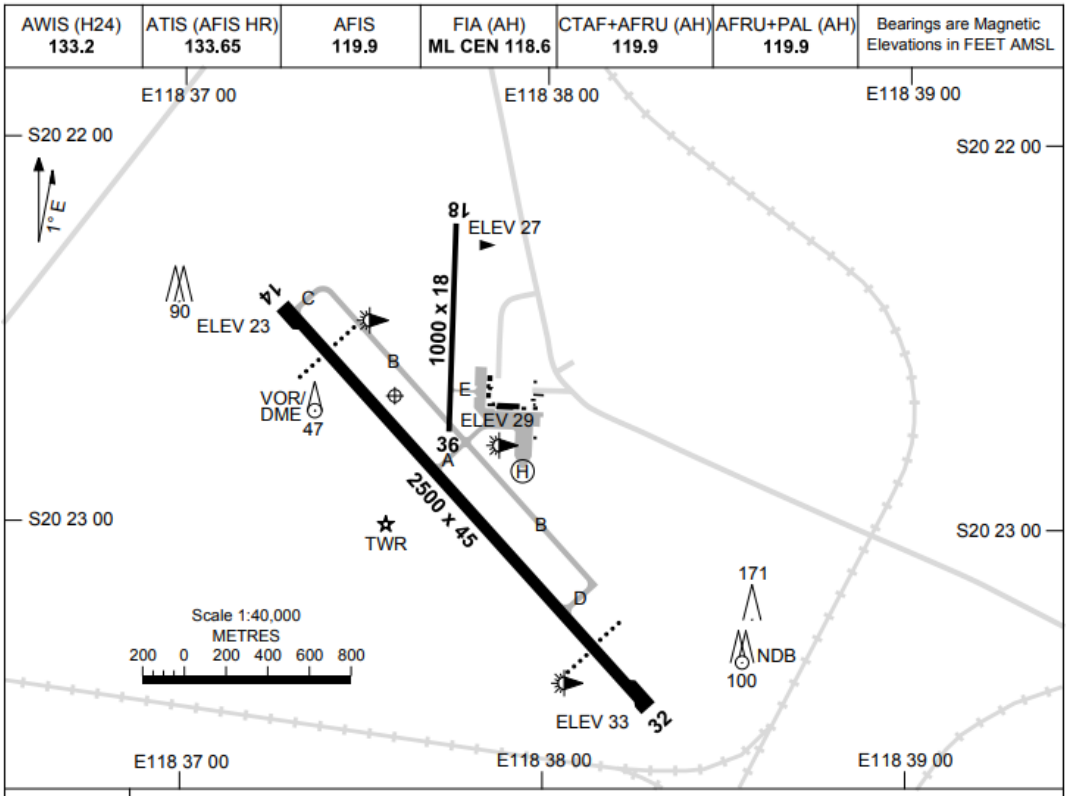

Figure 1: Port Hedland Aerodrome layout (Airservices Australia: *Departure and Approach Procedures Nov 2018*).

3.1 Terminal Instrument Flight Procedures

Port Hedland has Global Navigation Satellite System (GNSS) arrivals as well as Area Navigation (RNAV) and Required Navigation Performance - Authorisation Required (RNP-AR) approaches to runways 14 and 32. Port Hedland also has Very High Frequency (VHF) Omni-Directional Range (VOR) approaches for runways 14 and 32 and a Non-Directional Beacon (NDB) approach for runway 14.

3.2 Aeronautical Information

The En Route Supplement Australia (ERSA) entry for Port Hedland is correct. Feedback from stakeholders indicates there are no known errors on charts.

3.3 Aerodrome Facilities

An AFIS operates from Monday to Sunday at times to suit peak PT traffic. Aircraft operating during hours of PT operations, are required to communicate using the AFIS callsign "Hedland Information" on the Common Traffic Advisory Frequency (CTAF) 119.90 MHz. Pilots are advised of the AFIS operating hours via Aerodrome Terminal Information Service (ATIS) on 133.65 MHz. The AFIS is provided by Airservices Australia (Airservices). Aviation Rescue Fire Fighting Services have also been established at Port Hedland by Airservices.

