Australian Airline Pilots' Association
Member of IFALPA

Suite 6.01, Level 6
243-249 Coward Street
Mascot NSW 2010
T. +61 2 8307 7777
F. +61 2 8307 7799
E. office@ausalpa.org.au

By Electronic Transmission

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Lachlan Phillips
Acting General Manager – Aviation Environment Branch
Aviation and Airports Division
Department of Infrastructure and Regional Development
GPO Box 594
CANBERRA ACT 2601

Email: safeguarding@infrastructure.gov.au

Dear Lachlan,

AUSALPA COMMENTS ON THE NATIONAL AIRPORTS SAFEGUARDING FRAMEWORK DRAFT GUIDELINE - *MANAGING THE RISK IN PUBLIC SAFETY ZONES AT THE ENDS OF RUNWAYS*

The Australian Airline Pilots' Association (AusALPA) represents more than 5,000 professional pilots within Australia on safety and technical matters and we welcome the opportunity to contribute to improvements in aviation security in Australia.

AusALPA is the Member Association for Australia and a key member of the International Federation of Airline Pilot Associations (IFALPA) which represents over 100,000 pilots in 100 countries. Our membership places a very strong expectation of rational, risk and evidence-based safety behaviour on our government agencies and processes. We regard our participation in the work of the Department of Infrastructure and Regional Development (DIRD) as essential to ensuring that our aviation and airports policy makers get the best operational safety and technical advice that is completely independent of the vested commercial interests that currently dominate Australia's aviation regulation decision-making.

Our Commitment

More than any other stakeholders, our members sample the positives and negatives of our approach to airport safeguarding every day. Consequently, AusALPA is committed to the NASF and the Guidelines as well as the long-term strategy of a single broad-based national approach to safeguarding aviation infrastructure at all levels of government across Australia.

The Downside of Federalism

AusALPA is entirely sympathetic to the difficulties faced by DIRD in trying to influence the States to adopt robust safeguarding measures for our aviation infrastructure. While we understand that the States are wary of the economic consequences of various safeguarding proposals, history already tells us that failure to act decisively and at the first opportunity will not be forgiven in the aftermath of a major accident.

We were astounded to discover that the UK, following the recommendations of the Committee on Safeguarding Policy (the Le Maitre Committee), has had Public Safety

Zones (PSZs) in place at major UK airports since 1958. The US has had the equivalent prior to 1989 and the Netherlands reviewed their existing policy settings following the 1992 El Al crash after take-off that killed 39 people on the ground.

While we note that DIRD has been trying to get agreement from the States on PSZs for about a decade, AusALPA strongly suggests that the NASAG should closely ponder on the irony that we in Australia will still not have national PSZ planning restrictions in place some **60 years** after the Le Maitre Committee in the UK provided all the necessary public safety policy considerations. NASAG should take no comfort in Australia's good fortune in regard to major aviation accidents and certainly should not continue to prevaricate in establishing a universally stringent set of safeguarding rules.

Our Major Concerns

Our major concerns in this particular safety/public risk debate are about the extent to which both the economic consequences and the size of the affected population may be understated in order to nudge the risk management aspects across the line.

Economic Consequences

The Covering Document states:

> The introduction of a PSZ will not have any impact upon existing properties.

While it may be true that existing land use remains unaffected under this proposal, the principled approach set out in the UK Department of Transport Circular 01/2010 Control of Development in Airport Public Safety Zones includes:

> The basic policy objective governing the restriction on development near civil airports is that there should be no increase in the number of people living, working or congregating in Public Safety Zones and that, over time, the number should be reduced as circumstances allow.

The proposed Guideline appears to be ignoring this issue as well as the fact that any future planning restrictions will have a material effect on property values, especially where lucrative redevelopment options will now be prevented. AusALPA suggests that these economic consequences, while regrettable, are nevertheless necessary for the greater public good.

