



**AIRSERVICES RESPONSE TO THE REVIEW OF
MELBOURNE LAND AND HOLD SHORT OPERATIONS
(LAHSO) SAFETY ASSURANCE**

MAY 2015

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1. Introduction

A comprehensive review of LAHSO operations at Melbourne Airport was undertaken by the Safety, Environment and Assurance group within Airservices Australia.

The review was undertaken from November 2014 through to March 2015. Airservices has subsequently accepted all recommendations of the review, has presented the findings to the Airservices Board and has commenced work to address the recommendations. Airservices response to the recommendations and the current status is set out in Section 4 of this overview.

2. Overview

Airservices Australia (Airservices) has an ongoing commitment to deliver safe, customer-focused, efficient and environmentally sustainable air navigation and aviation rescue and fire fighting services.

Airservices takes its safety performance seriously and it is this commitment to safety that saw Airservices initiate a targeted review of the Land and Hold Short Operations (LAHSO) at Melbourne Airport once questions were raised relating to an aspect of this operation.

LAHSO is an internationally recognised procedure that is subject to stringent safety standards and training requirements. It has been in use in Australia for more than 20 years and continues to be used for safe and efficient air traffic management in countries such as the United States and Canada to reduce congestion and delay during periods of high traffic demand.

The review of LAHSO commenced in November 2014 and included a review of procedures and practices. The review followed an initial assessment of a pilot complaint relating to the crosswind and downwind limitations for LAHSO at Melbourne. The assessment identified that the current Aeronautical Information Publication (AIP) permitting a pilot to request any runway irrespective of wind conditions could possibly lead to confusion. A temporary local instruction was issued on 7 November 2014 to reinforce to controllers that the crosswind and downwind restrictions for runway nomination applied to both the active and passive LAHSO participants.

A comprehensive review was then initiated to examine LAHSO practices at Melbourne airport and to assess the application of the Airservices Safety Management System (SMS) to the change management of local LAHSO procedures. The review also analysed relevant occurrence data for a period of almost two years to identify whether any changes had impacted on the safety of LAHSO at Melbourne.

What is LAHSO?

LAHSO involves aircraft landing and holding short of a crossing runway to improve airport capacity and air traffic system efficiency while maintaining appropriate levels of safety. LAHSO is only available to operators who have received authorisations from the Civil Aviation Safety Authority (CASA) to participate in the procedure. During LAHSO, the aircraft which is issued a hold short requirement is classified as the 'active participant', and the aircraft which has unrestricted use of the full length of the crossing runway is classified as the 'passive participant'.

The conditions by which air traffic controllers (ATC) nominate a preferred runway include crosswind and downwind criteria. The Manual of Air Traffic Services (MATS) requires controllers to nominate on the Automated Terminal Information Service (ATIS) the runways in use for arriving and departing aircraft. For active participants in LAHSO, the Civil Aviation Safety Regulations (CASR) Part 172 Manual of Standards (MOS) and MATS specify additional restrictions on runway nomination and use. This includes a restriction where the crosswind component including gusts does not exceed 20 knots regardless of pilot intentions.

3. Findings

Ad-hoc LAHSO

The review confirmed that LAHSO at Melbourne complied with CASR Part 172 MOS and MATS when operating in the 'high capacity landing (LAHSO) runway modes'.

However, there were inconsistencies in the interpretation of procedures or requirements when aircraft were allowed to participate in LAHSO on an ad-hoc basis during other preferred runway modes (referred to as 'ad-hoc LAHSO'). This resulted in situations where the crosswind/downwind for the passive LAHSO participant runway could exceed the wind limitations for ATC runway nomination criteria and that the specific runway was not broadcast on the Automatic Terminal Information Service (ATIS). Between 1 January 2012 and 31 October 2014, there were 12 instances during LAHSO operations where aircraft landed in excess of the crosswind or downwind limitations for ATC runway nomination. The ultimate decision to operate with any specific crosswind always rests with the crew and most commercial aircraft are certified for much higher crosswinds.

The ad-hoc LAHSO operations included the following scenarios:

- Runway 27 nominated as the preferred runway mode, and aircraft might be offered to land on the crossing Runway 34 (as the active LAHSO participant) with the expectation to land and hold short of Runway 27. In this scenario both runways would meet the prescribed wind conditions (for the nominated runway mode and active LAHSO participant).
- Runway 34 nominated as the preferred runway mode, and aircraft might be offered to land on the crossing Runway 27 or 09 as the passive LAHSO participant. In this scenario, a pilot could accept the option to land on runway 27 or 09 with wind conditions in excess of the runway nomination criteria for crosswind/downwind (i.e. 20knots/5knots respectively). This scenario was the subject of Senator Nick Xenophon's concern relating to LAHSO. Ad-hoc use of runway 27 was rarely used due to potential conflicts with departures from Essendon runway 35. The ad-hoc use of runway 09 was more prevalent.

During ad-hoc LAHSO, the active participant runway was broadcast on the ATIS. However the off-mode crossing runway (for the passive LAHSO participant) was not broadcast on ATIS. The broadcast of LAHSO on the ATIS without reference to the dependent passive runway provides incomplete information to participant pilots.

The review identified that there is no definition for 'ad-hoc LAHSO' in CASR Part 172 MOS, MATS or AIP. Further, the existing rule sets did not explicitly prescribe the crosswind/downwind limitations for the passive LAHSO participant. As a result, there was a lack of shared understanding of the ad-hoc LAHSO rules and practices.