4 Airspace

4.1 Airspace Structure

Port Hedland is within Class G airspace and is classed as a non-controlled aerodrome. Port Hedland is subject to non-controlled aerodrome procedures. Above the Class G airspace, Class E which commences at FL180 with Class A starting at FL245, refer to Figure 2. A volume of Class E airspace extends to the west of the review area which forms a section of the Karratha Control Area (CTA). This volume of Class E airspace was not assessed in this review.

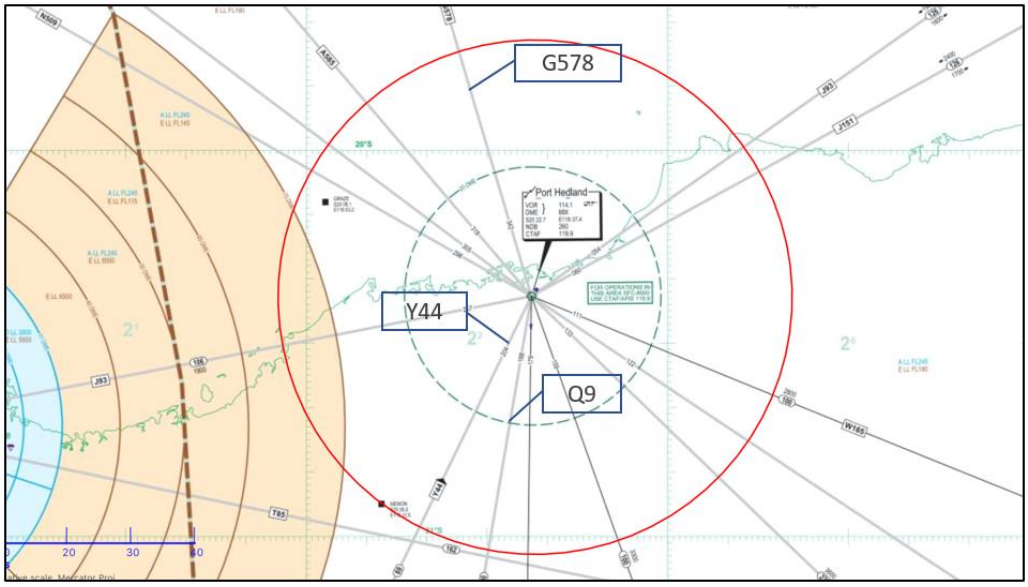

Figure 2: Port Hedland airspace (Karratha Terminal Area Chart, Effective 31 May 2018).

4.2 Restricted and Danger Areas

There are no restricted or danger areas within 40 NM of Port Hedland.

4.3 Air Routes

Fourteen air routes service Port Hedland. Four are international and the remainder are utilised for domestic travel. The busiest domestic air routes are the Q9 and Y44 airways that are inbound and outbound to Perth. The G578 air route is the busiest international air route, which connects Port Hedland to Bali.

4.4 Surveillance

Radar coverage is not available within the vicinity of Port Hedland. An Automatic Dependent Surveillance-Broadcast (ADS-B) ground station is located at Karratha 106 NM south west of Port Hedland which detects appropriately equipped aircraft down to 5,000 feet (ft) above mean sea level (AMSL). ADS-B coverage at 5,000 ft AMSL is shown in Figure 3. A flight following service is not available for aircraft operating under the Visual Flight Rules (VFR) at Port Hedland due to a lack of appropriate surveillance coverage.