Spatial Considerations

AusALPA is particularly concerned about this quote from the Covering Document and its apparent influence on the Draft Guideline:

> Data collated by the International Civil Aviation Organization indicates that, while statistically very low, accidents that occur during the take-off or landing phase are most likely to occur within 1km before the runway on landing or within 500m beyond the runway end on take-off.

We are concerned because the dataset and the basis for these conclusions are not identified in the document and are not readily found in extensive internet searches. For example, the only ICAO work cited in the early NLR studies (see NLR CR-2000-147) was a 1980 document, since withdrawn.

Our own research into the accident location data suggests that the unsubstantiated "most likely to occur" statement is statistically and evidentially problematic, particularly in regard to take-off overshoot and landing undershoot accidents. We have attached two pages extracted from NLR CR-2000-147 that amply demonstrate the inaccuracy of this unsubstantiated and misleading assertion.

The documented outcomes of the UK and Netherlands approach suggest that the $1:10^5$ public risk boundary often extends to around three or four times this distance at high traffic runways. We have attached a clear and relevant figure from NLR TP-2013-550 that of itself clearly illustrates that using 1000m as a filter for development consideration as stated in paragraphs 56-59 of the Draft Guideline is, while better than nothing, is a most inappropriate distortion of the public risk.

Is NASAG Showing Leadership?

While we note the politics of Commonwealth/State cooperation attendant upon land use issues and we recognise the difficulties in even getting this far, AusALPA is strongly of the view that the NASAG needs to free itself of excessive dependence on past decisions and to avoid the "two bob each way" approach taken in this draft:

> The approach to PSZs in Australia, through the proposed new NASF Guideline, provides flexibility for state/territory governments to be proactive and identify and map PSZs at airports, or take a reactive approach and consider public safety risk on a case-by-case basis in response to development proposals in close proximity to airport runways.

There needs to be acceptance of the history of poor safeguarding decisions in the past. However, we need to move forward by ensuring that we take positive steps to reduce the readily foreseeable risks. The introduction of a single uniform approach to PSZs for all significant airports is one such step.

Queensland's PSZ Legacy

AusALPA applauds Queensland for their leadership in airport safeguarding. We have no doubt that the Queensland public has been far better served in regard to public risk management at their airports than can be said of any other Australian State.

Nonetheless, the current approach to PSZs in Queensland is deficient to the extent that it is inconsistent in applying land use restrictions to areas of identical risk. While AusALPA would dearly like to understand the rationale for truncating the PSZ at 1000m along the centreline beyond the threshold, the reality is that the full extent of the risk contours have been known for decades and inappropriate development at 1001m on the centreline may well be at far greater risk than developments located closer than 1000m but further off the centreline.

AusALPA therefore questions whether offering the Queensland example as a future option for other States is defensible, given that NASAG knows the model is deficient.

Western Sydney Airport

AusALPA is disappointed that the Western Sydney Unit and DIRD were unwilling or unable to negotiate with NSW to implement a full set of untruncated PSZs at Western Sydney Airport, despite it being a greenfields site with essentially no legacy land use planning problems.

In effect, the Commonwealth has undermined any future agreement to fully risk-based PSZs by opting for a truncated zone which ignores the real risk contours. Moreover, that decision opens the door for incompatible land use options just beyond 1000m that may also fail the societal risk tolerance that is otherwise avoided by population density controls.

The statement at paragraph 8 on page 13 of the Draft Guideline is demonstrably untrue: the so-called 1000m 'clearance zone' does not "cover the area of highest safety risk".

International Standards

The covering document states that: "There is no international standard promulgated by the International Civil Aviation Organization (ICAO) for PSZs." However, while that statement is accurate, it is not complete. ICAO does provide some guidance in Chapter 5 *Land Use Planning* of Part 2 *Land Use and Environmental Control* of ICAO Doc 9184 *Airport Planning Manual* (3rd edition). While that guidance in Doc 9184 basically describes only the Netherlands process, it also mentions other circumstances where external risk assessment is required.

