



An Interview with Kevin Bethwaite

Airways' Performance Based Navigation Implementation Manager



got my ATC rating. I spent about ten years in Christchurch tower before moving on to the radar centre and other training standards and sector team leader jobs.

Is what you are doing a natural progression from Air Traffic Controller or is it something you took an interest in and moved into?

It is very much something I took an interest in and pushed to do. Airways did not have anyone doing my role prior to me in 2006 and I have developed it from a part time position to a full time one with a dedicated budget within the Airways modernisation projects.

And back to PBN. Most readers will understand that there's something cool that means they don't get stuck in Queenstown as often as they used to, but don't know much more about it than that. (PBN is an 'in-aircraft' system that uses Global Navigation Satellite Systems (GNSS) – satellite systems that provide navigation information to aircraft systems to allow navigation without ground based systems.)

What was involved/achieved in the initial implementation?

Initially Qantas and Air New Zealand both contracted a company called Naverus to design approaches and departures at QN using this new technology. The result was they could fly into and out of QN when the cloud base was only 500 ft above the runway. These procedures were designed to separate an aircraft from terrain but did not include separating one aircraft from another aircraft so they have limited potential. We have redesigned the holistic system using PBN and included aircraft vs. aircraft separations together with aircraft vs. terrain separations and have more than doubled the capacity of the 'system'.

Currently some aircraft now call the tower asking for a clearance to start - and the tower are giving a 20 to 30 minute delay because another aircraft is arriving and the 'system' just cannot manage. After 15th November this year when the new procedures are effective I don't expect this (delay) to happen.

What does it mean for travellers?

We expect the new system to allow much more 'on time departures'. At least from the Air Traffic Control end we would

not expect someone to say they have an Air Traffic Control Delay. Of course if there are even more aircraft wanting to come and go then there will still be the occasional delay.

It should also dramatically improve the safe management of flights in and out of QN as separations are inbuilt and last minute changes will not be needed.

Have the Airlines been on board with the new system?

It was actually Qantas that kicked it off and Air New Zealand came in pretty much at the same time.

Now Jetstar have obtained certification to fly these RNP AR (Required Navigation Performance – Authorisation Required) procedures as well. Pacific Blue (Virgin) are in the process of establishing certification at this time. The new procedures have this time been commissioned by Airways (rather than airlines) which has enabled a much better overview of the optimum outcome. Come 15th November this year when the revised procedures become effective I expect the four current Jet operators (Air New Zealand, Qantas, Jetstar, and Virgin) to all be using these. New entrants would need approval from Airways and CAA to access these new procedures.

Those without certification will fly new procedures (compared to what is available today) as well but will not have the ability to operate when the cloud is very low. This category needs to establish visual reference to the ground and aerodrome from further away.

What airports have PBN systems in place now, and what is expected in the future?

PBN comes in different forms. Most aerodromes have (basic) PBN procedures whereby aircraft navigate using GNSS (GPS). Many 'conventional' procedures are actually flown using GNSS overlay, a bit like many car drivers now use their TomTom in place of the road map in a book. At the more advanced end of PBN use is RNP AR. There are RNP AR approaches in use at Rotorua and Auckland and a RNP AR Departure used at Wellington.

The PBN implementation program intends to revise all IFR procedure in NZ over the next four to five years. The default system we are targeting is one based on the

use of GNSS. Each controlled aerodrome will retain some VOR-based approach and departure procedures.

A backup network of VOR/DME will be retained, primarily focused on the controlled aerodromes to ensure non-RNAV/RNP operations can be accommodated.

I have been working with Airlines so that we, and they, understand the new navigation equipment aircraft are supplied with versus the older aircraft flying around. We are coordinating the transition from current procedures to the new PBN ones. We are very lucky in NZ that almost 95% of all IFR flights now use PBN, usually GNSS based so we can move forward knowing that aircraft who are 'unable PBN' are able to be managed as a separate group and don't compromise the vast majority.

How did you come to be on the tower at Warbirds Over Wanaka?