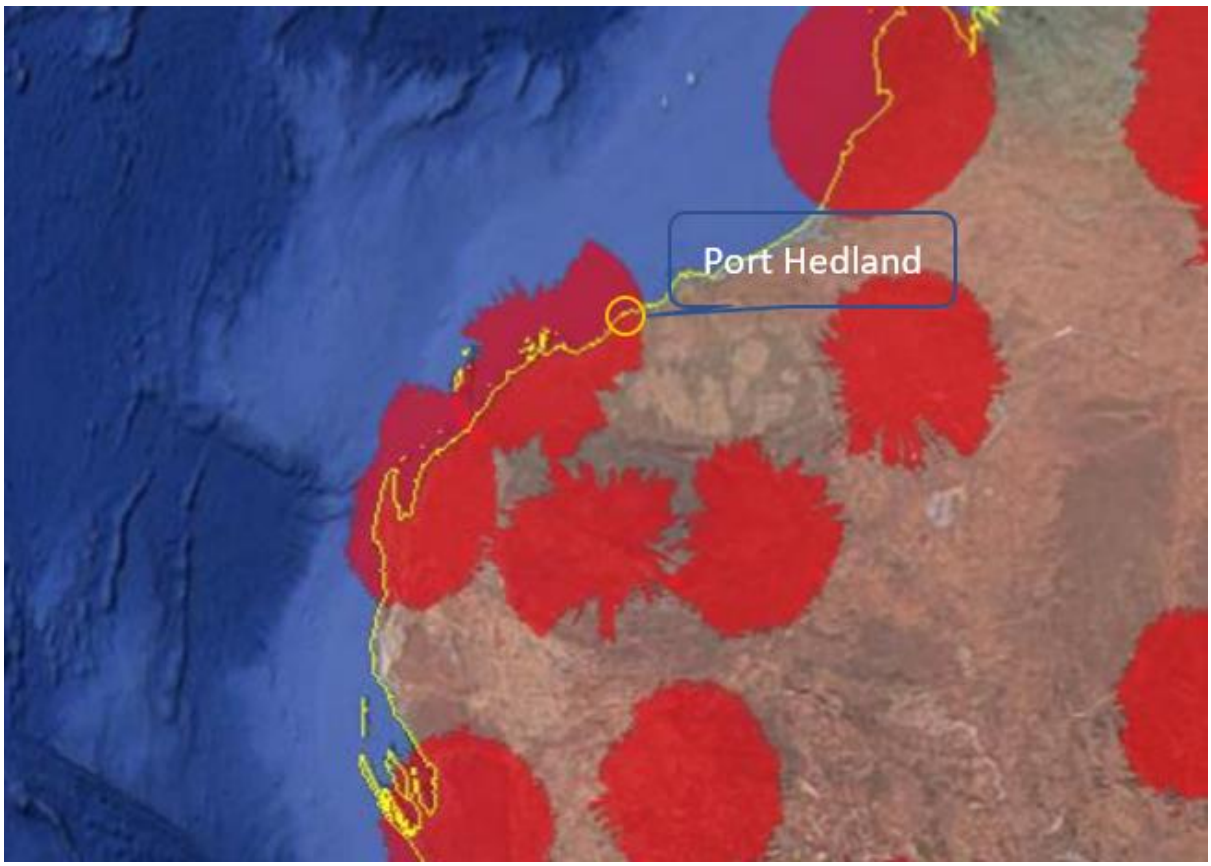

Figure 3: ADS-B coverage at 5,000 ft AMSL (Airservices Australia).

4.5 Environment

The airspace within 40 NM of Port Hedland was reviewed to examine if there are current aircraft environmental issues associated with:

- Noise;
- Gaseous emissions;
- Interactions with birds and wildlife; and
- Environment Protections and Biodiversity Conservation Act 1999 (EPBC Act) items.

The 2012 Port Hedland Airport Masterplan Australian Noise Exposure Forecast (ANEF) indicates no existing communities are expected to be adversely affected by a projected increase in aircraft type or frequency.

No other environmental issues were identified.

5 Traffic

Port Hedland traffic consists of PT and charter services. Most of the passenger movements to Port Hedland support fly-in fly-out (FIFO) and business-related travel. Tourism travel includes one international flight to Bali per week.

5.1 Analysis of aircraft movements

The most current total aircraft movements for the review period at Port Hedland was 11,639. Refer Figure 4.

