Memorandum

To: Ms. Kate Harris, Ashe Morgan Winthrop

cc:

From: Brian Jackson

Date: 21/11/2007

Re: **Illawarra Regional Airport**

Dear Kate:

I refer to your recent request to Ambidji for a response to proposals put forward by Shellharbour City Council to upgrade the Illawarra Regional Airport (IRA) to possible accommodate larger aircraft.

As SCC has alluded, the low cost carriers (LCC) are tending to look at the cheaper regional airports for their operations, particularly if such airports are closely located to the major metropolitan centres and have the potential to capture market not only from the immediate regional vicinity but also from the outlying metropolitan suburbs. Avalon Airport in Melbourne is a good example of this current level of thinking and, based on this philosophy and what has recently occurred with respect to Tiger Airlines nominating Newcastle as a destination, it is understandable as to why SCC now views IRA as a potential candidate airport for an LCC operation.

However, unlike the other regional airports, Ambidji considers that IRA may not present as attractively to a prospective LCC entrant as IRA presents a number of operational constraints, which may not make it attractive for SCC to upgrade the airport. These potential constraints are discussed in more detail below.

Disclaimer

It should be noted that this report has been prepared by Ambidji without the benefit of an on-site inspection or access to detailed planning data. It is more a general commentary on various aspects that may require attention prior to any introduction of larger jet aircraft at Illawarra Regional Airport. It is not exhaustive and does not seek to provide a definition of new aerodrome facilities.

EXISTING AIRPORT

Runways

IRA has the two runways:

- Runway 08/26 is 1331 metres long and 30 metres wide; and
- Runway 16/34 (the main runway) is 1819 metres long and 30 metres wide.

The use of RWY 16/34 from the South is constrained by the surrounding topography, which is likely to limit the types of aircraft that can operate on this runway (RWY). Despite its published

runway length of 1,819 metres, the RWY 34 threshold is displaced by 176 metres, giving it a reduced Landing Distance Available (LDA) of only 1,643 metres. However, the full length of 1,819 metres is available for aircraft taking off from this runway.

RWY 16/34 is 30 metres wide and set within a 90 metre wide Runway Strip. Its strength is defined by its Pavement Classification Number (PCN) 23.

Existing Radio Navigation and Landing Aids

Existing navigation and lighting aids are:

- Pilot Activated Aerodrome Lighting (PAALC)
- Precision Approach Path Indicator (PAPI) RWY 16/34 only
- Non Directional Beacon (NDB)
- Automatic Weather Station

The above aids are noted in the En Route Supplement Australia (ERSA) and are appropriate for a Non-Precision Approach Runway. The NDB approach is not runway specific and, therefore, requires visual circling to facilitate the aircraft on to final approach for any runway.

IRA also has a satellite-derived RNAV (GNSS) instrument approach published for RWY 16/34. This approach is considered to be a non-precision approach that allows certain aircraft to descend to a much lower minima (as low as 888 feet above ground level) than the NDB approach described above, provided they are conducting a "straight in" approach to RWY16.

It would appear that the published descent minimas for the instrument approaches allow for the fact that the airport currently does not meet the required 150 metre flight strip requirements for a non-precision instrument runway.

IRA currently operates on a CTAF(R), which means the airport is uncontrolled and requires aircraft with mandatory radio equipment to arrange their own separation through the pilots talking to each other.

Existing Airport - Users

Existing users include:

- Aeronautical industry cluster including various private and charter General Aviation aircraft;
- CHC Helicopters who operate Bell 412 helicopter services on behalf of Ambulance Service NSW (unofficial reports suggest that this might be relocated to the south east quadrant of the airport);
- Historical Aircraft Restoration Society (HARS);
- QANTAS scheduled services – Dash 8 operating eight turnarounds per working week to Melbourne; and
- Very infrequent visits by QANTAS B737 charter aircraft.

Notwithstanding the special requirements of the HARS' fleet and other charters, the most demanding regular aircraft operating into IRA is the QANTAS Dash 8 aircraft, which flies seven scheduled turnarounds per working week into IRA.

Current operations at IRA are restricted to Code 2C aircraft which require a runway of between 800 metres to 1200 metres long and a wingspan of between 24 metres and 36 metres. The existing 90 metre wide runway strip is compatible with the Code 2C.