In any event, AusALPA views the ICAO approach as entirely supportive of the production of appropriate risk contours, as distinct from "one size fits all" templates that are of varying correlation with the real risk to the public.

US DoD Accident Potential Zones

While recognising the value of the Annex A to Attachment 3 to the Draft Guideline, AusALPA does not believe that the illustrated public safety areas are appropriate for the Australian NASF. The US classification of runways as the controlling variable is naive and over simplistic – it is not consistent with Australian aviation infrastructure usage or consequence modelling and the areas appear to significantly exceed that required by the iso-risk contours.

World's Best Practice

We recognise that there are a number of ways various jurisdictions approach PSZs. Some approaches (US DoD, QLD) are clearly deficient while there remains some debate about whether individual or societal risk assessments are preferable. However, "world's best practice" is most often a function of popularity rather than absolute quality – NASAG should just choose a single approach to be uniformly applied across Australia in the full knowledge that others will consider our choice to help elevate that approach to "world's best practice".

Centralised Modelling of Risk Contours

AusALPA notes from the literature that NATS became the dominant provider of the risk modelling and contour production for UK runways (and internationally on contract). Competition and transparency issues aside, the immediate and obvious benefit in the UK is that the outcomes were and are standardised. Similarly, we became aware that from 2006 the UK Health and Safety Executive (HSE) "has been providing all planning authorities in England, Scotland and Wales with on-line access to the (risk assessment) software it has developed to generate its land use planning advice, known as PADHI (Planning Advice for Developments near Hazardous Installations), so that they can generate the health and safety advice more quickly and efficiently themselves…".

It seems to us that public safety would be enhanced and that PSZ decision-making would be made more efficient and standardised if one agency (preferably DIRD) became the sponsor and supplier of mutually acceptable iso-risk contours for all Australian airports. AusALPA notes that, as we have limited aviation infrastructure compared to the UK, the creation of a centralised source should neither be expensive nor overly demanding.

Conclusions

AusALPA applauds the introduction of PSZs at all significant airports (not just ex-Commonwealth airports).

The PSZs should be defined by iso-risk contours generated by appropriate risk modelling. While the current emphasis is on the assessment of individual risk, existing inappropriate land use may mandate consideration of societal risk assessments as well.

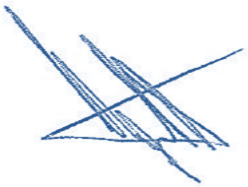
AusALPA does not accept 1000m as a valid parameter for truncating the length of PSZs or as a filter for determining the need for development assessments.

AusALPA is disappointed that the Draft Guideline is not more focused on a single uniform approach to defining PSZs.

AusALPA is disappointed that Western Sydney Airport has adopted a known deficient PSZ template that ignores areas of equal risk and, by so doing, has undermined any potential Commonwealth leadership in implementing PSZs.

AusALPA suggests that NASAG adopt a common risk assessment model such as used in the UK and, further, that the model is maintained and operated by a single, mutually accepted agency.

Yours sincerely,



Captain Murray Butt
President AusALPA
President AIPA

Captain David Booth
President AFAP

Tel: +61 – 2 – 8307 7777
Fax: +61 – 2 – 8307 7799

Email: office@ausalpa.org.au
government.regulatory@aipa.org.au

Attachments:
1. Pages 18-19 from NLR-CR-2000-147 *An enhanced method for the calculation of third party risk around large airports*, NLR April 2000
2. Figure 7 from NLR-TP-2013-550 *Development of NLR third party risk model and its application in policy and decision-making for the airports in the Netherlands*, NLR December 2013

Table 3-1: Number of data points per source and per category.

	Overshoot	Take-off overrun	Undershoot	Landing overrun	Veer-off	*Exclude*	**Total**
ADREP	67	35	109	67	74	*326*	678
ALPA	29	61	296	164	211	*46*	807
Airclaims	5	--	21	2	--	*4*	32
NTSB	5	3	9	4	11	*27*	59
CAA	--	4	--	18	--	*4*	26
Total	106	103	435	255	296	*407*	**1602**

3.1.2 Analysis

Scatter plots of the accident data per category can be found in the following figures. The *x*-axis represents the extended centreline.