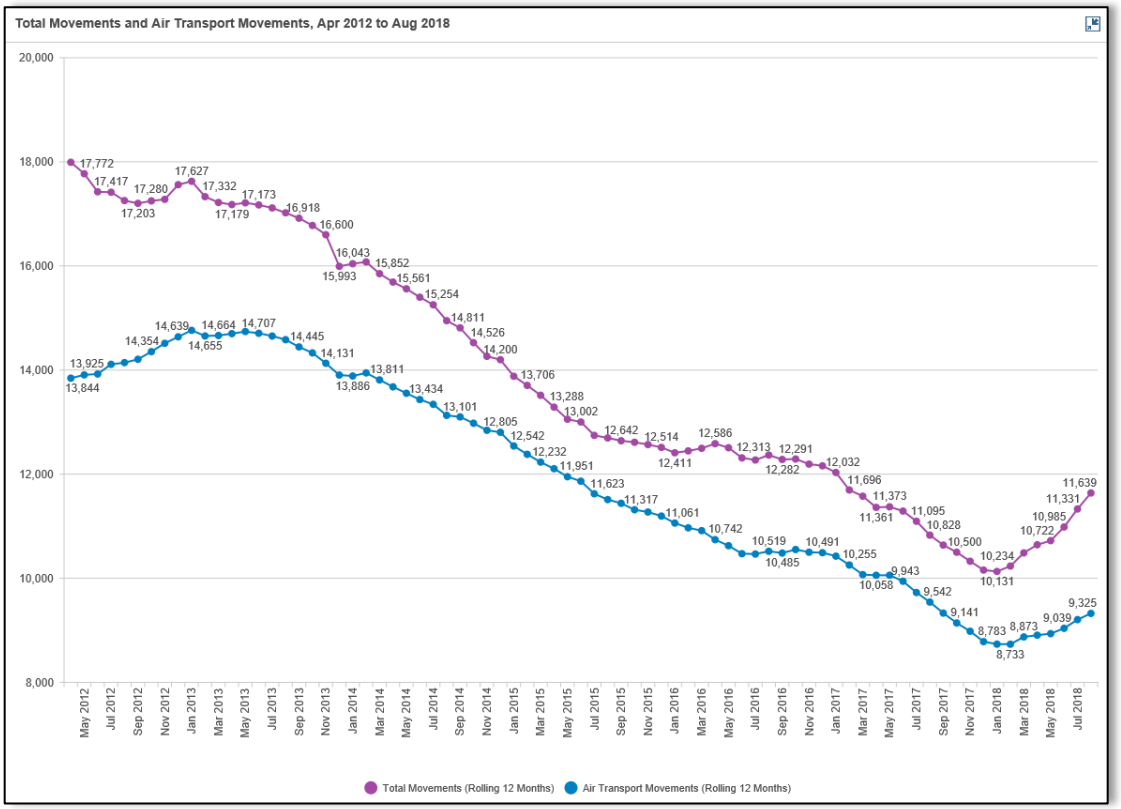

Figure 4: Air Transport Movements

5.2 Analysis of passenger numbers

Total passenger movements for the six-year period at Port Hedland was 420,912 on a rolling 12-month basis. Refer Figure 5.

