



**Australian Government**

**Australian Transport Safety Bureau**

# Landing on closed runway involving Cessna 510, VH-MSU

Temora Aerodrome, New South Wales, on 21 October 2021

## **ATSB Transport Safety Report**

Aviation Occurrence Investigation (Short)

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#### Addendum

Page	Change	Date

# Safety summary

## What happened

A privately operated Cessna 510 Citation Mustang aircraft, registered VH-MSU, was flying from Sunshine Coast airport, Queensland to Essendon Airport, Victoria with a planned stop at Temora Aerodrome to refuel. At about 1857 Eastern Daylight Time, the pilot landed on runway 18 at Temora Aerodrome. On touchdown, the pilot noticed unserviceability markers further along the runway and elected to continue the landing. The pilot slowed to taxi speed and left the runway to refuel prior to reaching the markers. While refuelling, the pilot checked the NOTAMs for Temora Aerodrome and found that runway 18/36 was closed due to runway works.

## What the ATSB found

The ATSB found that during pre-flight planning, the pilot dismissed NOTAMs that were deemed irrelevant to the planned operation. This included one stating that runway 18 was closed due to works in progress, which was deemed irrelevant due to the planned landing on runway 05. The pilot did not review NOTAMs when considering changes to the plan during flight. During approach and landing, the pilot did not see evidence of runway works or closure until touchdown and judged that they would be able to stop before the cones.

White crosses had been placed on the runway, but not in locations visible to aircraft conducting a straight-in approach on runway 18. The size and number of unserviceability markings along the runway were insufficient to fulfil the requirements of the Civil Aviation Safety Regulations Part 139 Manual of Standards (MOS) for closed runways.

## What has been done as a result

Temora Aerodrome now has obtained larger unserviceability markings. The pilot has adjusted their in-flight decision-making process to check all NOTAMs for an aviation facility when plans change.

## Safety message

An essential component of pre-flight planning is to check all NOTAMs relevant to the planned flight, and potential changes to the plan. This includes all NOTAMs regarding all aviation facilities that a pilot plans to use.

To ensure clear communication of changes that may affect the safety of aircraft operations, aerodrome operators must ensure that all works are conducted, and markings displayed, in accordance with the current Civil Aviation Safety Regulations Part 139 Manual of Standards (MOS) for aerodromes.

# The investigation

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope investigation was conducted in order to produce a short investigation report, and allow for greater industry awareness of findings that affect safety and potential learning opportunities.

## The occurrence

On 21 October 2021, the pilot of a Cessna 510 Citation Mustang aircraft was conducting a private flight from Sunshine Coast Airport, Queensland to Essendon Airport, Victoria with 4 passengers on board. During pre-flight planning, the pilot checked the weather and NOTAMs,<sup>1</sup> and decided to make a refuelling stop due to diversions around a thunderstorm system in south-east Queensland. The pilot identified Temora Aerodrome, New South Wales (NSW), as an appropriate stop and after calling the fuel provider and checking NOTAMs, planned to land on runway 05 due to weather conditions at the aerodrome.

During cruise, the pilot tuned into the Aerodrome weather information service (AWIS)<sup>2</sup> at Temora Aerodrome and made the decision to land on runway 18 instead of runway 05 due to changes in wind direction and apron accessibility. The pilot did not hear any broadcasts on the Common Traffic Advisory Frequency (CTAF)<sup>3</sup> and elected to land straight-in with a 5-mile final approach to save on time and fuel.

On touchdown, at about 1857 local time, the pilot noticed cones (unservicability markers) across the runway a long distance ahead of the threshold. They elected to continue the landing after judging that there was sufficient runway to stop safely. The unservicability markers were located 700 metres from the threshold, just south of intersection D on runway 18/36 (see 'Locations of unservicability markers' in Figure 1). The pilot did not see any other visible markings or obstructions on the runway to indicate that it was closed.