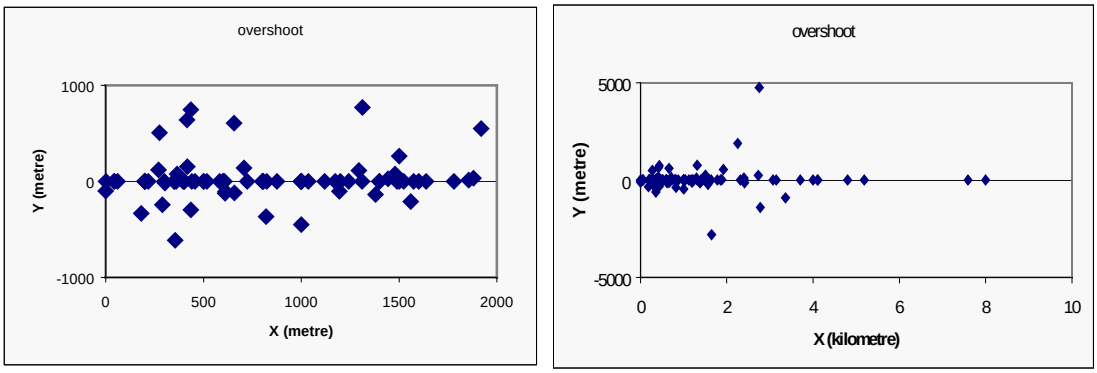


Figure 3-1: Scatter plots of overshoot data points (left: zoomed in).

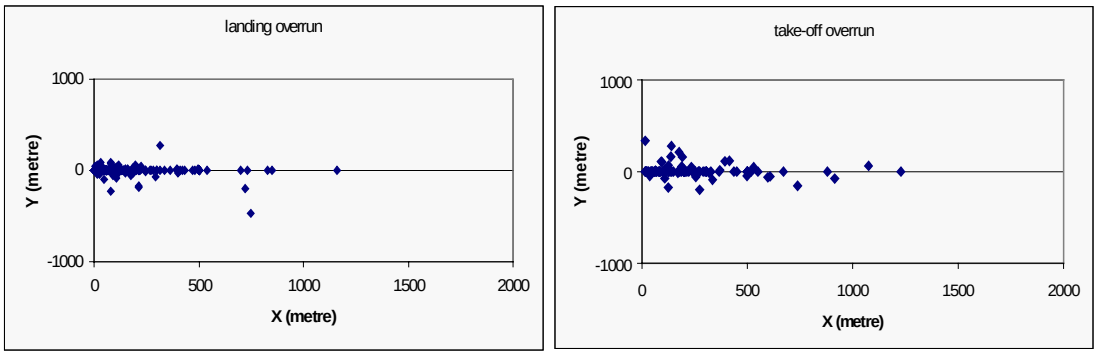


Figure 3-2: Scatter plots of overrun data points (left: landing, right: take-off).