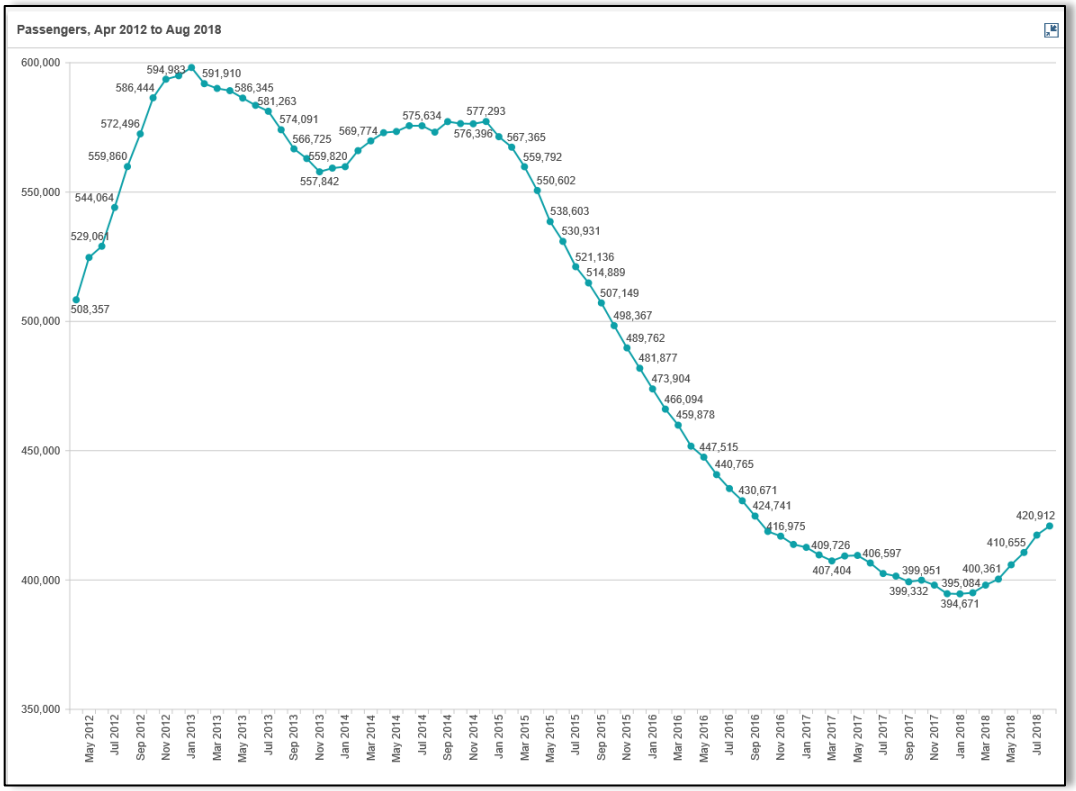

Figure 5: Passenger movements Port Hedland

Industry projects a moderate (3-5%) growth in movements over the next three years. This is generated by an upturn in investment into the Pilbara and North West of Western Australia. The next Port Hedland Masterplan will be released in mid-2019.

6 Aviation Incident Reports

All occurrences involving Australian civil registered aircraft, or foreign civil aircraft in Australian airspace must be reported to the ATSB. These may be events, incidents, serious incidents or accidents. The ATSB receives incident information via pilot reports, Airservices' Corporate Integrated Reporting and Risk Information System (CIRRIS) reports and the Australian Defence Forces' Aviation Safety Occurrence Reports.

The ATSB also maintains a database, the Safety Investigation Information Management System (SIIMS), in which all reported occurrences are logged, assessed, classified and recorded. The information contained within SIIMS is dynamic and subject to change based on additional and/or updated data. Each individual report is known as an Aviation Safety Incident Report (ASIR) and for identification purposes is allocated its own serial number.

CASA receives de-identified ASIR data for the purpose of improving safety. The airspace related incidents within 40 NM of Port Hedland from 1 April 2012 to 31 August 2018 were reviewed to determine any risks to aviation safety.

6.1 ATSB Aviation Safety Incident Reports

There were twelve incidents classified as airspace related from 2012 to 2018. A breakdown of the incidents is listed in Table 1.

Type of incident	Number of airspace attributed incidents						
	2012	2013	2014	2015	2016	2017	2018*
Aircraft Separation	2	3	0	0	0	0	0
ANSP Operational Error	0	1	0	0	0	0	0
Encounter with RPA	0	0	0	0	0	0	0
Operational Non-Compliance	3	5	1	0	2	2	1
Total airspace related Incidents	2	4	1	0	2	2	1
Total aircraft movements	17,562	15,993	14,200	12,514	12,161	10,158	11,639

Table 1: Airspace attributed incidents for Port Hedland 1 April 2012 to 31 August 2018 (ATSB ASIR data).
* 2018 data to 31 August 2018.

6.2 Airservices CIRRIS data

Safety occurrences between 2012-2018 revealed that the average airspace related incidents for Port Hedland is approximately 1 incident in every 3,365 movements. These are summarised below in Table 2.

Type of incident	Airspace attributed incidents						
	2012	2013	2014	2015	2016	2017	2018
Aircraft Accident	0	1	0	0	0	1	1

Aircraft Confliction	1	1	0	0	1	1	0
Other – Safety Related	4	9	4	1	2	1	1
Laser	0	1	1	1	0	0	0
Total airspace related Incidents	**5**	**12**	**5**	**2**	**3**	**3**	**2**

Table 2: Airspace attributed incidents for Port Hedland 1 June 2012 to 31 August 2018 (CIRRIS data).

The review determined that most incidents were reported during AFIS operating hours. This would suggest that airspace related occurrences were identified and reported when the AFIS was active and when the greatest frequency of arrivals and departures were occurring (0600 hours to 2000 hours local time).

7 Consultation and stakeholder feedback

Stakeholders were invited to provide comment on issues relating to Port Hedland airspace. A list of contributing stakeholders to this review can be found in Annex C.

