

Approach 19

PBN and airports: What we've learnt so far

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NZ Airports

A little background on the NZ Airports Association -

NZ Airports is the industry association representing all commercial airport operators in NZ and many of the smaller airports. The Association has 34 airport members and a number of members who are industries that support airports. As a consequence its members range from the largest such as Auckland Airport (with 89,000 IFR movements in the 6 months to Dec 2018) to the smaller regional airports such as Wanaka (with just 50 IFR flights in the same period).

Airports are closely aligned to the communities they serve and the economies of those communities. The community is often dependent on the airport for air access – business, tourism, health flights, access in emergencies, and recreation. In general the airport has a relationship with the economy of the community, and the community has needs that rely on air access.

Despite this relationship it is not always easy for airports to represent the views and interests of those communities.

It is a challenge for airports to represent community needs because many of the smaller airports in particular are managed by multi-skilled people with multiple roles. The ability to keep abreast of the subtleties of some of the changes proposed in system-wide developments such as those coming within the scope of New Southern Sky can be challenging.

Without the scale that enables specialisation, many small airport operators are not necessarily aware of the issues that could potentially have dramatic impact on air access for their communities. Many of those subtleties can be specific to the aerodrome or specific to a particular type of operation or operator that serves that aerodrome.

Identification of issues, the possible impact on what is regarded as the current level of service for access to their airport, and communication of those issues, let alone advocacy to get those issues resolved can be a real challenge.

In reviewing the learnings of airports from the performance based navigation journey so far I wish to say at the outset that the new Southern Sky framework has provided one of the most effective forums for collaboration across the aviation industry that I have seen in my career. So despite some shortcomings that have come to our attention in the PBN journey I want to assure you that NZ Airports supports the efforts that are being made to bring NZ in to this modern era of air navigation and technology.

PBN Implementation Plan

I want to start by reflecting on this chart which shows the large number of parties who need to collaborate to make the introduction of PBN effective. Airports are one of those groups on the diagram.

Success of PBN does require collaboration across a large number of “players”, and as I say, NSS has played a pivotal role in progressing that.

I have represented NZ Airports on the new Southern “Sky working group.

The PBN implementation plan which was last updated in 2017 sets out the pathway to the PBN environment that we aspire to by 2023. We still debate what that might actually look like, but Airports fully endorse the benefits that are identified in section 3 of the plan – particularly for the commercially viable airports. However at the present time there are challenges still to be resolved for the smaller regional airports that have to operate in an environment that is not commercially viable, and may be remote from the ground based navigation aids that are currently proposed to support GNSS navigation.

In addition, Airports are also following with interest, the possible development of SBAS, as this could dramatically change access to many airports – potentially providing ILS-like accuracy for vertical guidance into any airport that has the appropriate infrastructure and obstacle clearance.

Challenges for remote smaller communities and operators with range limitations

Uncontrolled airports, including regional airports with commercial services that do not have ATC (such as Whanganui, Hokitika and Timaru), are challenged for funding the establishment and maintenance of instrument flight procedures. Whereas Airways provide these procedures at controlled airports and fund those procedures through their charges to users, that is not the case for uncontrolled airports. The airport, the community, or an aircraft operator needs to engage with an instrument flight procedure designer to establish instrument flight procedures at those airports. And then they need to work out how its going to be paid for. There is something odd about the small end of the network being treated differently based solely on commercial decisions of one player in the business!

The PBN implementation project has also highlighted that the rules being developed for GNSS navigation may require a technical alternate for those procedures. At remote airports, particularly for aircraft operators with limited range capability, it may yet be that services which are currently delivered today cannot be delivered under a GNSS rule environment.

This is in part an outcome of the ground based navigation aids proposed to support GNSS, and the detail of the rules being developed for the safety of GNSS navigation. It would be rather ironic if advances in technology limit what can otherwise be undertaken today with older technology. However we hope that over coming months these issues will be resolved and the communities that enjoy air access in instrument met conditions can continue to receive at least the same services that they do today.

I referred to communication with remote communities earlier. It is difficult to explain to those communities the constraints which may be imposed under a new navigation regime when airports themselves, and often the aircraft operators at those airports, do not fully understand the environment proposed or the implications. It behoves all parties to articulate as clearly as possible what the new environment may look like so that any consultation is effective.

PBN at the larger airports

From a legal perspective, airports are required to have agreed in writing to a proposed instrument flight procedure at an aerodrome before any design work on a procedure is undertaken. A key reason for this, in addition to the need to ensure an obstacle-free environment for the procedure and for any limitations at the airport to be taken into account in the design, is the need for the airport operator to engage with the community as part of its responsibilities under the Resource Management Act in respect of the effects of noise.

All airports with Air Traffic Control have a service agreement with Airways that includes the provision of Instrument Flight Procedures, and the basis upon which those procedures will be created and maintained.

At the larger controlled airports, the early stages of PBN rollout was not without its challenges. For a period there was some frustration that airports were not clearing the way for new procedures to be put in place. Even at the larger airports such as Wellington and Christchurch a degree of frustration crept in. A frustration that delays might delay being able to “bank” the benefits of the new PBN procedures at those larger airports. However, getting it right is much more important in the long-run than getting quick access to the benefits of PBN.

The introduction of new flight paths is recognised world-wide as a challenge that must be managed carefully in conjunction with the communities affected. I am pleased to say that over time this has been recognised and there has been a collaborative approach that has enabled airports to work constructively with their affected communities.

