# NSW RAPAC 2019-2

**Venue:** CASA Office, Level 2 Centennial Plaza (Tower A), 260 Elizabeth St Sydney  
**Start Time:** 1300  
**Finish Time:** 1630  
**Date:** Tuesday 28 May 2019  

**Meeting Chair:** Matthew Bouttell  
**Convenor:** Grahame Hill

## MINUTES

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>OPENING</td>
</tr>
<tr>
<td>2.</td>
<td>REVIEW OF ACTION ITEMS</td>
</tr>
<tr>
<td>3.</td>
<td>REGIONAL SAFETY MATTERS</td>
</tr>
<tr>
<td>4.</td>
<td>CHANGE PROPOSALS</td>
</tr>
<tr>
<td>4.1</td>
<td>Amended VFR route in R421AB</td>
</tr>
<tr>
<td>5.</td>
<td>AGENCY BRIEFINGS AND UPDATES</td>
</tr>
<tr>
<td>5.1</td>
<td>Bureau of Meteorology</td>
</tr>
<tr>
<td>5.2</td>
<td>Airservices Australia</td>
</tr>
<tr>
<td>5.3</td>
<td>Defence</td>
</tr>
<tr>
<td>6.</td>
<td>OTHER BUSINESS</td>
</tr>
<tr>
<td>6.1</td>
<td>Restricted airspace for High Intensity Radio Frequency transmissions, Tidbinbilla 13:30</td>
</tr>
<tr>
<td>6.2</td>
<td>Airspace Modernisation Program (Airservices) 13:45</td>
</tr>
<tr>
<td>6.3</td>
<td>Tallawarra Power Station/Wollongong Regional Airport (<em>Out of Session paper – 16 May 2019 &amp; further information provided by Mr John Cleary</em>)</td>
</tr>
<tr>
<td>6.4</td>
<td>JAPAT update</td>
</tr>
</tbody>
</table>
1. OPENING
The Chair welcomed NSW RAPAC members along with those attending the meeting for the first time. It was noted that the NSW and ACT RAPACs would joining via video conference for two agenda items only – 6.1 and 6.2.

2. REVIEW OF ACTION ITEMS
The status of outstanding action items was reviewed with comment included in the attached table.

3. REGIONAL SAFETY MATTERS
There were no regional safety matters raised.

4. CHANGE PROPOSALS
4.1 Amended VFR route in R421AB
SQNLDR Paul Scott presented the attached paper seeking feedback on a proposed change to the existing VFR Route around Nowra. During Discussions one member suggested that ‘Fisherman’s Paradise’ would be difficult to see from the air, however it was also noted that with the use of EFBs, tracking along this route would be made easier. SQNLDR Scott informed the meeting participants that Defence will take onboard the feedback then establish a Request for Change (RFC) – which will include aerial photos of Fisherman’s paradise - to enable more formal consultation on the proposed change to occur.

5. AGENCY BRIEFINGS AND UPDATES
5.1 Bureau of Meteorology
Ms Kerri Barber gave an update on matters relating to the BoM. These are contained within the attachment to these Minutes.

5.2 Airservices Australia
Mr Cristani advised there were nil further updates other than Agenda Items 6.2 and 6.4.

5.3 Defence
SQNLDR Dean Armstrong from Williamstown ATC gave advanced notice of an Airspace review that will soon commence with implementation in late 2021.

SQNLDR Paul Scott advised that Class D was implemented at Nowra and Defence and airspace users were seeing the benefits.
6. OTHER BUSINESS

6.1 CDSCC High Power Operations Implications to Canberra Airspace

The ACT and NSW RAPACs were joined via videoconference.

Ms Cheryl Allman (Landrum & Brown) presented to the RAPAC “CDSCC High Power Transmissions – Stakeholder Briefing & Consultation” to inform members on proposed changes to R430ABC to accommodate increased High Intensity Radiated Field (HIRF) power transmissions from the CSIRO Canberra Deep Space Communication Complex (CDSCC). She noted that CASA, NASA and the FAA have been working together under a bilateral agreement between the US and Australian governments for the purposes of supporting future deep space exploration. Ms Allman also highlighted that the first of the stakeholder consultations being held was on 1 May 2019. Feedback is being sought on the draft airspace volume by 28 June 2019.

Whilst unable to attend the RAPAC meeting, Mr John Hogan (ACT Convenor) asked that his concerns regarding the late involvement of RAPAC be communicated at the meeting and recorded in the minutes. Ms Allman emphasised that this is the beginning of the consultation process and noted that a stakeholder risk workshop was conducted on 1 May 2019 which helped to inform the draft airspace design. There will be a series of consultations with industry prior to the Airspace Change Proposal (ACP) being developed and the airspace is unlikely to be established for another three to five years. The RAPACs will continue to be engaged in this process, and members can contact Ms Allman directly for further discussion.

Mr Stewart Dennis (HGFA) enquired whether the operation of the HIRF will restrict cross-country flying. The RAPAC were informed that the Restricted Area (RA) is being designed to ensure that there will be limited risk to flights in the area, but airspace users would need to remain outside of the airspace. If for some reason, an aircraft enters the RA, then there is an emergency procedure activation process which would take appropriate action including shutting off the transmission. However, the transmission will not be shut off if there are mission critical events taking place, e.g. Providing communications for manned space missions.

Mr Jeff Hunt (Regional Express – NSW RAPAC) highlighted potential issues that will be faced by Rex with their Sydney – Albury routes and enquired about individuals and aircraft equipment experiencing multiple exposures by the HIRF. Ms Allman acknowledged that the team was aware of the issues of the Sydney-Albury route and that Airservices had already commenced work on alternatives. Mr Hunt advised that due to the age of the REX Fleet they may not have the required shielding to alleviate the effects of the HIRF. Ms Heather Selwyn (Landrum & Brown) stated that the concern for human exposure is related to heating effects on the body. After a short period, likely minutes, the exposure is reset and therefore there is minimal risk to crew who are frequently flying these air routes. She also stated that aircraft equipment would be unaffected if there is sufficient shielding in place for the avionics and that the aircraft are certified for repeat exposure. Ms Allman requested REX to provide aircraft technical details to enable further understanding of the certification levels of the aircraft avionics. The meeting was informed that a focus of the project team has been to reduce the impact on airspace users by developing a volume that will accommodate high level, high speed operations that will not be affected by HIRF. There is potential for the opportunity to further reduce the airspace volume, vertically, if other procedures are able to be accepted by the aviation agencies and airspace users. There is more work to be done on this topic.

Ms Allman also informed the RAPAC that the decision for the airspace to be RA2 or RA3 is yet to be decided. The objective at this stage is to only allow emergency aircraft to safely access the airspace in accordance with predetermined procedures, however this will be reliant upon the further work to be done as discussed above.
Written feedback to the draft airspace volume is requested to be provided by Friday 28 June. Details of how to submit feedback are contained within the technical paper and summary presentation.

6.2 Airspace Modernisation Program (Airservices)

The ACT and NSW RAPACs were joined via videoconference.

Mr Adrian Fitzgerald (Airservices) presented on Airservices’ Airspace Modernisation Program – Tranche 3 (attached). He outlined the proposed changes including, but not limited to Class E above regional terminal airspace, Class G in terminal airspace out of tower hours, and lower Class E airspace at Ayers Rock. The changes are proposed to occur at May 2020 AIRAC. Mr Fitzgerald also noted that CASA is consulting on the ACPs until 23 June 2019.

6.3 Tallawarra Power Station/Wollongong Regional Airport

The Chair introduced this agenda item by noting the distribution paper had been distributed out of session prior to the RAPAC meeting as a result of the Airspace Change Proposal Process, with the intention for it to be included for discussion at this meeting. The Chair also noted that the consultation currently being undertaken by the Office of Airspace Regulation (OAR) was standard process to seek feedback on the solution put forward by the proponent, not the OAR.