7.1 Summary of feedback from consultation

Stakeholder consultation included information relating to the preliminary airspace review via industry forums. Information received from this process was:

- The AFIS service that Airservices provides at Port Hedland is fit for purpose and functions well as a safety enhancement for traffic arriving and departing at peak times.
- A number of operators suggested that the configuration of the Q9 and Y44 airways created a situation for arriving and departing aircraft to cross-over each other's flight path for runway 32 operations.
- During helicopter operations for pilot (shipping) transfer to ocean vessels, one area of concern is the VHF 119.9 MHz shielding when helicopters are on ground at YHIP. Inbound traffic conducting a 5 NM final for runway 14 make a base turn overhead the helipad.
- New mining projects in the Pilbara will result in extra flights from Perth and Brisbane commencing in the second half of 2019. Fokker F100 and Boeing 717 aircraft are being replaced by larger Airbus A320 and Boeing 737 aircraft. The change in aircraft will result in an increase in passenger numbers, whilst aircraft movements will remain steady.
- The current Class G arrangement is fit for purpose at current traffic levels. It allows economic flexibility for crews with track shortening while providing satisfactory situational awareness and safety by means of the AFIS.

8 Key Issues, Recommendations and Observations

8.1 Issues

Existing arrangement of the Q9 and Y44 jet airways generate a cross-over of flight paths for arriving and departing aircraft for runway 32. Arriving aircraft on the Y44 airway turn right and cross the outbound track on decent to the circuit. Conversely, departing traffic establishing on the Q9 airway turn left and cross the inbound track. Refer Figure 7.

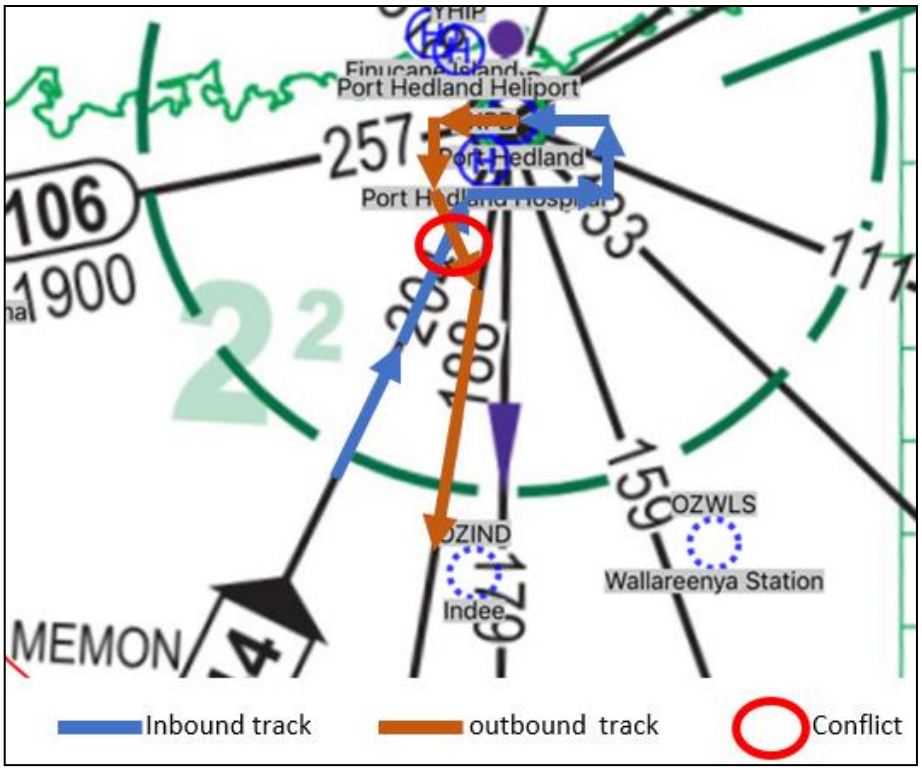

Figure 7: Conflict of inbound outbound tracks for runway 32

VHF transmissions from the Port Hedland heliport to aerodrome are occasionally shielded.

8.2 Findings

Crossing tracks:
Feedback from stakeholders indicated that conflict of inbound and outbound crossing tracks generally occurs at 5,000 ft AMSL when runway 32 is in operation. Comments from airline crews are; although no reportable instances of separation breakdown have happened arriving and departing Port Hedland when runway 32 is in operation, coordination can be complex during peak times. This complexity will only increase as airport demand grows.