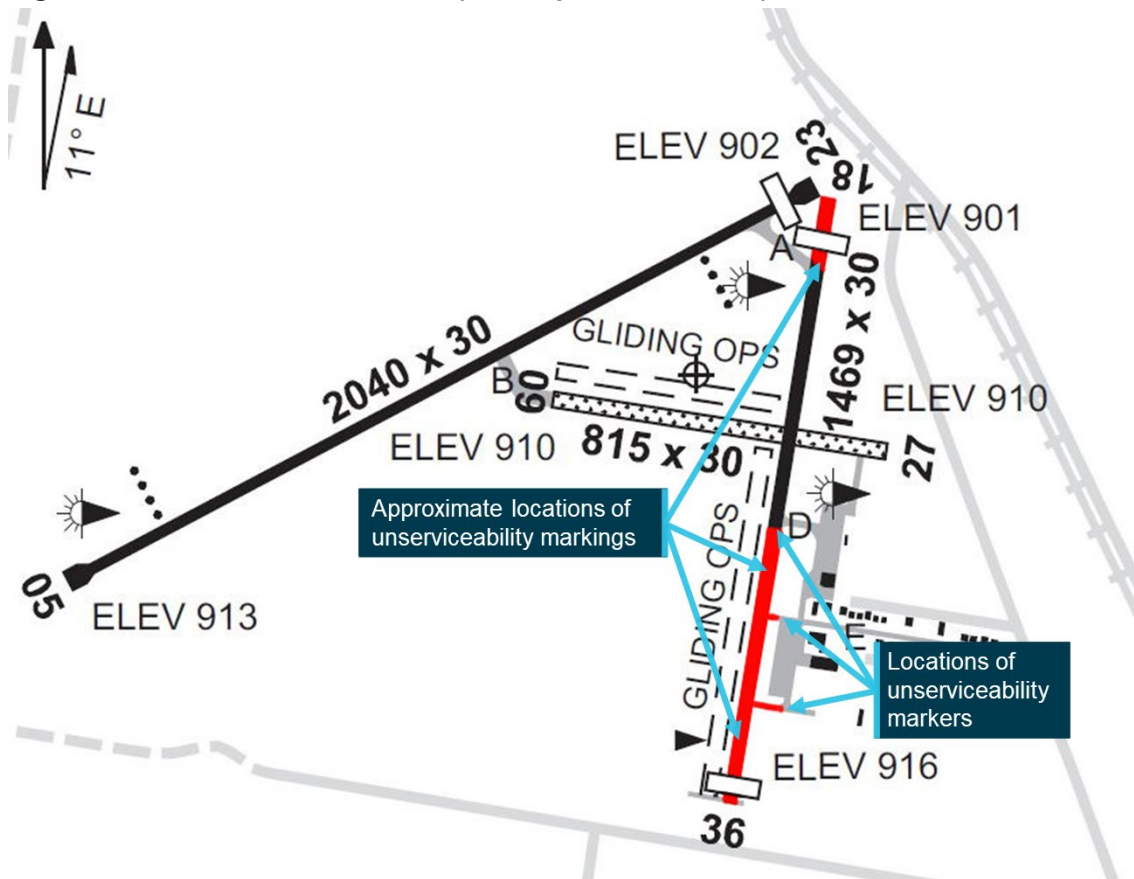
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<sup>1</sup> NOTAM: A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

<sup>2</sup> Aerodrome weather information service (AWIS): actual weather conditions, provided via telephone or radio broadcast, from Bureau of Meteorology (BoM) automatic weather stations, or weather stations approved for that purpose by the BoM. [AIP GEN 3.3 – AIR TRAFFIC SERVICES, Section 2 FLIGHT INFORMATION SERVICE (FIS), paragraph 2.9 Aerodrome Weather Information Service (AWIS) and Weather and Terminal Information Reciter (WATIR)]

<sup>3</sup> Common Traffic Advisory Frequency (CTAF): A designated frequency on which pilots make positional broadcasts when operating in the vicinity of non-controlled aerodromes.