Application of SMS for changes to Melbourne LAHSO

The runway 34/09 LAHSO mode was removed on 5 November 2011 when construction of the new Melbourne control tower reduced the line of sight for controllers. In May 2014, the runway 34/09 LAHSO mode was reintroduced following relocation to the new Melbourne control tower.

In November 2012, Airservices completed a Safety Assessment Report (SAR) to assure the safety of ongoing LAHSO and Converging Runway Operations (CROPS). The scope of the SAR was limited to current operations and did not include runway 34/09 LAHSO because it was not in use at the time. As a result any inconsistencies in the interpretation or application of ad-hoc LAHSO were not identified during the SAR preparation.

The current review determined that the safety impact of the removal and subsequent re-introduction of runway 34/09 LAHSO mode was not rigorously assessed using the Safety Case Assessment and Reporting Determination (SCARD) process under Airservices Safety Change Management Requirements (AA-NOS-SAR-0104).

The review also identified a number of other potential missed opportunities to clarify and standardise LAHSO practice.

Analysis of occurrence data

The air traffic services (ATS) occurrence data was analysed for the period from 19 November 2012 to 31 October 2014. There was no evidence available to suggest the occurrences were a result of LAHSO procedures. No air traffic controller or pilot reports or complaints were received during this period.

4. Actions underway to implement the recommendations

The Review made a number of recommendations relating to LAHSO procedures, staff training and support for safety change management, and additional risk assessment and data modelling for all runway modes used for LAHSO.

We have accepted all the recommendations and are working to address them. The table below details the status of the actions arising from the recommendations of the review as at May 2015.

Action Reference	Action	Status
ACT-0006907	<p>1. Conduct a review of the definitions and terminology contained in national standards, rule set and procedures to ensure consistency and application intent including:</p> <ul style="list-style-type: none"> • The CASA Manual of Standards (MOS) Part 172 • The Aeronautical Information Publication (AIP) Australia • The AIP (SUP) Differences from ICAO Standards, Recommended Practices and Procedures (H18/14) • The Manual of ATS Services (MATS) 	<p>A review of the relevant documentation has been completed and has resulted in amendments to the MATS to ensure consistency and alignment.</p>
ACT-0006909	<p>2. Conduct a review of LAHSO procedures and practices at Melbourne and Adelaide to ensure the application is consistent with the intent of the CASA Manual of Standards (MOS) Part 172, the Aeronautical Information Package (AIP) and the Manual of Air Traffic Services (MATS).</p>	<p>Review activities are underway to identify and address any inconsistencies with current practices and/or procedures.</p> <p>Interviews are underway with Air Traffic Controllers to determine any differences in procedures and/or practices with the MOS Part 172 requirements.</p>
ACT-0006924	<p>3. Conduct a risk assessment of all LAHSO procedures and practices at Melbourne using additional top-down and bottom up techniques as described in AA-GUIDE-SAF-0105C to ensure the identification and assessment of all potential failure modes associated with all operational airspace and runway mode configurations.</p> <p>The assessment is to be incorporated as an addendum to the Land and Hold Short Operations (LAHSO) and Converging Runway Operations (CROPS) All Phases Safety Assessment Report (SAF-</p>	<p>A risk assessment is being undertaken using detailed aircraft traffic scenarios at Melbourne and Adelaide incorporating both quantitative and qualitative data analysis.</p>

Action Reference	Action	Status
	SAR-12009). In addition, The Melbourne Tower and TCU Operational Risk Assessments (ORA) are to be reviewed as necessary.	
ACT-0006925	<p>4. Complete a reassessment of the data modelling completed for the Melbourne Go-Around Study (Safety & Assurance Group - June 2013). The assessment should incorporate further analysis, including environmental conditions (crosswind/downwind components) and available data from 2012 to 2014 for all LAHSO runway modes including 34/09.</p> <p>The assessment is to be incorporated as an addendum to the Land and Hold Short Operations (LAHSO) and Converging Runway Operations (CROPS) All Phases Safety Assessment Report (SAF-SAR-12009). In addition, the Melbourne Tower and TCU Operational Risk Assessments (ORA) are to be updated as necessary.</p>	A re-assessment of the data modelling has been completed and a progress report has been developed and circulated for review prior to management endorsement.
ACT-0006910	<p>5. Conduct a review of the training and support for personnel with National Request for Change (NRFC) safety management roles and responsibilities to ensure safety change is managed in accordance with Safety Change Management Requirements (AA-NOS-SAF-0104).</p>	<p>The review is nearing completion and has identified further training opportunities for staff to fulfill the requirements for non-project related change.</p> <p>Targeted training for staff is due to commence in October 2015.</p>
ACT-0006911	<p>6. Implement a scheduled programme of operational surveillance activities of sufficient scope and periodicity to provide assurance that the application of procedures and practices remain consistent with national standards and the rule set.</p>	Scheduled reviews are due to commence in September 2015.
ACT-0006912	<p>7. Conduct a study to determine whether alternative means of air traffic segregation (such as dependent runway operations) could be safely applied in Melbourne and Adelaide without material reductions to capacity.</p>	Simulator exercises and data modelling is being undertaken to evaluate the feasibility of adopting dependent runway operations.