VHF communications:
Two separate issues exist with radio communications at Port Hedland;

- Preventing the availability of communication at the heliport with AFIS, and
- Preventing broadcasts from the heliport from being heard by on-ground aircraft at the aerodrome.

This can cause the movements at Port Hedland to be unaware of helicopters departing the heliport.

8.3 Recommendations

The following recommendations are made:

Recommendation 1: The airspace within 40 NM of Port Hedland is fit for purpose and should remain unchanged.

Recommendation 2: Airservices should monitor the impact of crossing flight paths at approximately 5,000 ft AMSL when runway 32 is in operation.

Recommendation 3: Airservices should investigate the cause of VHF communications issues and implement changes to minimise impact of communication between Port Hedland AFIS, the Port Hedland Heliport (YHIP) and other local traffic.

9 Conclusion

The OAR has conducted a review of the airspace 40 NM of Port Hedland.

The review determined that the airspace complied with the requirements of the *Airspace Act 2007 (Act)*, Airspace Regulations 2007, the Australian Airspace Policy Statement (2018), the Minister's Statement of Expectation (2017) and CASA's Regulatory Philosophy.

Mining investment has recently increased in Western Australia with an upturn in the resource industry. Over the past 8 months there has been a 6.23% increase in passenger movements and a 12.9% increase in total aircraft movements. Moderate passenger growth of 3 to 5% is expected over the next three years. It should be noted that new private aviation infrastructure 100 kilometres to the south of Port Hedland may impact aviation activity at Port Hedland International Airport.

An assessment of airspace incidents and feedback from stakeholders concluded there were no safety concerns that required changes to the existing airspace or air traffic service.

The OAR has determined that the current airspace architecture is fit for purpose. The OAR proactively and regularly monitors traffic and incident data. The OAR also engages the aviation community on a regular basis to ensure that the airspace classification and published air routes are safe and efficient.

Appendix 1 Port Hedland airspace description

The airspace within 40 NM of Port Hedland as shown on Figure 2.

- AFIS operates at Port Hedland within 20 NM below 8,500 ft AMSL during peak passenger transport times.
- Class G airspace exists below Class E from the surface to FL180.
- Class E airspace exists above Class G airspace LL of FL180 to FL245.
- Class A airspace with a LL of FL245 overlays Classes E and G airspace.
- No Restricted Areas exist within 40 NM of Port Hedland.
- No Danger Areas exist within 40 NM of Port Hedland.
- No Charted Parachute operations are conducted within 40 NM Port Hedland.
- No Charted Glider charted operations are conducted within 40 NM of Port Hedland.

Annex A - Acronyms and Abbreviations

Acronym/abbreviation	Explanation
AAPS	Australian Airspace Policy Statement 2018
ACP	Airspace Change Proposal
Act	*Airspace Act 2007*
ADS-B	Automatic Dependent Surveillance - Broadcast
AFIS	Aerodrome Flight Information Service
Airservices	Airservices Australia
ALA	Aircraft landing area
ALARP	As Low As Reasonably Practicable
AMSL	Above Mean Sea Level
ANSP	Air Navigation Service Provider
ASA	Aviation Safety Advisor
ASIR	Aviation Safety Incident Report
ATC	Air Traffic Control
ATS	Air Traffic Services
ATSB	Australian Transport Safety Bureau
CASA	Civil Aviation Safety Authority
CCO	Continuous Climb Operations
CDO	Continuous Descent Operations
CIRIS	Corporate Integrated Reporting & Risk Information System
CTA	Control Area
CTAF	Common Traffic Advisory Frequency
CTR	Control Zone
DME	Distance Measuring Equipment
ERC	En Route Chart
ERSA	En Route Supplement Australia
FT	Feet
FL	Flight Level
GA	General Aviation
ICAO	International Civil Aviation Organization
IFP	Instrument Flight Procedure
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
kt	Knot
NOTAM	Notice to air men
NM	Nautical Miles
OAR	Office of Airspace Regulation
PT	Passenger transport
RAPAC	Regional Airspace and Procedures Advisory Committee
RNAV	Area Navigation
RPAS	Remotely Piloted Aircraft Systems
SFC	Surface
TAC	Terminal Area Chart
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
VNC	Visual Navigation Chart
VTC	Visual Terminal Chart