PROPOSED IRA UPGRADE

Aerodrome Reference Code

Although SCC has not specifically stated what ARC they intend to upgrade IRA to, the jet aircraft that they consider most likely to use the airport in the future implies that the minimum ARC would need to be a minimum 3C[1]. IRA currently holds a 2C classification.

The upgrade of ARC to Code 3C now dictates an increased runway length of between 1,200 and 1,800 metres, up from the 800 to 1,200 metres required for a Code 2C airport.

The introduction of Code 3C aircraft changes operating conditions at IRA. SCC indicates that it is planning a Runway Strip 150 metres wide and that this can be accommodated within the existing airport boundary although there will be some impact on surrounding properties.

Impact on Runway Pavement Width

The Manual of Standards (MOS) notes that for a Code 3C runway the existing 30 metres pavement width is appropriate.

Impact on Runway Length

A runway length of approximately 1,800 metres is appropriate for E170/190 operations and for B737/A320 operations with restricted payloads. The RWY 34 LDA of 1,643 metres is considered to be about the minimum that would be acceptable for these types of jets (the need for a displaced Threshold being caused by mountains to the south of IRA penetrating the approach surfaces.)

Scheduled Code 3C aircraft operations must have new approaches and departures designed. The following safeguarded surface diagrams should be prepared:

- Obstacle Limitation Surfaces (OLS)
- Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS)

These diagrams may indicate that larger aircraft operations are not appropriate.

Operations by previous ad hoc charters, under special one-off circumstances, do not set any precedent.

Impact on Runway End Safety Area (RESA)

CASA is likely to consider that the re-development of RWY 16/34 equates to a new runway and require that a RESA be provided at each runway end. A minimum RESA extension of 90 metres will be required, potentially conflicting with the existing airport boundary.

[1] Normally A320/B737/E170 aircraft require airports certified to Code 4C. However, as most major regional airports in Australia normally only meet 3C standards, Ambidji understands that CASA permits such aircraft to operate into 3C airports subject to certain conditions.

If land cannot be acquired outside of the airport boundary (will require the redirection of roads) to accommodate the RESA requirements, then the available runway length at IRA would have to be reduced, thus constraining the operational and commercial viability of the airport.

Impact on Runway Strip Width

Under the CASA Manual of Operating Standards (MOS Part 139) two types of Runway Strip widths are required:

- 150 metres for a Non Precision Approach Runway; and
- 300 metres for a Precision Approach Runway.

It is extremely unlikely that CASA will permit airlines to operate scheduled E170/190 and B737/A320 aircraft into IRA without instrument approach assistance directly to the runway (i.e. via a 'straight in" approach). Currently, the only straight in instrument approach is on RWY 16 however, this non-precision approach (NPA) has some constraints applicable to jet aircraft due to surrounding topography considerations.

Ambidji considers that it would be most unlikely that precision approach capability could be installed at IRA due to the surrounding terrain, thus a 150 metre wide Runway Strip should only be required. Such strips are in existence at Ballina, Hervey Bay, Mt Isa, Broome and Karratha, all of which have RPT jet operations with B737 or A320 aircraft. The increased flight strip width will impact on the associated safeguarded (OLS) surfaces that will extend beyond the Runway Strip edge, impacting considerably on surrounding property and existing buildings. Within the airport boundary, it is considered highly likely that the taxiways, terminal and hangar areas would have to be redeveloped to ensure they stay below the OLS.

Impact on Aircraft (Jet) Operations

At present, the policy of the Qantas Group and Virgin Blue is that Regular Public Transport jet aircraft must make a straight-in approach on completion of an instrument approach rather than make a circling approach.

Therefore whilst a straight-in instrument approach is provided for Runway 16 (with significant operational limitations for jets), no such approach has been designed for Runway 34 due to terrain considerations. Whilst CASA does not prohibit a circling approach following the completion of an instrument approach, it certainly discourages such a practice for jet aircraft operations. This policy does not apply to turbo-prop aircraft such as the DHC-8.

Therefore, when weather conditions dictate the need to execute an instrument approach and the wind direction necessitates the use of Runway 34, an approach might not be able to be carried out and the aircraft would need to hold until conditions improved or divert to an alternate aerodrome.