Figure 1: Temora Aerodrome chart (closed pavement in red)



Source: Airservices Australia, annotations by the ATSB

After landing, the pilot re-checked the NOTAMs and found that runway 18/36 was closed but available for use as a taxiway. The pilot re-fuelled the aircraft and, while taxiing for departure on runway 23, looked for any unserviceability markings near intersection A but did not see any. The pilot departed at about 1920 local time.

## Context

### Temora Aerodrome

Temora Aerodrome was a certified and non-controlled aerodrome located in southern NSW. It had two asphalt runways, one dirt runway and two grass runways for glider operations. It was primarily used by the Temora Aviation Museum and Temora Aero Club.

Runway 05/23 was 2,040m long and runway 18/36 was 1,469m long. Both runways were 30m wide.

### Runway works

Works began on 5 October 2021 to construct a link taxiway to the threshold of runway 23 and complete drainage works at the southern end of runway 18/36. Works were planned to be completed by 30 November 2021. During this time, runway 18/36 was closed. About 640 metres of this runway, between taxiways A and D, continued to be available as the sole taxiway for runways 05/23 and 09/27. At the time of the incident, works markings and a NOTAM outlining these changes to the operation of the airport were active.

### Aerodrome markings

A combination of unserviceability markers (cones) and markings (crosses) had been placed on the aerodrome as annotated in Figure 1.

Unserviceability markers, consisting of 50cm high white cones with a red band, were placed at the end of taxiways E and F entering runway 18/36, and across runway 18/36 south of taxiway 'D', to prevent aircraft taxiing into the works area.

Three unserviceability markings, constructed with 6-metre-long white lines laid as a cross, were placed on the runway:

- 116 metres north of the threshold of runway 36
- halfway between taxiways D and E, and
- 42 metres south of the runway 18 threshold, between the numbers and 'piano-keys'.

The distances between these markings were 431 and 750 metres.

### Unserviceability markings

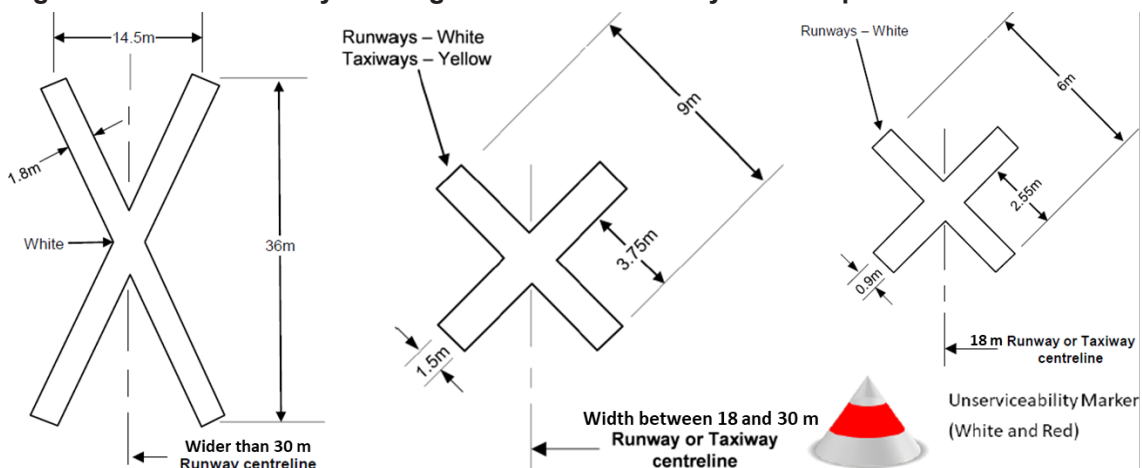
As defined by the Civil Aviation Safety Regulations Part 139 Manual of Standards (MOS) for Aerodromes, unserviceability markings are used for temporary and permanent closures of aerodrome surfaces. They consist of white or yellow crosses of various sizes. When used to mark a runway as temporarily unserviceable, the MOS requires:

- markings to be white
- markings to be placed at each end of the runway, or portion of a runway, that is declared unserviceable
- additional markings to be placed so that the maximum interval between markings does not exceed 300 metres.