Annex B - Australian Airspace Structure

Class	Description	Summary of Services/Procedures/Rules
A	All airspace above Flight Level (FL) 180 (east coast) or	Instrument Flight Rules (IFR) only. All aircraft require a clearance from Air Traffic Control (ATC) and are separated by ATC. Continuous two-way radio and transponder required. No speed limitation.
B	IFR and Visual Flight Rules (VFR) flights are permitted. All flights are provided with ATS and are separated from each other. Not currently used in Australia.	
C	In control zones (CTRs) of defined dimensions and control area steps generally associated with controlled aerodromes	• All aircraft require a clearance from ATC to enter airspace. All aircraft require continuous two-way radio and transponder. • IFR separated from IFR, VFR and Special VFR (SVFR) by ATC with no speed limitation for IFR operations. • VFR receives traffic information on other VFR but are not separated from each other by ATC. SVFR are separated from SVFR when visibility (VIS) is less than Visual Meteorological Conditions (VMC). • VFR and SVFR speed limited to 250 knots (kt) Indicated Air Speed (IAS) below 10,000 feet (FT) Above Mean Sea Level (AMSL)*.
D	Towered locations such as Bankstown, Jandakot, Archerfield, Parafield and Alice Springs.	• All aircraft require a clearance from ATC to enter airspace. For VFR flights this may be in an abbreviated form. • As in Class C airspace all aircraft are separated on take-off and landing. All aircraft require continuous two-way radio and are speed limited to 200 kt IAS at or below 2,500 FT AMSL within 4 NM of the primary Class D aerodrome and 250 kt IAS in the remaining Class D airspace**. • IFR are separated from IFR, SVFR, and provided with traffic information on all VFR. • VFR receives traffic on all other aircraft but is not separated by ATC. • SVFR are separated from SVFR when VIS is less than VMC.
E	Controlled airspace not covered in classifications above	• All aircraft require continuous two-way radio and transponder. All aircraft are speed limited to 250 kt IAS below 10,000 FT AMSL*, • IFR require a clearance from ATC to enter airspace and are separated from IFR by ATC and provided with traffic information as far as practicable on VFR. • VFR do not require a clearance from ATC to enter airspace and are provided with a Flight Information Service (FIS). On request and ATC workload permitting, a Surveillance Information Service (SIS) is available • within surveillance coverage.
F	IFR and VFR flights are permitted. All IFR flights receive an air traffic advisory service and all flights receive a flight information service if requested. Not currently used in Australia.	
G	Non-controlled	• Clearance from ATC to enter airspace not required. All aircraft are speed limited to 250 kt IAS below 10,000 FT AMSL*. • IFR require continuous two-way radio and receive a FIS, including traffic information on other IFR. • VFR receive a FIS. On request and ATC workload permitting, a SIS is available within surveillance coverage. VHF radio required above 5,000 FT AMSL and at aerodromes where carriage and use of radio is required.

Annex C - Stakeholders

The following stakeholders were contacted to contribute to this review/review. Amend as required

Organisation	Position
CASA	Aerodrome Inspector
CASA	Aviation Safety Advisor
Airservices Australia	Manager Towers North
Department of Transport WA	Principal Policy Officer - Aviation Infrastructure
Port Hedland International Airport	General Manager
Virgin Australia	Head of Operations - WA
Virgin Australia Regional Airlines	Chief pilot
Qantas Airways	Base Manager - WA
Skippers Aviation	Chief Pilot
Network Aviation	Head of Operations - WA
Royal Flying Doctor Service	Deputy Head of Operations
Cobham Aviation 717's	Chief Pilot
Regional Airspace and Procedures Advisory Committees (RAPAC)	Members
Chamber of Minerals and Energy	Manager Economic Competitiveness
Department of Mines and Petroleum	Planning Manager Land Use Planning

Annex D - References

Airservices Australia; Karratha TAC, Effective 31 May 2018 Airservices Australia;

Airservices Australia. Departure and Approach Procedures (DAP) East Amendment 155 Effective 24 May 2018 Airservices Australia;

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