Mr Alex Dallwitz (CASA/OAR) spoke to the attached paper noting the intention to seek industry feedback regarding on whether safety issues existed with relation to Energy Australia’s proposal. It was highlighted that the OAR had identified 19 Danger Areas around Australia for plumes and that it was not unusual to receive an ACP for this purpose. However, there was no precedent in terms of the relative location of this Danger Area to Wollongong Aerodrome. Mr Dallwitz informed the meeting participants that should they wish to respond to the consultation they will need to specify why it is not safe what the effects are.

Mr Ken Allcott (Sydney Airport) informed members that Sydney airport used the FAA approved model. This plume analysis model, owned by the Mitre Corporation, quantifies the impact of the plume. This was acknowledged by Mr Dallwitz.

Mr Julian Turecek (Energy Australia) gave a presentation (attached) to outline the proposal. During this presentation Mr Joel Sinclair (YWOL Airport Manager) disputed the claim by Energy Australia in the presentation that there were other airports, including Oakey, with similar Danger Areas. Mr Turecek did not support Mr Sinclair’s views. Mr Turecek informed the meeting that the power station would likely only operate during peak times, being morning and afternoons. During further discussion with members Mr Dallwitz informed the meeting that there are no vertical buffers applied to the upper limit of the DA.

Mr Jeff Boyd (Corporate Air) asked Mr Turecek whether any analysis had been performed on IFR flight paths and that he had been informed that it will raise the minima for the RWY16 instrument approach by up to 300 feet. Mr Turecek could not confirm whether this was the case at that time. Mr Turecek sought information from colleagues and was able to subsequently inform the meeting that there would be nil affect and that the existing 1340’ decision altitude would still apply.

Mr John Cleary (SAAA) noted that whilst the modelling conducted by OAR to-date had indicated moderate turbulence, this equated to Severe turbulence for aircraft operating under RAAUs.

Mr Powel Davidyuk (Aviation Projects) whom is providing consulting services to Energy Australia suggested that the circuit is not affected by this power station and that controls in addition to the
DA would also be implemented such as lights indicating the location and operations of the power station.

Another presentation (attached) was given by Mr Joel Sinclair (YWOL Airport Manager) to outline significant concerns from the airport operators, Shellharbour city council. This was supported by Ms Cheryl Lappin (Shellharbour City Council) who informed the meeting that the power station was being proposed outside of the current approvals and that any power station must not impact aviation safety. Ms Lappin claimed that the proposed DA does not meet that condition as it acknowledges that a safety issue exists. Ms Lappin put forward that Council does not want any constraints on the airport and that Council does agree that a closed cycle power station will meet the current approvals. Ms Nicole Ashton (Wollongong City Council) informed the meeting that the proposed power station would be located in Wollongong City Council area and that they have significant concerns about the safety of new residential developments as a result of the plume.

During the presentation Mr Sinclair suggested to CASA OAR that aircraft type needs to be considered when modelling the effects of the plume. It was also highlighted that due to the mix and density of air traffic that the circuit area is different to that of a standard circuit as presented by Mr Turecek.

Mr Philip Ayrton (Illawarra Flyers) supported the proposition made by Mr Sinclair regarding the circuit size and location at Wollongong as a result of differing aircraft performance, student pilots still learning and at times the need to hold over the lake due to traffic patterns and congestion.

Mr Sinclair also highlighted that this proposal is vastly different to the other three airports put forward as examples by Energy Australia.

Mr Sandy Howard (HARS) outlined the process of conducting an engine out departure from RWY34 in one of the typical HARS aircraft. It was explained that a pilot would climb to 500’ then make a right turn climbing out to the east to 800’ and would possibly fly through the plume. He also noted that due to the aircraft performance, circuits are conducted at 1500’ and therefore this would place you over the plume whilst descending. Mr Howard supported the claim that as traffic increases, so does the circuit size and therefore it would likely place aircraft over the plume.

Mr Benjamin Morgan (AOPA) outlined that AOPA was concerned with the application and that it sets a national precedent with wide ranging implications. AOPA was interested in understanding the safety implications and highlighted the impact of these types of developments, particularly, on the training sector.

Mr Cleary advised that he had significant safety concerns about this proposal and that the Danger Area does not mitigate the risk associated with the plume. Mr Cleary then moved a motion for the NSW RAPAC to not support this proposal. This motion was supported by Benjamin Morgan with there being general consensus amongst NSW Industry members to not support this proposal.

The Chair noted that the proponents for the Danger Area including those from Energy Australia and Aviation Projects, did not support the motion.

The Chair noted the abstention of the representatives from Defence, CASA, Airservices Australia and the Bureau of Meteorology.

The Chair and Industry Convenor agreed that a majority supported the motion and therefore the advice to CASA OAR regarding this proposal is that the **NSW RAPAC does not support the establishment of a Danger Area nor to locate an Open Cycle Gas Turbine at the location proposed by Energy Australia.**
Note from Chair:
The RAPAC Terms of Reference under 2. Scope and Authority outlines that: “As a consultative forum, RAPAC may only provide advice, general comment and make recommendations. The committee does not have authority to regulate or make determinations on matters under discussion, regardless of the authority of any individual member.”
The Chair also notes that under RAPAC TORs 4.4 Meeting Procedure and Operation that: “…if there is any issue where consensus cannot be reached, the resolution or recommendation may note representatives’ dissention or abstention to the majority view.”

6.4 JAPAT update
Mr Jeff Cristani updated the meeting that there would now be two departure corridors for Bankstown Northern, as an outcome of the JAPAT, plus western corridor.
Airservices will coordinate working group to be established outside of the RAPAC to work on these matters. RAPAC will be kept informed.