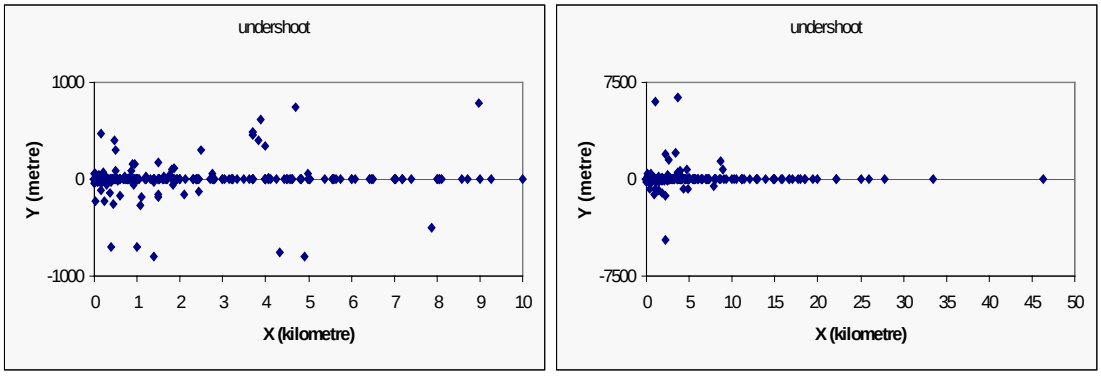


Figure 3-3: Scatter plots of undershoot data points (left: zoomed in).

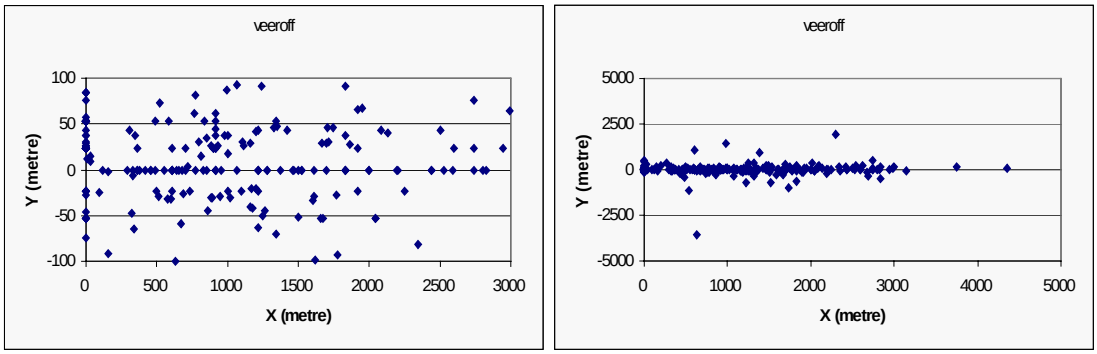


Figure 3-4: Scatter plots of veer-off data points (left: zoomed in).

Points on the extended centreline

Each of the five subsets contain a significant number of points on the extended centreline, *i.e.*, with *y*-co-ordinate equal to 0. A few possible explanations come to mind:

1. Accidents really do frequently occur on the extended centreline;
2. The value *y*=0 is used by accident investigators when accidents occur close to, but not necessarily on the extended centreline;
3. The accident location is given in only one co-ordinate, being the distance to the airport, and the value *y*=0 is inadvertently assigned when transforming to the two-dimensional co-ordinate system.

There may be more reasons that explain the phenomenon.

Only for a small number of accidents it can be show that the accident location was exactly on the extended centreline. More often it seems that the actual accident location is close to the centreline, for instance when the accident aircraft did not show any defects. Especially for accident locations at great distances from the airport it is most likely that the transformation from one to two dimensional representation of the location is the cause for the value *y*=0.

FIGURE 7 FROM NLR-TP-2013-550 *DEVELOPMENT OF NLR THIRD PARTY RISK MODEL AND ITS APPLICATION IN POLICY AND DECISION-MAKING FOR THE AIRPORTS IN THE NETHERLANDS*, NLR DECEMBER 2013

[The 1:10^5 risk boundary for runway 18R at Schiphol extends to approximately 4460m from the runway threshold. The Turkish Flt 1951 accident site is approximately 1600m from the runway threshold. While this contour is specific to this runway and traffic mix, it is perhaps similar to those for Sydney and Melbourne and potentially Brisbane and illustrates the inappropriateness of limiting PSZs to 1000m when considering actual risk contours.]