Impact on Navigation/Approach Systems

Any increase to the runway length or pavement width will require re-alignment of the visual approach lighting systems while new, or relocated, navigation aids may also require changes to current published instrument non-precision approach procedures. There may also be a requirement for additional obstacle lighting to mark significant obstacle points on the approach and departure paths.

SCC may have to consider purchasing off-airport land to accommodate new navigation aids. Furthermore, nearby road traffic may have to be controlled as jet aircraft land and take-off in order to ensure adequate obstacle clearance for the aircraft.

Impact on Runway Pavement Strength

The ability of a runway to carry regular aircraft operations is judged by comparing the airport's published Pavement Classification Number (PCN) with the Aircraft Classification Number (ACN) established for each aircraft type.

IRA's PCN is currently 23, which compares with;

- B737-700: ACN of 44
- B737-800: ACN of 51
- A320: ACN of 41 – 44

Both the International Civil Aviation Organization and the UK authorities recommend that the ACN/PCN ratio should not exceed 1.1 to 1.25 of the airport's listed PCN. Australia does not have any recommended standard, leaving it to the airport operator's judgement. One-off flights may be allowed with immediate runway damage inspection. Airlines are unlikely to risk scheduled operations without major runway reconstruction.

IRA would require a significant upgrade in Runway Pavement Strength to accommodate regular, scheduled jet operations and Ambidji estimates the cost of such an upgrade to the runway pavement alone would be in the order of some $10 to 15 million dollars[2].

Impact on Runway Lighting

Reconstruction of the runway will require the re-provision of runway lighting. Depending on the eventual length of the new runway, lighting may need to be positioned outside the existing airport boundary.

Impact of Aircraft Noise

It would appear that the airport is surrounded by a significant level of residential development.

Previous noise studies are reported to have included the impact of jet aircraft up to 100 seats in size. B737/A320 aircraft are larger and potentially noisier, although the Embraer aircraft are considered as relatively quiet jets.

Notwithstanding, aircraft noise impacts will have to be reviewed. Unless there are significant numbers of pre-existing jet aircraft operating into IRA, the review is likely to have to be in the form of a complete Environmental Impact Statement (EIS) taking account all aspects of the introduction of scheduled jet services.

Increased noise levels emanating from regular jet aircraft operations will impact significantly on existing residential areas and will also impact on land use planning options around the airport, incurring significant community backlash.

[2] This figure is based on an estimated upgrade cost of $175 to $250 per square metre. Assuming a proposed runway length and width of 2,000 and 30 metres respectively (i.e. 60,000 square metres), the estimated cost of a pavement strength upgrade would be somewhere in the order of $10-15 million.

Impact on Airspace and Radio Procedures

Currently there is no local air traffic control exercised over operations at IRA. When required, this service is generally provided by Airservices Australia on a "user pays" basis, applied to all aircraft.

CASA specifies a passengers/annum criterion that determines the need for ATC or additional Aerodrome Radio Information services. Currently IRA does not approach these criteria.

Airports already served by RPT jet aircraft such as Ballina, Hervey Bay, Mt Isa and Karratha amongst others, currently have no regulatory requirement for these services as they, also, have not exceeded the criteria for increased services. However, it is known that CASA is seriously reviewing its regulatory position on this issue and may require the provision of such services based on a formal airspace risk analysis.

Impact on Rescue and Fire Fighting Facilities

RFFS capability is currently provided by metropolitan fire brigades.

CASA standards require the provision of a DEDICATED ON-SITE Aviation Rescue and Fire Fighting Service (ARFFS) at all airports handling more than 350,000 passengers per annum; however it should be noted that none of the airports mentioned in the paragraph above, as well as many others, require an ARFFS at this time.

Taking account of the existing Dash 8 service, this volume of passengers would be achieved by three B737/A320 turnarounds per day. Based on Code 3C aircraft, a minimum of two fire-fighting vehicle tenders are required. ARFFS provision is generally on a "user pays" basis, applied to all aircraft.