7. ATTENDANCE LIST

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matthew Bouttell (Chair)</td>
<td>CASA</td>
</tr>
<tr>
<td>Grahame Hill</td>
<td>ACT Convenor</td>
</tr>
<tr>
<td>Jeff Cristani</td>
<td>Airservices Australia</td>
</tr>
<tr>
<td>Adrian Fitzgerald</td>
<td>Airservices Australia</td>
</tr>
<tr>
<td>David Nye</td>
<td>Airservices Australia</td>
</tr>
<tr>
<td>Benjamin Morgan</td>
<td>AOPA Australia / AGAA</td>
</tr>
<tr>
<td>Powel Davidyuk</td>
<td>Aviation Projects</td>
</tr>
<tr>
<td>Mark Fitzsimmons</td>
<td>Blue Sky Helicopters</td>
</tr>
<tr>
<td>Kerri Barber</td>
<td>Bureau of Meteorology</td>
</tr>
<tr>
<td>Brad Parker</td>
<td>CASA</td>
</tr>
<tr>
<td>Leonard Yates</td>
<td>CASA</td>
</tr>
<tr>
<td>Alex Dallwitz</td>
<td>CASA/OAR</td>
</tr>
<tr>
<td>Jeff Boyd</td>
<td>Corporate Air</td>
</tr>
<tr>
<td>Shane Doyle</td>
<td>Defence / Holsworthy</td>
</tr>
<tr>
<td>David Carter</td>
<td>Defence / Holsworthy</td>
</tr>
<tr>
<td>Paul Scott</td>
<td>Defence / NWA ATC</td>
</tr>
<tr>
<td>Dean Armstrong</td>
<td>Defence / WLM ATC</td>
</tr>
<tr>
<td>Bill Smith</td>
<td>Energy Australia</td>
</tr>
<tr>
<td>Julian Turecek</td>
<td>Energy Australia</td>
</tr>
<tr>
<td>Sandy Howard</td>
<td>HARS</td>
</tr>
<tr>
<td>Robert Dicker</td>
<td>HCAPA</td>
</tr>
<tr>
<td>Philip Ayrton</td>
<td>Illawarra Flyers / SAAA</td>
</tr>
<tr>
<td>Joseph Jiah-Jieh Liao</td>
<td>Independent</td>
</tr>
<tr>
<td>Jeff Hunt</td>
<td>Regional Express Airlines</td>
</tr>
<tr>
<td>Andrew Messor</td>
<td>Regional Express Airlines</td>
</tr>
<tr>
<td>John Cleary</td>
<td>SAAA</td>
</tr>
<tr>
<td>Cheryl Lappin</td>
<td>Shellharbour City Council</td>
</tr>
<tr>
<td>Joel Sinclair</td>
<td>Shellharbour City Council (YWOL Airport Manager)</td>
</tr>
<tr>
<td>Name</td>
<td>Organization</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Ken Allcott</td>
<td>Sydney Airport</td>
</tr>
<tr>
<td>Forrest Shore</td>
<td>Sydney HeliTours</td>
</tr>
<tr>
<td>David Binskin</td>
<td>Sydney Metro Airports</td>
</tr>
<tr>
<td>Nicole Ashton</td>
<td>Wollongong City Council</td>
</tr>
</tbody>
</table>
### Reference | Action | Responsible | Due Date | Status |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-1/1</td>
<td>Matter: change of airspace in the vicinity of Bondi 5. Out of session discussion to be held with CASA, Airservices and operators.</td>
<td>Chair CASA (Yates) &amp; Chair</td>
<td>Out of session</td>
<td>In-progress. At RAPAC meeting 2018-3 CASA advised the meeting that an airspace change request (ACP) was in progress relating to the changing of airspace in the vicinity of Bondi 5. Over the next 1-2 months it is expected that an outcome from the ACP will be forthcoming. CASA (Yates) to provide further information including a diagram when available. 2018-3 update: matter still in-progress as it needs to be consider further due to the complexity of the request. CASA wants to ensure everything is equitable for all airspace users. 2019-1: CASA (Yates) advised that an ACP will be developed to adjust the Class C SFC-500' eastern boundary BTN Maroubra and Ben Buckler to follow the coast for helicopters. See 2019-1 Minutes for diagram. This will enable greater access for helicopters to the Bondi 5. Chair to arrange an out of session discussion with CASA, Airservices and operators to progress. Update to be provided at 2019-2 RAPAC. 2019-2: CASA presented a possible solution to facilitate helicopter movements BTN South Head and Maroobra. Further advice is required from Airservices to determine if this solution (as attached) will be acceptable. Mr Yates to continue with the development of the proposed solution out of session.</td>
</tr>
<tr>
<td>2019-1/2</td>
<td>Airservices to advise what transponder requirements are proposed for Gliders in relation to the changing of vertical airspace boundaries associated with the Airspace Modernisation Project.</td>
<td>Airservices</td>
<td>Out of session</td>
<td>Closed: Airservices advised that the national lowering of Class E airspace to FL125 and Class E steps to 5,500ft AMSL at Ayers Rock will have the same rules for glider transponder requirements as they do today. The AMP will not require changes to the current AIP requirements (AIP GEN 1.5-12, Section 6)</td>
</tr>
<tr>
<td>2019-1/2</td>
<td>Airservices requested to provide a copy of the Airspace Change Proposal (ACP) submitted to CASA regarding the Ayers Rock airspace change.</td>
<td>Airservices</td>
<td>Out of Session</td>
<td>Closed: CASA is conducting a separate consultation in relation to this matter. The required information is contain at this location: <a href="https://consultation.casa.gov.au/stakeholder-engagement-group/class-e-ayers-rock/">https://consultation.casa.gov.au/stakeholder-engagement-group/class-e-ayers-rock/</a></td>
</tr>
</tbody>
</table>
BONDI 5 - SOUTHBOUND
At ALT not above 1,000FT TR from Sydney Heads E of the coast to Ben Buckler (northern headland of Bondi Beach); descend to 500FT by Ben Buckler; thence TR E of the coast to Long Bay headland (southern headland of Maroubra Beach); ALT 500FT. If intending to land at SY Airport contact SY Tower 124.7 approaching Maroubra Beach.

BONDI 5 - NORTHBOUND
TR E of the coast from Long Bay headland (southern headland of Maroubra Beach) to Ben Buckler (northern headland of Bondi Beach); ALT 500FT; thence climb to not above1,000FT and remain E of the coast to Sydney Heads.

Special procedures for use with BONDI 5
The following should be noted in relation to BONDI 5:
A. The route is designated principally for single engine HEL. Delays may occur when RWY 07 is in use for DEP, or RWY 25 for ARR at YSSY Airport; and
B. The route is not AVBL in either direction when RWY 16 PRM approaches are being conducted at YSSY Airport; and
C. In addition to the ATC FREQ, pilots should maintain a listening watch on 120.8 for information on traffic operating on route VICTOR ONE (V1).
Class G
SFC-500

Release of
SY CTR
to the coast
Bureau of Meteorology Update

NSW RAPAC
Presented by Kerri Barber
Topics

• Aviation Meteorological Services Transformation (AMST) Update
• TAF Review
• Trend (TTF) Review
• Use of PCA locations in SIGMETs
• Change in AWIS phone numbers
AMST - Background

Current operations
- Forecasters are generalists
- Forecasting delivered from 11 different offices

Key issues:
- Service improvements are difficult/slow to implement
- Workload managed within offices
- Experienced forecasters specialise, but there is no aviation option.

Future service demands
- Industry trends
  - Growth in air movements
  - Global operations and sourcing
  - Multinational weather corporations
- Future services
  - Digital and graphical meteorological information, in cockpit
  - Air Traffic Flow Management, OneSky
  - Regional Hazardous Weather Advisory Centres (VAAC, TCAC)
<table>
<thead>
<tr>
<th>Quality</th>
<th>Responsive</th>
<th>Resilient</th>
<th>Flexible</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dedicated aviation specialists with a deep understanding of the industry</td>
<td>• Service improvements faster due to consolidation of people and ICT</td>
<td>• Two aviation centres underpin continuity; structured training and smart technologies to strengthen and deepen local aviation knowledge</td>
<td>• Operations that efficiently scale to tactical loads and accommodate service expansion, including new and expanded services</td>
</tr>
</tbody>
</table>
AMST - Technology Uplift

• Operating environment:
  – simpler, swifter, robust

• Improved Tools
  – Flexible workload
  – Intelligent alerts
  – Situational awareness

• Training / Learning
  – Knowledge-base
  – Immersive simulator
AMST - Timeline

Ongoing stakeholder management, communication management, risk & issue management, quality & assurance management and change management.

**Programme Management**
- Dec '17: Programme Management Plan

**Systems and Technology**
- Dec '18: Training environment available
- Apr '19: Brisbane centre functional
- Jun '19: Melbourne centre functional
- May '20: Forecasting tool suite functional

**People and Services**
- Feb '18: Recruitment Strategy
- Oct '18: Aviation Mgt Organisational redesign
- Jun '18: Implementation Plan
- Dec '18: Recruitment complete
- Jul '19: Brisbane centre operational
- Jan '19–Jul '19: Service transition to Brisbane-Cairns, NT, north WA
- Nov '18–May '20: RAWS transition training
- May '19–May '20: Service transition to Melbourne – NSW, SA, SA, WA, TAS
- Jun '20: National centres operational

**FY 2017/18**
- Q1
- Q2
- Q3
- Q4

**FY 2018/19**
- Q1
- Q2
- Q3
- Q4

**FY 2019/20**
- Q1
- Q2
- Q3
- Q4

**Jun '20**
- End Programme Report
More information:

Aviation Weather Services

Contact us on:
Aviation_Transformation@bom.gov.au
TAF Review

- **Purpose:**
  - Determine the current and future needs of the aviation industry.
  - Make recommendations relating to the provision and categorisations of TAFs.
  - Quality management.

- TAF Review Executive Committee and Technical Working Group, consisting of members from Bureau, Airservices, CASA and DOIRDC to meet in June.
A TAF3 Implementation working group (TIWG) was established on 30 April 2019 consisting of a broad representation from industry and government agencies.

It has been decided that an implementation date of 21 May 2020 is achievable to cease TTF and commence TAF3.

CASA is aiming to commence the consultation process regarding changes in June 2019.

Our timeline aims to have all regulatory drafts finalised by October 2019.

Training of aviation forecasters and pilot-industry awareness education is expected Feb-April 2020.
Use of PCA locations in SIGMETs

- Australian SIGMETs currently include PCA locations and/or geographical coordinates for describing the location of phenomena (as per registered difference in ICAO Annex 3).