The size of the markings for unserviceable runways was determined by the width of the runway (Figure 2):

- for runway widths greater than 30 m – a 36-metre-long by 14.5-metre-wide cross
- for runway widths from 18 m up to 30 m – a cross with 9-metre-long lines
- for runway widths less than or equal to 18 m – a cross with 6-metre-long lines.

**Figure 2: Unserviceability markings and unserviceability marker specifications**



To allow aircraft to taxi along a runway that has been closed with unserviceability markings, unserviceability markers are required to delineate the serviceable portion of the runway to be used as a taxiway. Additional temporary lighting is required for any night operations.

### Unserviceability markers

As defined by the MOS, unserviceability markers were to be a 50 cm tall white cone with a 25 cm wide horizontal red stripe (Figure 2). These markers had to be placed at the entrance to, and across, any part of the movement area of an aerodrome (including runways) that are not to be

used by aircraft. Additionally, at least three had to be displayed across the centreline of any portion of a taxiway, apron or holding bay that is unserviceable.

### ***Pre-flight planning***

The pilot used the AvPlan electronic flight bag (EFB) application on a tablet for pre-flight planning, including accessing weather information and NOTAMs. Weather information for the flight had been reviewed the previous day and multiple times on the day of the incident. Due to the expectation that diversions around weather would be necessary, Temora Aerodrome was identified as an appropriate additional stop for refuelling. When planning to stop in Temora, the pilot reported calling the fuel provider to confirm availability of Jet-A1 fuel in addition to checking weather and NOTAMs using AvPlan.

The pilot's NOTAM checking procedure involved using AvPlan to mark NOTAMs as 'read' when the pilot determined they were not relevant to their operations. They did this to reduce the cognitive load when referring to relevant NOTAMs, which were left 'unread', during further planning and flight. In this case, the pilot planned to land on runway 05 due to a light headwind. The NOTAM regarding closure of runway 18/36, and availability as a taxiway, was marked as read as it had no effect on their planned operation.

### ***In-flight decision making***

When in flight, the pilot listened to the AWIS system to retrieve the current weather conditions at Temora Aerodrome. The pilot reported that both the Temora AWIS and Williamtown ATIS<sup>4</sup> broadcast on the same frequency (134.45), which resulted in difficulties hearing the broadcast at cruise altitude. The pilot reported that the AWIS was broadcasting the wind as 090 at 5 knots.

Due to the drop in wind and lack of traffic on the Temora CTAF, the pilot decided to change plans and land on runway 18 to minimise taxiing after landing. At this time, the pilot did not review the NOTAMs issued for Temora Aerodrome.

## **Safety analysis**

### ***NOTAM information***

The NOTAM closing 18/36 was dismissed as part of the pilot's practice of marking irrelevant notices as 'read' in AvPlan during pre-flight planning. While this process enabled notices deemed relevant to be referenced more easily during flight, in the event of an emergency, change of plans, or misunderstanding of relevancy, this may result in critical information not being recalled or reviewed.

Had the pilot reviewed all NOTAMs for Temora Aerodrome when considering landing on runway 18 during flight, they would have been alerted to its closure. In this case, the pilot would have continued to land on runway 05 as planned.

### ***Evidence of closure***

As well as the active NOTAM at the time of the incident, Temora Aerodrome had a total of three unserviceability markings, crosses with 6-metre-long lines, along runway 18/36. The Civil Aviation Safety Regulations Part 139 Manual of Standards (MOS) required these markings to be 9 metre markings for a 30 m wide runway, and be placed no more than 300 m apart. This would mean that at least 5 markings were required for the 1,469-metre runway. As the length of runway being used as a taxiway exceeded 300 metres, temporary taxiway markings would also be required to separate unserviceability markings from the taxi route.