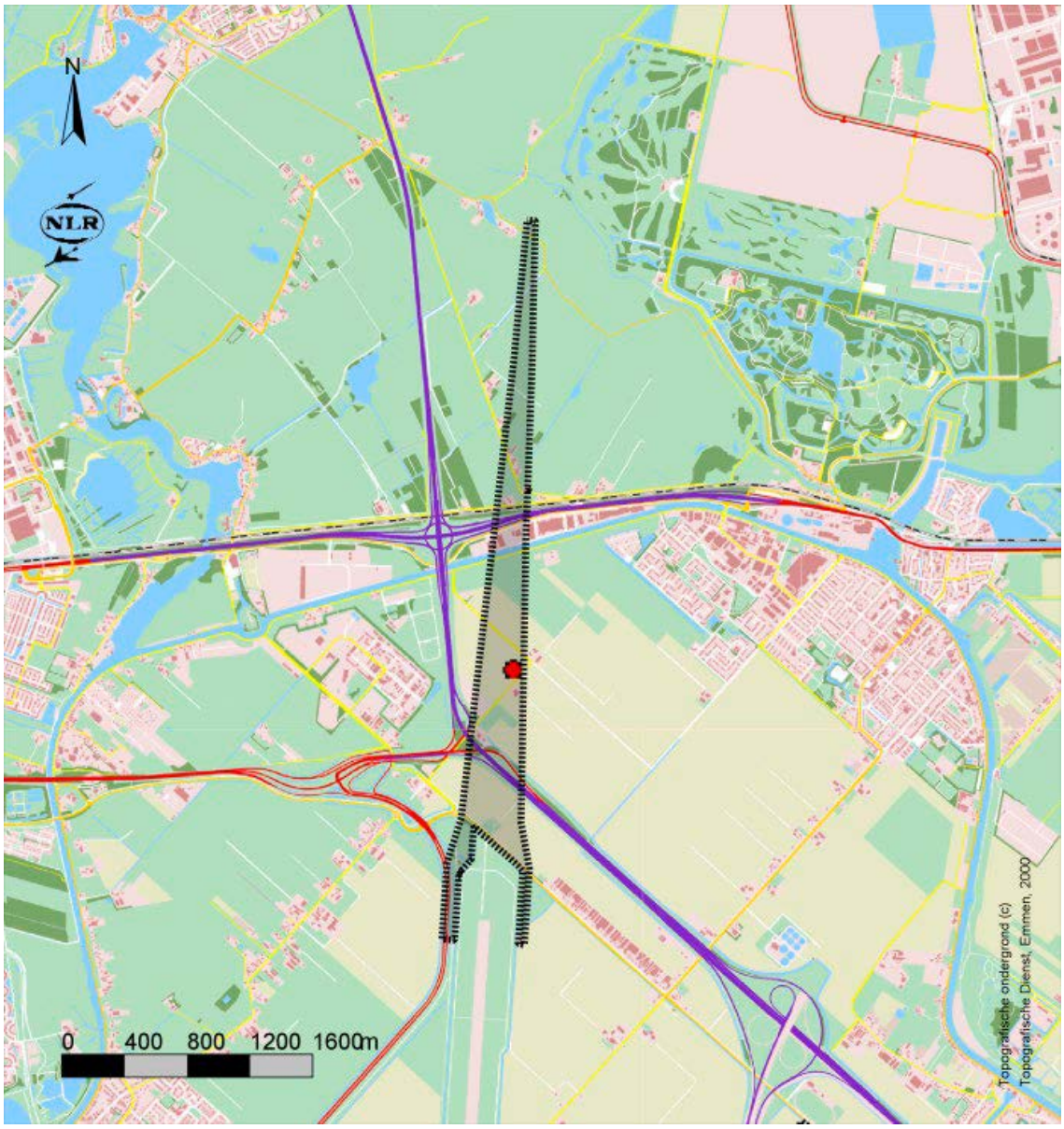


Figure 7. *The crash site of Turkish Airlines aircraft on 25 February 2009 (red circle), Flight 1951, lied at the north of runway 18R of Amsterdam Schiphol Airport. Depicted in the figure are the crash site (red dot) and the Restricted Area 1 (in grey shade) as established in the Airport Layout Decree of Schiphol Airport*