- This is posing more significant issues as we are moving towards machine to machine ingestion of Operational Meteorological (OPMET) Information in digital format.

- This will become the future ICAO standard.

- To comply with these ICAO requirements, the Bureau will be transitioning to using only geographical coordinates in all Australian SIGMETs – possible implementation Nov 2019.
From 15 August 2019, there will be changes to all AWIS phone numbers.

These new numbers will be updated in all Airservices documentation including the ERSA and will also become available at [http://www.bom.gov.au/aviation/location-info/](http://www.bom.gov.au/aviation/location-info/).

There is the possibility that the old and new AWIS phone numbers will be operated in parallel between 15 August and 30 September – to be confirmed...
Questions and comments
Avn_Regional@bom.gov.au
CDSCC High Power Transmissions – Stakeholder Briefing & Consultation

- Project Background
- DSN & HIRF
- HIRF Safety Impacts
- Current Airspace
- Proposed Change
- RA Concept Development
- Assessment Process
- Stakeholder Consultation
- ACP

May, 2019
NASA's Deep Space Network (DSN) has 3 Communication Complexes:
  - Madrid DSCC - Robledo Spain
  - Goldstone DSCC - California USA
  - Canberra DSCC – ACT Australia

Comms with approx 35 spacecraft including Voyager 2.

CDSCC’s operational antennas produce high intensity radiation fields (HIRF).
Strategically significant for Australia.
Continuous ‘follow the sun’ operations
R430 currently protects for HIRF from:
- 34m dish @ 20kW on S- and X-bands, and
- 70m dish @ 100kw on S-band & 80kw on X-band

Transmissions have a minimum elevation of 10°
- R430A: SFC – A035, 2.0nm Radius
- R430B: A035 – A045, 3.0nm Radius
- R430C: A045 – A100, 5.0nm Radius
- RA2 – Entry via coordinated Request

2017 CASA Post Implementation Review:
- Confirmed acceptability and added interim step (R430B) to maximise low level airspace access.
- Changed status to RA2 to facilitate emergency operator access
NASA Higher Power Requirements

Communication with Mars missions (including manned), and continuing Voyagers require higher power

80kW X-Band transmitter on 34m dish required by NASA at all 3 DSCC locations

Operating Requirements:
- Elevation minimum 13.5°
- Azimuth 360°
- 24/7 and 365 days per year

Result:
- Increased HIRF field strength on X-Band up to 316V/m peak.
HIRF Safety Implications

- **Flight Critical Systems**
  - Electronic Systems (e.g. widely used in avionics, engine control & navigation systems) can be vulnerable to HIRF
  - HIRF interactions with Electronic systems are complex

- **Certification Level (Env 1 = 200V/m for X-band)**
  - Flight critical functions must be shown to be immune / resilient to HIRF environments up to certification levels
  - Functional Resilience – must be able to withstand the HIRF test levels without adverse impact

- **History / CASA Assessment**
  - To date, known cases of HIRF adverse impact are few and mainly anecdotal, none fatal
  - No cases of RPT aircraft affected – A330 level change incident at Learmonth: investigation ruled out HIRF as trigger

- **Human Exposure**
  - ARPANSA Public Exposure Limit reached after 43s @ 200V/m, 13s @ 316V/m continuous exposure hovering in the beam.
Maximum HIRF 34m 80kW X-Band field strength is 316V/m:

- < “peak” limit in Env 1 (1,000V/m)
- > “time average” limit in both Env1 (200V/m) and Env 2 (170V/m)
- Application of the Peak 316V/m unnecessarily restricts a significant chunk of airspace up to approx. FL515.

NASA (JPL) / DSC have developed “spatial averaging” which takes account of the reduced exposure time due to the speed of the moving target (aircraft):

- The FAA and CASA have approved the methodology
- CSIRO have utilised the methodology to calculate RA dimensions required for 79kts (min) ground speed to ensure average HIRF exposure remains < Env 1.
Factors affecting beam transit time:

- Ground Speed
- Transit angle: combinations of (climb/descent) & beam angle (elevations)
- Turn through beam (insignificant)
- Min elevation mask primarily determines low level airspace
- Lateral RA dimension dominated by far field drop off.

Example:

- 79kt GS
- Climb at 8°
- Minimum Beam elevation 13.5°
- RA up to FL250 (dependent on buffer to be applied)
- Assumption: ACFT above FL250 >79kts ground speed
• Deterministically Safe by Design – RA430xx designed to exclude all airspace users from potential HIRF Event (HIRF Event = 1s avg exposure > 200V/m);

• Historical Lowest ground speeds above elevation mask (79kts) identified and used as basis for design;

• Conservative Assumptions (e.g.79kts GS and @ 8° climb / descent)

• As with any RA, pilot compliance / avoidance required;

• ATC Monitoring of Class A & Instrument Flights;

• Additional Barriers:
  • Entry into RA does not automatically mean HIRF exposure (narrow beam in large volume);
  • HIRF Event does not automatically result in Flight Critical System Failure
  • Standard Equipment Failure Response
HAZID & Risk Assessment

Hazard Register has been developed & input to be provided by stakeholders.

Scenarios will be developed into Bowties.

Safety controls (preventative & mitigative) identified and ranked in terms of effectiveness (probability of failure).

Qualitative / Semi-Quantitative assessment of residual risk for all identified consequences.

Validation of identified controls – e.g. Shutdown coordination, Compliance with RAs, Transmission Power control.
RA430xx Development Stages

- CSIRO gained approval from FAA & CASA to utilise spatial averaging methodology to develop an airspace concept;
- AirServices have had input to the initial concept design to ensure feasibility - e.g. current airspace users, minimum GS & possible RA implications;
- Draft Hazard Register with consultation from key Stakeholders;
- Safety Assessment to be developed in support of ACP for CASA review & approval;
- Detailed design of RA430xx to support high power transmissions;
- RA430xx Published, activated by NOTAM to support construction, commissioning;
- RA430xx active - Operation of 80kW transmitter.
Airspace Design & Safety Assessment Process

1. Early Concept Design Review – Stakeholder Input
2. Detailed Design Developed
3. Airservices Airspace Assessment & Consultation
4. ACP Review, Approval & RA430xx Activation (by 2022)
5. HAZID developed – incl Stakeholder Input
6. HAZID scenarios developed into Bowties
7. Safety controls ranked in terms of effectiveness (probability of failure)
8. Residual Risk Assessed
9. Validation of critical controls
10. Safety Assessment Report Approval
Stakeholder Consultation Processes

Opportunities (stages)
- Draft Concept Discussion & Hazard Register Review meeting
- ACT & NSW RAPACs May 2019
- Direct Communication with L&B representatives
- Future RAPAC meetings
- Analysis of stakeholder feedback
- Final airspace design for ACP
Impact on Low Level Class G Airspace

- 10° elevation mask (existing transmissions) supports low power operations
- No anticipated changes to existing lower limits of R430 A-C for high power operations
- Possible overlay of 2(?) extra tiers from A090 up to FL250
Based on input from stakeholders, proposed RA will be assessed by Airservices.

Necessary Flight Track changes (& options) will be identified.