Impact on Security

Under the Air Transport Security Regulations (ATSR) airports are required to introduce a wide variety of security provisions at airports where scheduled jet aircraft services operate. These include:

- All-round fencing
- Passenger screening (X-ray and Explosive Trace Detection)
- Checked bag screening (X-ray)
- Transport Security Program
- Security staffing to carry out all aspects.
- Security provision is generally on a "user-pays" basis.

Any increase in the instrument approach capability of the runway may also require increased security arrangements.

Consideration – Jet Blast

MOS Part 139 notes that road traffic must be protected from jet blast where it exceeds 50 kph.

Both the Tongarra Road and Illawarra/Princes Highway are close to the RWY 16/34 ends. If there is an issue, they must either be moved or the traffic controlled and held back during jet operations. A suitable jet blast barrier could also be constructed.

SUMMARY

Based on this very cursory analysis, Ambidji considers that it would be most unlikely that IRA could be upgraded satisfactorily to Code 3C status as the existing topographical, community and infrastructure constraints would require significant capital investment to overcome.

Particularly, the length and strength of the main runway would need to be increased to meet minimum standards, as well as an allowance made for a Runway End Safety Area at each end of the main runway. The flight strip would also need to be increased to 150 metres either side of the existing main runway centreline to support runway-aligned non-precision instrument approaches down to the lowest possible minima. The increases in runway length and flight strip width would require a detailed re-evaluation of the surrounding topography and publication of new OLS and PANS-OPS charts before any assessment could be made as to whether jet aircraft could safely operate into/out of IRA. Jet aircraft operations would also require new runway-aligned instrument approach procedures that may not be possible given surrounding terrain constraints on both the approach and missed approach paths. On preliminary analysis, it would appear that the increased flight strip width of 150 metres may also require redevelopment of the existing taxiways, terminal and hangar areas in order to ensure the integrity of the OLS is maintained.

All of the above works would require significant capital investment and community consultation by SCC and, considering the number of jet aircraft operations likely to be attracted to servicing IRA, particularly in the short to medium term timeframe, Ambidji considers the business case supporting this level of capital investment by SCC may be hard to justify. Furthermore, considering the level of community consultation required and the complexity of the airport environment, it could be expected that the proposed master planning process would take a minimum of 3 years, while the implementation and redevelopment of the airport precinct could well take several more years on top of that.

Any proposed upgrade to IRA beyond the current Code 2C may facilitate increased services by the higher end turbo-prop aircraft such as the Q400, Saab 340 and Jetstream 41. However, given the current and acute shortage of pilots, many airlines are re-evaluating their air services to regional destinations and cancelling services to the less profitable ports in order to make pilot available for the more trafficked routes. Until the pilot shortage crisis is resolved, Ambidji considers that it would be most unlikely that regional airlines would be attracted to open up new air services unless the operating economics were overly compelling.

THE AMBIDJI GROUP PTY LTD

Ambidji is a fully independent, international consulting firm specialising in the planning, development and management of air transport infrastructure.

Ambidji offers an extensive range of professional consulting services covering air transport sector analysis, planning, policy development, institutional reform and business planning to facilitate the development of safe, economic and effective infrastructure. To support its management consulting activities, Ambidji is able to offer clients a strong technical capability in airport and airspace planning, air traffic management, aviation safety management and the engineering of technology based aviation systems and equipment.

Ambidji has played a key role in assisting a number of national and regional governments with the development and reform of their air transport sectors to ensure the air transport mode plays its proper role in a modern economy. Having worked in over 45 countries, the firm has a strong international experience record in assisting governments in reviewing, developing or implementing policies and plans relating to the establishment and modernisation of airports, airspace, regulatory frameworks, as well as air traffic control facilities and systems.

Ambidji's consultants are highly experienced within the civil aviation sector. Many of the firm's principals have previously held senior management positions with national airport and civil aviation authorities located in Australia, Europe and Asia and, in some cases, have provided technical expertise and assistance directly to ICAO air navigation and airport working panels.

Ambidji's consulting achievements in the air transport sector have been recognised by the US-based Air Traffic Control Association (ATCA). In 1998, the firm received the Chairman's Citation of Merit Award *"for outstanding achievement and contributions which have advanced the science of Air Traffic Control and enhanced the profession of the ATC system"*. Whilst this award relates specifically to air traffic control, we wish to highlight it as an indicator of the firm's professional approach to all our air transport consulting activities.