More than 420 flights land and take off every day at Auckland Airport. As a result almost all of Auckland experiences some overflight by arriving or departing aircraft.

Some of the earliest procedures which altered the traditional routes of aircraft into Auckland airport gave rise to community concerns without Auckland airport having adequate opportunity to effectively manage that community impact.

Auckland Airport embarked on their new Smart Tracks trials in 2015-16 to measure and quantify the noise implications of new PBN routes, while engaging with the community to transparently demonstrate the benefits of these routes and the efforts being taken to minimise noise impacts on the affected communities. This has resulted in trial reports being published last year and the extensive use of an interactive real-time noise mapping tool that empowers affected communities to observe what is happening and if necessary engage with the airport.

Similarly in 2017 Christchurch Airport commenced trials of new procedures that affected a ¼ of the flights into Christchurch. This was undertaken again in close consultation with the communities affected - involving extensive measurement and monitoring. An interim report was report was provided on the trial in mid-2018 and the trial concluded at the end of last year.

Airports have been working with the CAA to quantify the benefits of PBN flight paths as those procedures affect noise impacts on communities.

You heard earlier from Wellington Airport on the detail of their efforts with PBN So each of these larger airports has been involved in very detailed studies and trials as they engage with the community. The delay while these airports managed the interactions with their communities was critical for RMA processes and is consistent with the way in which PBN has been implemented in overseas experiences.

PBN Engagement challenges

Last year the NSS working group established a panel to advise on the engagement necessary with key stakeholders to achieve “full” PBN implementation by 2023. That panel delivered a report in December 2018. Although many of the smaller airports have arrangements in place for instrument flight procedures under GNSS the report highlights the challenges that exist for those communities

One particular concern for the panel was that current procedures are a mix of RNAV and RNP depending on what the predominant commercial operators at the airport required for PBN navigation. At the time of writing that report, and based on the understandings of the rules policy at that time, a large number of operators with RNAV capability would not have been in a position to use the RNP procedures. As a result, technically some airport PBN procedures would not be accessible for some operators.

I’m pleased to say that the CAA followed this up and now has proposals to “deem” all operators approved for GNSS navigation to be able to undertake both RNAV and RNP procedures at airports. (There may be some small exceptions, but I understand that to be largely the case).

Another area that the report touched on relates to an old saying “the devil is in the detail”. The report suggested that the current descriptions of the new aviation environment, such as the Concept of Operations document, are very helpful (in fact it’s a very good document to generally describe what the world might look like) but there continue to be fresh issues open up as interpretation of that environment through rule development/policy discloses different interpretation when it comes to the detail.

We have found the pace of progress with NSS to sometimes be frustratingly slow (not necessarily a criticism but an observation). I suspect in part, that is through the slow disclosure/discovery of nuances in interpretation of the intentions, that then give rise for more work on clarification or consequential decisions.

The PBN Engagement report suggested that consideration should be given to producing an early exposure draft of the rules (or “straw man” rules) to help flush out differences in interpretation, and deal with the devil in the detail, rather than the traditional rule development process. That is not to shortcut the safety and integrity checks and balances that are needed, but to advance the rule thinking early in the piece. If the exposure draft does its job properly, then the final rule making process through an NPRM should be more straightforward, accepted by industry and less contentious.

Amelia Earhart said "The most effective way to do it, is to do it."

New obstacle limitation surfaces to be protected

Airports manage Obstacle Limitation Surfaces off each end of the runways – to minimise the risk to aircraft safety arising from an obstacle on the approach/departure paths. The Part 139 requirements are based on a regular trapezium shape symmetrically centred on the extended centreline of the runway. These surfaces are described by the airport and published in the District Plans of the relevant local authorities. The land use covered by the Obstacle Limitation Surfaces is then managed under the provisions of the Resource Management Act to minimise land use development that could otherwise be in conflict with those flight paths.

This has historically worked well. However, one of the outcomes of PBN instrument flight procedures is that the procedure can now be a curved approach or departure flight path.

When the flight procedure is designed or checked, an obstacle surface specific to the flightpath is surveyed or checked. In the event of a curved flightpath this surface will most likely be offset to one side of centreline and not symmetrical. To date, it has not been usual for these surfaces to be published in District Plans for management under the RMA. One of our learnings is that this is becoming more important and it should be standard practice to reflect such off-set flight paths, where they exist, in local government District Plans. I understand ICAO are now progressing this in a formal way – but there should be no reason why we don't adopt practices to reflect these surfaces in District Plans.

Summary

Airports are committed to being good corporate citizens, respecting the needs of their neighbours. Airports want to work with those affected by the noise of aircraft operations. They also want to deliver facilities that meet the needs of their customers/users as efficiently and effectively as possible.

In summary the learnings of airports from PBN implementation so far are -

- Collaboration of aviation stakeholders through NSS is effective
- Uncertainty around approvals for RNAV and RNP procedures appears to have been resolved through the planned “deeming” provision.
- The benefits set out in section 3 of the PBN implementation plan are evident and supported.

- Issues concerning the effects of noise on communities under the RMA is now being managed in a structured way, with constructive trials and community engagement.
- Access for some existing services is in question under GNSS due to technical alternate requirements
- Instrument flight procedures at uncontrolled aerodromes remains a potential problem because of the different commercial arrangements for procedures at those airports.
- Obstacle limitation surfaces defined in local government District Plans need to also now protect any off-set (curved) PBN flight procedures where they exist.
- We have learnt that there can be a large gap between descriptions in the Concept of Operations and the subsequent rules being developed. The earlier that gap is identified and addressed the better.