Any Flight Tracks changes will go through the full Airservices consultative process.
Stakeholder Workshop – Key Feedback

• Draft HAZID register reviewed, added to & verified
• Proposed Step at 6.5nm, A090–FL120 needs input from other potential airspace users
• High sensitivity to additional track miles – all options to be assessed including the economic impact
• 8° climb or descent is conservative
• 79kts GS (for ops above elevation mask) is conservative
• Speed requirement on tracks through RA requested - pilot responsibility to manage during planning phase
• RA design buffers, rounding and addition of operating buffers conservative
• RA2 – definitions and applications in practice need review
For feedback and comments on this work, please contact:

Cheryl Allman, ACP Project Lead
E: CAllman@landrum-brown.com

Feedback is requested by 4pm Friday 28 June 2019
Aim of today’s presentation

PART 1
Explaining what Tranche 3 of the AMP is and the change detail

PART 2
Questions and answers
The ever changing ATM environment

- Changes to technology (eg Performance based navigation)
- Mandated avionics (eg IFR ADS-B mandate)
- Changes to the ATM platform capability (eg CMATS)
- General aviation expectations (eg VFR access)
- New airspace users (eg Drones, RPAS)
- Changed government expectations (eg Airspace Policy Paper)
- Differing international practice (eg FAA airspace)

- Emerging airports (eg Western Sydney)
- Emerging services (eg Ballina)
- New runways (eg Brisbane and Melbourne)
- New service offerings (eg Digital aerodrome services)
- Enhanced surveillance (eg Satellite ADS-B)
- Modernised communications (eg SATCOM)
- New aircraft capability (eg increased velocity, altitude, range)
PART 1
Airspace in context

- Air Traffic Flow Management • Enabling a predictable air transport network
- Air Traffic Control • Delivering safe and efficient services
- Airspace Management • Setting the platform for effective Air traffic Management (ATM)

Airspace Modernisation Program – Tranche 3
AMP Changes roadmap

1.0 5 Tower’s Transfer of Airspace to Enroute

May 2019  CP2 CP3 CP4

SO2

2.1 Increased Enroute Class E & C Airspace

November 2019  CP1 CP2 CP3 CP4

SO1

CP1. The class of airspace should be commensurate with the service level required to appropriately manage the assessed level of risk

CP2. There should be national consistency and standardisation of airspace and procedures to reduce complexity for air traffic controllers and pilots and enhance service resilience

CP3. The class of airspace should leverage the implementation of air traffic management technologies (such as ADS-B surveillance) to improve safety, mitigate risk and enhance access to airspace for all airspace users.

CP4. Airspace design should facilitate the delivery of surveillance services and enhanced communication channels where the capability exists

2.2 Non towered airport Class E trial

November 2019  CP1 CP2 CP3 CP4

SO1

CASA OAR ARASMM 3.3

- safety
- protection of the environment
- efficient use of airspace
- equitable access
- national security
- current and future needs of the Australian aviation industry
- advances in technology
- international best practice as may be adapted to benefit Australia’s aviation environment
- ICAO Standards and Recommended Practices.

Service Outcomes

SO1. Ensure the safety of air navigation is the most important consideration while fostering and promoting civil aviation

SO2. Provide a predictable, efficient and effective service to the aviation industry

SO3. Innovate for airspace user value aligned with global industry expectations
Part 1
Current State

Airspace Modernisation Program – Tranche 3

<table>
<thead>
<tr>
<th>Terminal Area Service</th>
<th>Terminal Area Upper Limit</th>
<th>Overlying Area Service</th>
<th>Terminal Area Service</th>
<th>Terminal Area Upper Limit</th>
<th>Overlying Area Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS</td>
<td>D</td>
<td>A085</td>
<td>C</td>
<td>G</td>
<td>NA</td>
</tr>
<tr>
<td>AY</td>
<td>D</td>
<td>A085</td>
<td>C</td>
<td>G</td>
<td>NA</td>
</tr>
<tr>
<td>BRM</td>
<td>D</td>
<td>A055</td>
<td>E</td>
<td>G</td>
<td>NA</td>
</tr>
<tr>
<td>CFS</td>
<td>D</td>
<td>A045</td>
<td>C</td>
<td>G</td>
<td>NA</td>
</tr>
<tr>
<td>HM</td>
<td>D</td>
<td>A045</td>
<td>C</td>
<td>G</td>
<td>NA</td>
</tr>
<tr>
<td>KA</td>
<td>D</td>
<td>A055</td>
<td>E</td>
<td>G</td>
<td>NA</td>
</tr>
<tr>
<td>LT</td>
<td>D</td>
<td>A085</td>
<td>C</td>
<td>D</td>
<td>A085</td>
</tr>
<tr>
<td>MK</td>
<td>D</td>
<td>A045</td>
<td>C</td>
<td>E</td>
<td>A045</td>
</tr>
<tr>
<td>RK</td>
<td>D</td>
<td>A045</td>
<td>C</td>
<td>E</td>
<td>A045</td>
</tr>
<tr>
<td>TW</td>
<td>D</td>
<td>A085</td>
<td>C</td>
<td>G</td>
<td>NA</td>
</tr>
</tbody>
</table>

Today’s regional airport airspace environment

- 5 different tower configurations
- Inefficient use of resources
- Surveillance coverage not leveraged
- Inconsistent risk to service level application
- Not conducive to a generic endorsement environment
- Difficult for pilots operating multiple flight sectors
Part 1
Current State

Airspace Modernisation Program – Tranche 3
### Tranche 3

**Proposed changes: May 2020 AIRAC**

<table>
<thead>
<tr>
<th>Section</th>
<th>Change Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Replacing class C airspace with class E airspace above regional airports. (Airports include AY, AS, CFS, HM, <strong>HB</strong>, LT, MK, RK &amp; TW)</td>
</tr>
<tr>
<td>3.2</td>
<td>Out of tower hours Class G</td>
</tr>
<tr>
<td>3.3</td>
<td>Lower Class E steps outside of tower hours</td>
</tr>
<tr>
<td>3.4</td>
<td>Lower the Class E steps down from A055 to A045 at BRM &amp; KA &amp; transfer jurisdiction to Enroute (replacing 1000 ft. of class D during tower hours and class G when tower is deactivated)</td>
</tr>
<tr>
<td>3.5</td>
<td>Lower Class E at AYE (replacing 1000 ft. of class G airspace)</td>
</tr>
</tbody>
</table>
Part 1
End state overview of Tranche 3 model
Part 1
Tranche 3 operating state

<table>
<thead>
<tr>
<th>Terminal Area Service</th>
<th>Terminal Area Upper Limit</th>
<th>Overlying Area Service</th>
<th>Terminal Area Service</th>
<th>Terminal Area Upper Limit</th>
<th>Overlying Area Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS</td>
<td>D</td>
<td>A045</td>
<td>E</td>
<td>G</td>
<td>A045</td>
</tr>
<tr>
<td>AY</td>
<td>D</td>
<td>A045</td>
<td>E</td>
<td>G</td>
<td>A045</td>
</tr>
<tr>
<td>BRM</td>
<td>D</td>
<td>A045</td>
<td>E</td>
<td>G</td>
<td>A045</td>
</tr>
<tr>
<td>CFS</td>
<td>D</td>
<td>A045</td>
<td>E</td>
<td>G</td>
<td>A045</td>
</tr>
<tr>
<td>HM</td>
<td>D</td>
<td>A045</td>
<td>E</td>
<td>G</td>
<td>A045</td>
</tr>
<tr>
<td>KA</td>
<td>D</td>
<td>A045</td>
<td>E</td>
<td>G</td>
<td>A045</td>
</tr>
<tr>
<td>LT</td>
<td>D</td>
<td>A045</td>
<td>E</td>
<td>G</td>
<td>A045</td>
</tr>
<tr>
<td>MK</td>
<td>D</td>
<td>A045</td>
<td>E</td>
<td>G</td>
<td>A045</td>
</tr>
<tr>
<td>RK</td>
<td>D</td>
<td>A045</td>
<td>E</td>
<td>G</td>
<td>A045</td>
</tr>
<tr>
<td>TW</td>
<td>D</td>
<td>A045</td>
<td>E</td>
<td>G</td>
<td>A045</td>
</tr>
<tr>
<td>AYE</td>
<td>not applicable</td>
<td></td>
<td></td>
<td>G</td>
<td>A045</td>
</tr>
</tbody>
</table>

Tomorrow’s regional airport airspace environment

- A single, generic service configuration
- ATC resources optimised and flexible
- Consistent risk model applied to service level
- Surveillance coverage maximised
Part 1
Tranche 3 operating state
WHY?

- There are no airspace triggers, only tower triggers.
- There is no rapid response to capability uplift as locations grow.
- We need to match the airspace to the level of service commensurate with the location using a consistent model, not simply leaving it ‘as is’ and ‘over servicing’ while a location grows into its classification.
- Because ultimately it costs you.
- As it uses valuable and scarce ATC resources.
- Where collectively we think they are better used elsewhere.
- e.g. // Runways, UTM, high density.