I first worked at Wanaka in about 1998 I think. I was asked to do the ATC for the before and after show periods. i.e. Typical Tower ATC managing itinerant aircraft arriving and departing Wanaka. Wanaka is normally uncontrolled (there is no permanent control tower as the traffic is light) but in the two to three days before the show traffic levels increase to a point where it is prudent to have 'normal' ATC service. In the last two shows I have worked for the Warbirds Over Wanaka Show organisation as Assistant Display Director, managing the aircraft ground and airborne activity for the period of the show itself.

Who else is on your team for the airshow?

Airways can provide a specialist team to control itinerant traffic before and after air-shows. James Pengelly is currently the head of this and other team members are picked from around the regional towers in the country. They will all be people who have plenty experience and are used to busy traffic. At the 2010 and 2012 shows Barry Brunton has had the principal Display Director role.

How much preparation is involved (NOTAMs and stuff) as well as getting the team together and making it work on the day?

Barry does all the hard stuff getting the documentation right. i.e. the legal and formal stuff. He also attends all the pre-show meetings the organisers need to have as the show programme is being developed. I always try to attend some meetings to keep fully in the loop in case ad-hoc decisions need to be made whilst the show in progress. We have a strong focus on maintaining safety whilst facilitating the activity of entertaining the public.

Whilst we always strive to keep to the programme, in practice changes are made that should not be obvious to the public.

What's the best bit?

The time immediately after each days 'performance' when you know that it went well. Whilst the program itself is designed to run without 'massage', as I have said things never go exactly to plan and if all your decisions have helped make the show that much more continuous, exciting, and safe then that's a buzz.

Is it fun?

I'll give you a good controller's answer - When I'm in control, yes it is fun and extremely satisfying. When events happen that start to test your control, it's not fun but that's when your experience is most valuable.

Like many people involved in the aviation industry, Kevin Bethwaite has an aeronautical hobby. A glider pilot since 2004 he works hard to give something back to his sport. He is the President of the Canterbury Gliding Club, the fastest growing gliding club in the country.

How did you get into gliding?

It was entirely due to my brother Warwick. He rang me the day he got his C-cat glider instructor rating and said, "Come on. You are going to be my first pupil." I went out to Wigram the next Saturday and loved it instantly. I wrote out a cheque for my membership and a fixed charge flying scheme on the spot.

Has gliding affected what you do at work?

Gliding has given me so much more awareness of 'energy management' in flight. I truly believe it is the single biggest asset I bring to my Aeronautical Procedure Development role. A key component of the design of new flight tracks, especially in the arrival phase is to minimise fuel burn and noise. To do this an airliner ideally needs to reduce power at the top of the descent and 'glide', with no added thrust, all the way to touchdown at a runway.

Kevin, thank you for your time.

THE SECOND person in the spotlight in our new interview series is Airways' Performance Based Navigation Implementation Manager, Kevin Bethwaite. Jill McCaw asked Kevin to talk about what he does, what that long title means and a bit about his role at the Warbirds Over Wanaka Airshow. Then of course we had to ask him what he does for fun.

What's your title and what does it mean?

I'm Airways' Performance Based Navigation Implementation Manager. I manage the introduction of what's called Performance Based Navigation (PBN) in New Zealand's Domestic Airspace. Specifically this involves the introduction of new air routes including arrival, approach and departure procedures. I coordinate a lot of other people with different specialist jobs. For instance I'm the link between the Air Traffic Control system and the Airlines. I'm like an architect who has a wide knowledge of a topic and a creative skill but I need many other specialists to take my concepts to the finished product.

What's your background in the business?

I have been in Air Traffic Control all my working life. I joined (the Ministry of Transport) as an Air Traffic Control Cadet in 1968 on leaving high school.

How much time have you spent on the tower?

I've spent time in pretty much every operational capacity that Air Traffic Controllers do, including being a Tower Controller at Nelson, Woodbourne, and Invercargill for short periods when I first



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