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<sup>4</sup> Automatic terminal information service (ATIS): The provision of current, routine information to arriving and departing aircraft by means of continuous and repetitive broadcasts during the hours when the unit responsible for the service is in operation.

At the time of the incident, the unserviceability markings, were not located in positions that were clearly visible when landing or taxiing on runway 18, and were not of the required size. These factors likely contributed to the pilot not seeing the unserviceability markers during landing or taxi.

Unserviceability markers (cones) located at the entrances to the works area, both on taxiways and on the runway, were placed in accordance with the requirements of the MOS. These markers are primarily designed to be visible from the ground and were identified upon touchdown.

Although the pilot predicted that the aircraft would be able to stop before reaching the cones, they were not aware why the cones were present or consider the possibility of other runway issues (such as holes) being present before the cones. Had the pilot conducted a go-around when encountering unexpected markings, they would have had the opportunity to re-check NOTAMs and identify the closure of the runway.

## Findings

ATSB investigation report findings focus on safety factors (that is, events and conditions that increase risk). Safety factors include 'contributing factors' and 'other factors that increased risk' (that is, factors that did not meet the definition of a contributing factor for this occurrence but were still considered important to include in the report for the purpose of increasing awareness and enhancing safety). In addition 'other findings' may be included to provide important information about topics other than safety factors.

These findings should not be read as apportioning blame or liability to any particular organisation or individual.

From the evidence available, the following findings are made with respect to the landing on closed runway involving a Cessna 510 Citation Mustang at Temora Aerodrome on 21 October 2021.

### **Contributing factors**

- During pre-flight planning, the pilot regarded information about a closed runway to be irrelevant and did not review the available information when the plan was changed during flight.
- The pilot did not see the unserviceability markings or markers that were on the runway prior to touchdown, leading to a landing on a closed runway.
- The pilot elected to continue the landing after seeing unserviceability markers on the closed runway.
- The runway was not marked in accordance with the Part 139 Manual of Standards to communicate that the runway was closed for take-off and landing.

## Safety actions

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. All of the directly involved parties are invited to provide submissions to this draft report. As part of that process, each organisation is asked to communicate what safety actions, if any, they have carried out to reduce the risk associated with this type of occurrences in the future. The ATSB has so far been advised of the following proactive safety action in response to this occurrence.

### **Safety action addressing in-flight decision making**

The pilot has advised that they will now review all NOTAMs for an aviation facility when changing plans during flight.

### **Safety action by Temora Aerodrome operator**

Additional 9 metre markings have been purchased for use on both runways.



## Sources and submissions

### **Sources of information**

The sources of information during the investigation included the:

- Civil Aviation Safety Regulations Part 139 (Aerodromes) Manual of Standards 2019 (as amended 13 August 2020)

### **Submissions**

Under section 26 of the *Transport Safety Investigation Act 2003*, the ATSB may provide a draft report, on a confidential basis, to any person whom the ATSB considers appropriate. That section allows a person receiving a draft report to make submissions to the ATSB about the draft report.

A draft of this report was provided to the following directly involved parties:

- Temora Aerodrome operator
- the Civil Aviation Safety Authority
- the pilot

A submission was received from the pilot.

The submission was reviewed and, where considered appropriate, the text of the report was amended accordingly.

# General details

## Occurrence details

Date and time:	21 October 2021 – 1853 AEDT	
Occurrence class:	Incident	
Occurrence categories:	Land wrong runway	
Location:	Temora Aerodrome	
	Latitude: 34° 25.283' S	Longitude: 147° 30.700' E

## Aircraft details

Manufacturer and model:	CESSNA AIRCRAFT COMPANY 510
Registration:	VH-MSU
Operator:	AVIA AVIATION PTY LTD
Serial number:	510-0300
Type of operation:	Travel - (Private)
Activity:	General aviation
Departure:	Sunshine Coast Aerodrome, Queensland
Destination:	Temora Aerodrome, New South Wales
Persons on board:	Crew - 1 Passengers 4
Injuries:	Nil
Aircraft damage:	Nil