Because we can’t have everything?
### How big is big?

#### Towered Vs. Un-towered

<table>
<thead>
<tr>
<th>Port</th>
<th>Risk Group</th>
<th>VFR Source</th>
<th>Movements (M)</th>
<th>Air Transport Movements (ATM)</th>
<th>Passenger Counts (PAX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YSSY - SYDNEY</td>
<td>3</td>
<td>Towered</td>
<td>367,417</td>
<td>334,367</td>
<td>44,617,476</td>
</tr>
<tr>
<td>YMML - MELBOURNE</td>
<td>3</td>
<td>Towered</td>
<td>245,050</td>
<td>245,727</td>
<td>37,067,492</td>
</tr>
<tr>
<td>YBRR - BRISBANE</td>
<td>3</td>
<td>Towered</td>
<td>211,647</td>
<td>210,842</td>
<td>23,848,343</td>
</tr>
<tr>
<td>YPPH - PERTH</td>
<td>3</td>
<td>Towered</td>
<td>131,619</td>
<td>130,523</td>
<td>13,334,483</td>
</tr>
<tr>
<td>YPAL - ADELAIDE</td>
<td>3</td>
<td>Towered</td>
<td>106,406</td>
<td>103,162</td>
<td>8,592,744</td>
</tr>
<tr>
<td>YBCG - COOLANGATTA</td>
<td>3</td>
<td>Towered</td>
<td>96,451</td>
<td>50,555</td>
<td>6,541,850</td>
</tr>
<tr>
<td>YBCS - CAIRNS</td>
<td>3</td>
<td>Towered</td>
<td>108,275</td>
<td>61,742</td>
<td>5,273,033</td>
</tr>
<tr>
<td>YPDF - DARWIN</td>
<td>3</td>
<td>Towered</td>
<td>80,404</td>
<td>55,435</td>
<td>2,204,952</td>
</tr>
<tr>
<td>YPCN - CANBERRA</td>
<td>3</td>
<td>Towered</td>
<td>61,644</td>
<td>42,864</td>
<td>3,209,795</td>
</tr>
<tr>
<td>YHMC - HOBART</td>
<td>3</td>
<td>Towered</td>
<td>58,780</td>
<td>26,159</td>
<td>2,717,866</td>
</tr>
<tr>
<td>YGCG - MELBOURNE</td>
<td>3</td>
<td>Towered</td>
<td>61,107</td>
<td>35,242</td>
<td>1,838,776</td>
</tr>
<tr>
<td>YBTL - TOWNSVILLE</td>
<td>3</td>
<td>Towered</td>
<td>22,491</td>
<td>18,605</td>
<td>1,407,564</td>
</tr>
<tr>
<td>YBLT - LAUNCESTON</td>
<td>3</td>
<td>Towered</td>
<td>63,216</td>
<td>18,285</td>
<td>1,322,619</td>
</tr>
<tr>
<td>YWLM - WILLIAMTOWN</td>
<td>1</td>
<td>Towered</td>
<td>58,900</td>
<td>20,980</td>
<td>1,159,900</td>
</tr>
<tr>
<td>YBMM - MACKAY</td>
<td>3</td>
<td>Towered</td>
<td>28,301</td>
<td>29,177</td>
<td>882,679</td>
</tr>
<tr>
<td>YBAI - ALICE SPRINGS</td>
<td>3</td>
<td>Towered</td>
<td>24,291</td>
<td>19,341</td>
<td>684,928</td>
</tr>
<tr>
<td>YBRI - BROOME</td>
<td>3</td>
<td>Towered</td>
<td>24,618</td>
<td>24,824</td>
<td>629,206</td>
</tr>
<tr>
<td>YBH - ROCKHAMPTON</td>
<td>3</td>
<td>Towered</td>
<td>24,363</td>
<td>16,659</td>
<td>622,346</td>
</tr>
<tr>
<td>YPKA - KARRATHA</td>
<td>3</td>
<td>Towered</td>
<td>23,249</td>
<td>19,942</td>
<td>570,258</td>
</tr>
<tr>
<td>YBRK - BANKSTOWN</td>
<td>3</td>
<td>Towered</td>
<td>273,686</td>
<td>27,208</td>
<td>178,240</td>
</tr>
<tr>
<td>YPJ - JANADAT</td>
<td>3</td>
<td>Towered</td>
<td>208,565</td>
<td>18,405</td>
<td>111,567</td>
</tr>
<tr>
<td>YAMR - MOORABBIN</td>
<td>3</td>
<td>Towered</td>
<td>267,626</td>
<td>15,665</td>
<td>79,219</td>
</tr>
<tr>
<td>YAV - AVALON</td>
<td>3</td>
<td>Towered</td>
<td>12,478</td>
<td>7,494</td>
<td>882,582</td>
</tr>
<tr>
<td>YBH - HAMILTON IS</td>
<td>3</td>
<td>Towered</td>
<td>22,855</td>
<td>12,636</td>
<td>460,164</td>
</tr>
<tr>
<td>YCLS - COFFS HARBOUR</td>
<td>3</td>
<td>Towered</td>
<td>27,678</td>
<td>9,063</td>
<td>428,235</td>
</tr>
<tr>
<td>YPPB - TAMWORTH</td>
<td>3</td>
<td>Towered</td>
<td>182,829</td>
<td>10,733</td>
<td>234,544</td>
</tr>
<tr>
<td>YMDM - ESSENDON</td>
<td>3</td>
<td>Towered</td>
<td>56,070</td>
<td>39,191</td>
<td>202,765</td>
</tr>
<tr>
<td>YKB - ARCHERFIELD</td>
<td>3</td>
<td>Towered</td>
<td>189,436</td>
<td>8,207</td>
<td>44,352</td>
</tr>
<tr>
<td>YSCN - CAMDEN</td>
<td>2</td>
<td>Towered</td>
<td>106,482</td>
<td>2,056</td>
<td>7,671</td>
</tr>
<tr>
<td>YPPE - PARRAFIELD</td>
<td>3</td>
<td>Towered</td>
<td>238,163</td>
<td>2,304</td>
<td>6,659</td>
</tr>
<tr>
<td>YMAY - ALBURY</td>
<td>3</td>
<td>Towered</td>
<td>43,310</td>
<td>11,997</td>
<td>279,896</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port</th>
<th>Risk Group</th>
<th>VFR Source</th>
<th>Movements (M)</th>
<th>Air Transport Movements (ATM)</th>
<th>Passenger Counts (PAX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VYNA - BALLINA</td>
<td>2</td>
<td>Untowered</td>
<td>13,200</td>
<td>5,700</td>
<td>541,900</td>
</tr>
<tr>
<td>YBPN - PROSERPINE</td>
<td>2</td>
<td>Untowered</td>
<td>6,447</td>
<td>3,440</td>
<td>450,779</td>
</tr>
<tr>
<td>YPPH - PORT HEDLAND</td>
<td>2</td>
<td>Untowered</td>
<td>12,169</td>
<td>9,433</td>
<td>431,908</td>
</tr>
<tr>
<td>YAYE - AYERS ROCK</td>
<td>2</td>
<td>Untowered</td>
<td>23,400</td>
<td>5,900</td>
<td>420,900</td>
</tr>
<tr>
<td>YTHQ - HORN ISLAND</td>
<td>2</td>
<td>Untowered</td>
<td>26,402</td>
<td>18,888</td>
<td>156,206</td>
</tr>
<tr>
<td>YMNW - NEWMAN</td>
<td>3</td>
<td>Untowered</td>
<td>11,256</td>
<td>7,808</td>
<td>346,658</td>
</tr>
<tr>
<td>YMKG - KALGOORLIE</td>
<td>2</td>
<td>Untowered</td>
<td>50,400</td>
<td>9,100</td>
<td>319,100</td>
</tr>
<tr>
<td>YSDB - DUBBO</td>
<td>2</td>
<td>Untowered</td>
<td>24,278</td>
<td>14,056</td>
<td>239,185</td>
</tr>
<tr>
<td>YGLA - GLADESTONE</td>
<td>2</td>
<td>Untowered</td>
<td>16,594</td>
<td>10,172</td>
<td>274,642</td>
</tr>
<tr>
<td>YMIA - MILDURA</td>
<td>2</td>
<td>Untowered</td>
<td>19,300</td>
<td>9,700</td>
<td>256,000</td>
</tr>
<tr>
<td>YFBM - MOUNT ISA</td>
<td>2</td>
<td>Untowered</td>
<td>15,345</td>
<td>11,201</td>
<td>246,040</td>
</tr>
<tr>
<td>YPMQ - PORT MACQUARIE</td>
<td>2</td>
<td>Untowered</td>
<td>41,559</td>
<td>7,919</td>
<td>239,278</td>
</tr>
<tr>
<td>YSWG - WAGGA WAGGA</td>
<td>3</td>
<td>Untowered</td>
<td>37,300</td>
<td>10,820</td>
<td>236,166</td>
</tr>
<tr>
<td>YVEM - EMERALD</td>
<td>3</td>
<td>Untowered</td>
<td>10,664</td>
<td>7,256</td>
<td>227,045</td>
</tr>
<tr>
<td>YUSB - BUNDABERG</td>
<td>2</td>
<td>Untowered</td>
<td>21,357</td>
<td>10,119</td>
<td>198,472</td>
</tr>
</tbody>
</table>

#### Base Trigger Criteria

<table>
<thead>
<tr>
<th>Movements</th>
<th>80,000</th>
<th>Exceeds trigger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Transport Movements</td>
<td>16,000</td>
<td>Within 10% of trigger</td>
</tr>
<tr>
<td>Passenger</td>
<td>350,000</td>
<td>Does not exceed trigger</td>
</tr>
</tbody>
</table>
Indicative Schedule

- Safety modelling and risk assessment has commenced.
  - Your input will be part of this.
- Stakeholder engagement started Monday 15 April (5-6 weeks)
  - Feedback welcome via stakeholder@airservicesaustralia.com
- ACP submission in July 2019
- ACP approval prior to October 2019 cut-off for May 2020 AIRAC
- ATC training and pilot education April 2020
- May 2020 AIRAC implementation

Your training impact?
Background

EnergyAustralia proposes to construct the new Tallawarra B open cycle gas turbine (OCGT) adjacent to the existing Tallawarra A combined cycle gas turbine (CCGT) at Tallawarra Power Station. EnergyAustralia have conditional approval to proceed with Tallawarra B development at Tallawarra, 2.57 nm NE of the Illawarra Regional Airport Aerodrome Reference Point. The Department of Planning and Environment has conditionally approved either a single Closed Cycle Gas Turbine (CCGT) unit or two Open Cycle Gas Turbine units (OCGT). This conditional approval means that the proponent must be able to demonstrate that the plant will not have an adverse impact upon aviation safety.

EnergyAustralia is seeking to build OCGT units because they can be turned off and on more quickly to meet peak demand. EnergyAustralia has two preferred development scenarios:

- Scenario 1 – a single 300 MW F-class GT
- Scenario 2 – two 150 MW E-class GTs

This proposal has been under assessment at CASA for a number of years and during this process feedback has been received from various aviation stakeholders in relation to EnergyAustralia’s proposal. Whilst this feedback has been supportive of the construction of CCGT units it has not been supportive of the construction of OCGT units. However, now that an Airspace Change Proposal (ACP) has been received from the proponent, the OAR is obliged to consult about this ACP with the aviation community.

Part 139.370 of the Civil Aviation Safety Regulations 1988 (CASR) provides that CASA may determine that a gaseous efflux having a velocity in excess of 4.3 m/s is, or will be, a hazard to aircraft operations because of the velocity or location of the efflux.

However, the Manual of Aviation Meteorology (2003) defines the classifications of turbulence intensity as:

- **Light.** (1.5 - 6.1 m/s) which can cause momentary changes in altitude and attitude.
− **Moderate.** (> 6.1 - 10.6 m/s) which can cause appreciable changes in altitude and attitude.
− **Severe.** (>10.6 m/s - 15.2 m/s) which can cause large abrupt changes in altitude and attitude and a momentary loss of control
− **Extreme.** (> 15.2 m/s) where it can be practically impossible to control the aircraft, and which can cause structural damage.

An exhaust plume of moderate or higher turbulence intensity has the potential to affect the safety of aircraft operations, such as aircraft in critical stages of flight (periods of high pilot workload) and low-level flying operations. Therefore, it is this figure of 6.1 m/s which has been used to assess this plume.

For further background information about how plume rises are assessed refer to CASA’s [Advisory Circular 139-05 Plume Rise Assessments](http://www.casa.gov.au).

**Previous assessment of plume rise**

The OAR accepted a plume rise assessment provided by Jacobs (2017) which resulted in the figures noted below:

If scenario 1 is elected: Height of the 6.1m/s plume: 1270FT (AHD) Lateral extent: 254m radius
If scenario 2 is elected: Height of the 6.1m/s plume: 1295FT (AHD) Lateral extent: 260m radius (0.14NM)

The potential for the plume rise to merge with those from the existing Tallawarra A power plant was considered negligible.

Airservices assessed the above figures and determined that the plume rise will affect one procedure into Wollongong (the RNAV-Z (GNSS) RWY 16), regardless of which scenario is used. This will mean that currently published minima for this procedure will need to be raised if an OCGT facility is constructed.

The plume rise may also affect operations within the circuit area at Wollongong. Circuit operations at Wollongong aerodrome using RWY 16/34 are flown to the east of the aerodrome for noise abatement. Aircraft would fly over the Tallawarra facility during the crosswind leg or downwind turn (RWY 34), or during the downwind leg or base turn (RWY 16) at about 1000FT altitude. Aircraft at these positions could be exposed to the plume with moderate turbulence, although for only a few seconds.

**Proposal**

To make airspace users aware of the residual airspace risk posed by the plume rise from the proposed facility a DA is proposed with the following dimensions:

**Vertical limits:** Surface to 1300FT AMSL

**Lateral limits:** A circle of 0.20NM radius centred on S34 31 18.18 E150 48 32.70

This proposed DA is noted as the red circle next to Lake Illawarra on the chart below:
NSW RAPAC members are invited to provide feedback to oar@casa.gov.au by 27 June 2019.
Airspace Change Proposal (ACP) for Tallawarra B OCGT
NSW will be short of power on peak days after Liddell closes in 2022

EA has proposed a 300-350MW power station at Tallawarra to mitigate this risk

With the intermittency of renewables with variable output, the market needs flexible fast-start plant:
  - OCGT starts in 10-15 minutes
  - CCGT can take up to 6 hours

The project is therefore designed as an open cycle gas turbine (OCGT)

Many airports around Australia have high velocity plumes in close proximity; this technology can co-exist safely with airport operations
Shellharbour City Council and the Airport Operators have agreed fly neighbourly practices which state that:

- Pilots use runway 08 (to the east) only when operationally necessary (due to wind direction).
- Helicopters are not allowed to overfly the residential area to the east of the airport at an altitude less than 1000ft (300m).
- Pilots to avoid flight over Haywards Bay when taking off and landing on runway 16/34
- Air Ambulance helicopter pilot familiarisation training is restricted to practice approach and departures.
- Night training restricted to north/south runway with runway 34 preferred.
- Night circuit training to cease at 10pm local time.

Further information for pilots is available on the AirServices Australia website: [http://www.airservicesaustralia.com/aip/aip.asp](http://www.airservicesaustralia.com/aip/aip.asp)
Site Context

- Tallawarra Power Station
- Haywards Bay Residential Area
- Wollongong Aerodrome (YWOL)
Sydney Visual Navigation Chart (VNC)

Tallawarra Power Station
Tallawarra Power Station is approximately 2 nm from the threshold of runway 16 and 2.5 nm from the threshold of runway 26.

The danger area initially proposed by CASA, with a radius of 0.2 nm and centred on the power station site, would extend to within a distance of approximately 2.3 nm from the aerodrome reference point.

For the purposes of the analysis, the following design parameters have been adopted:

- 1 nm upwind to achieve at least 500 ft AGL;
- 1 nm abeam the runway for downwind spacing;
- 45° relative position from the threshold for the turn from downwind onto the base leg; and
- Roll out at 1 nm final, not below 500 ft AGL.

For aircraft conducting a straight-in approach, the final leg must be joined not closer than 3 nm from the threshold, and therefore is not considered a factor in potential impacts arising from the proposed power station.
Circuits on runways 16 and 34 are conducted to the east of the aerodrome
Circuits on runways 08 and 26 are conducted to the north of the aerodrome.
aircraft flying at or above 500 ft AGL/AMSL but below 1296 ft AMSL may encounter moderate turbulence, which is acceptable for VFR aircraft

IFR aircraft will be separated from the hazard through instrument procedure design
➢ Aircraft operating at Wollongong Airport will be able to safely conduct standard circuit operations in accordance with applicable regulations and guidance if a small danger area is established over the Tallawarra B power station.

➢ To facilitate the implementation of the danger area, EnergyAustralia has prepared and submitted an Airspace Change Proposal for consideration by CASA that includes a safety case and records of consultation with local airport users and the operator of Wollongong Aerodrome.
Our Concerns

1) Conditions of the approval are not met.

2) The plume rise assessment does not adequately address how different aircraft type parameters are affected by the plume.

3) The proposed Danger Area is inadequate based on the actual risk.
1) Conditions of the approval are not met:

1.6 Nothing in this approval permits the construction and operation of an open cycle gas turbine plant, unless the Proponent has submitted a report to the Secretary which demonstrates that operation of an open cycle gas turbine plant will not have an adverse impact on aviation safety. This report must be prepared in consultation with Shellharbour City Council, and its conclusions and recommendations must have been agreed to by the Civil Aviation Safety Authority prior to submission to the Secretary. The report must be approved by the Secretary before commencement of construction of an open cycle plant.
2) The plume rise assessment does not adequately address how different aircraft type parameters are affected by the plume.

- TAPM does not consider the force required to cause aircraft upset. For example RA Aus consider 0.5G to be the lower limit of severe turbulence which contradicts the extract below that is similar to the BoM extract which relates to larger aircraft not the light aircraft traffic heavily experienced at YWOL.

<table>
<thead>
<tr>
<th>Derived Gust (feet per second)</th>
<th>Derived Gust (converted to meters per second)</th>
<th>Peak Vertical Acceleration (g’s)</th>
<th>Turbulence Intensity</th>
<th>Description of Turbulence</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - 20</td>
<td>1.52 – 6.10</td>
<td>0.2 – 0.5</td>
<td>Light</td>
<td>Momentarily causes slight, erratic changes in altitude and/or attitude (pitch, roll, and yaw).</td>
</tr>
</tbody>
</table>
The below is a graphical representation on two different aircraft types exposed to the exact same plume at the exact same crossing height (approx. 1200ft). This highlights the **importance of considering aircraft type** in assessing the adverse impact of plume rise on aviation safety.
3) The proposed Danger Area is inadequate based on the actual risk.

a) The plume is within the circuit area.
b) The Danger Area is an administrative control that heavily exposes itself to human error.
c) There isn’t one like it in the country when the YWOL operating environment is considered.
- Tallawarra B located approx. 2.50 nautical miles from YWOL ARP.

- Circuits are operated to the north and east of these runways due to terrain to the south and west. It is also bordered by controlled airspace.

- The plume penetrates the Inner Horizontal which is used to protect aircraft flying visually in the circuit.

- The extent of the penetration of the PANS OPS is unconfirmed.
a) The plume is within the circuit area.

The attached image reflects the flight tracks for one aircraft operator that flies C172 and C208 type aircraft. There are other operators who also fly a similar path and regularly join downwind for 16 overflying Tallawarra an example.
a) The plume is within the circuit area.

PILOTS MAY VARY THE SIZE OF THE CIRCUIT DEPENDENT ON A NUMBER OF FACTORS.
b) The Danger Area is an administrative control that heavily exposes itself to human error.

Why not build it somewhere else?

Build an appropriate Closed Cycle Gas Turbine?

Examples include installing baffles and/or covers, adjusting the exhaust outlet size, appropriateness of the location of a proposed facility by siting the facility away from critical aircraft operation areas, efflux orientation and masking of the plume efflux.

Danger Area – pretty low on the list of controls! (ISO31000).
New AC139-05(3) Differences?

- Where’s Human Factors Considerations?
- What about proximity to YWOL?
b) The Danger Area is an administrative control that heavily exposes itself to human error.

- Human error can be attributed as a causal factor in 70-80% of aviation accidents.

- A local aircraft operator has confirmed that over the previous 3 months they have encountered 1-2 incidents per month where uncontactable aircraft have flown through the ‘Danger Area’ during parachute operations.

- A report by the ATSB (2008) entitled ‘Safety in the vicinity of non-towered aerodromes’ revealed that procedural and communication errors were the most prevalent followed by situational awareness and position/proximity issues in their safety occurrence causation investigations.
b) The Danger Area is an administrative control that heavily exposes itself to human error.

Consider the following scenarios:

The circuit is crowded, you find a slot to join, you become focussed on maintaining a reasonable space between you and the aircraft in front and communicating to ensure the pilot behind has you in sight. The circuit opens up automatically to maintain spacing, you experience “speed blindness”, the danger area is forgotten and upon extending the 16 downwind leg, you fly through the plume. (Speed blindness is a well-documented phenomenon where a driver or pilot focuses on something up front and literally loses his/her peripheral vision and awareness of anything other than what focussed on. The phenomenon is more applicable if you are moving and it is more prevelent the faster you are travelling).

You return home after a long trip. Clouds are sitting on the escarpment and you have come home coastal. From the south, a join across the lake gives you the cleanest approach, over water, devoid of obstacles. The atmosphere closes down towards the mountains as it often does under these circumstances. With minimal wind, a runway16 base leg join from the east is the safest approach. A hot plume under these conditions could well show a relatively clear area over the stacks, and it would be very enticing to track towards that area for the base leg join. A similar situation applies arriving coastal from the north. The inbound turn would be just south of Port Kembla for a base leg join runway 16.
Suitability of a Danger Area within the YWOL Circuit

1) Administrative controls rely heavily on people to ‘read, interpret, remember and implement’ them.

2) It’s not a requirement to carry maps in all instances of flying activities therefore increasing risk of human error in a complex operating environment.

3) 70-80% of aviation accidents are attributable to human error.

4) Across Australia there are only 3 Danger Areas relevant to High Velocity Exhaust Plumes within 3nm of an aerodrome. These aerodromes vary greatly to the operation of YWOL (Oakey, Moomba and Ballera).

5) YWOL experiences issues with existing Danger Areas for parachute operations.
c) There isn’t a ‘Danger Area’ like it in the country when the YWOL operating environment is considered.

YWOL is a complex environment with incredibly high levels of light aircraft traffic operating within a narrow area of uncontrolled airspace that is surround by high terrain to the east and bordered by control zones. Aircraft activity continues to grow and the area will only become more congested as time goes on.

The proposed strategy is an unprecedented tactic to ensure aviation safety. If we consider existing ‘Danger Areas’ for high velocity plumes within 3nm to an Australian aerodrome you will note there are distinct differences between the operating environments when compared to YWOL. Across Australia, there are only three ‘Danger Areas’ relevant to High Velocity Exhaust Plumes within 3nm of an aerodrome; Oakey, Moomba and Ballera. Of these three aerodromes, Oakey is controlled, Moomba experiences extremely light levels of light aircraft traffic and primarily serves commercial gas extraction and related industries and Ballera operates a unicom service with extremely low levels of light aircraft traffic and operated by a large mining corporation.
Conclusion and Recommendations

1. We conclude that an unacceptable adverse impact to aviation safety would still exist if a ‘Danger Area’ is implemented.

2. We recommend that CASA does not accept this ‘Airspace Change Proposal.’