

February 2010

## Executive Summary

# Toodyay Fire Incident

near Poles T303/42 and T303/43

### Incident Location:

500 metres west of River Road and  
Folewood Road, Toodyay

### Incident Date:

29 December 2009

PREPARED BY

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## **EXECUTIVE SUMMARY**

On Tuesday 29 December 2009 a fire commenced in the vicinity of a Western Power 12.7 kV powerline on a private farm near the corner of River Road and Folewood Road, approximately 5 kilometres west south west of Toodyay. This fire caused damage to homes and infrastructure.

Investigations by FESA on the 29 December 2009 concluded that the fire was accidental and attention was focussed on the electrical infrastructure as the source of ignition for the fire. The area of origin was identified by FESA as the area surrounding poles T303/42 and T303/43 with no precise point of ignition established.

Western Power examined possible causes of electrical discharge to determine whether Western Power's electrical infrastructure caused or contributed to the fire.

Western Power also engaged several experts<sup>1</sup> to undertake an investigation and analysis of the probable causes of failure of poles T303/42 and T303/43, condition of the poles and determine the origin and cause of the fire.

Western Power's full investigation report was submitted to EnergySafety on Friday 22 January 2010, and is available for download from the Western Power website at [www.westernpower.com.au](http://www.westernpower.com.au).

### **Key conclusion**

The source of ignition of the fire is unknown. However, after examining the possible causes of electrical discharge on the section of line surrounding poles T303/42 and T303/43, it is most unlikely that an electrical discharge from this section of line (if there was any, which is unlikely) could have been caused by agents or factors within the control of Western Power on the 29 December 2009.

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<sup>1</sup> Western Power commissioned the Forest Products Commission (timber expert), GRS Timber Consulting (timber expert) and Fire Investigation, Risk & Enquiry Services Pty Ltd (fire point of origin expert) for reports.

## Summary of events

Meteorological records in the area for the day indicated a maximum temperature of 45.4° C and wind from the north northwest with an average maximum speed of 44 km/hr. A catastrophic fire rating was issued for the day. This is the highest level of fire rating issued and was the first time this rating had been used extensively in the state.

The smoke from a fire was observed at approximately 12:53 pm in the vicinity of poles T303/42 and T303/43, and reported to 000.

The protection device upstream of pole T303/42, recloser T303/1A, located near the town of Toodyay detected four consecutive fault currents and locked out at 12:54 pm, de-energising the line downstream of recloser T303/1A (which included the section of the line between poles between poles T303/41 and T303/44) .

The successful protection operation was confirmed shortly after when the first notification of loss of supply was received from a residence downstream of recloser T303/1A at 1:02 pm.

After 1:03 pm a witness confirmed that pole T303/42 was standing with the bottom one metre section of the pole on fire.

After 2:00 pm a witness reported that the wires suspended by poles T303/42 and T303/43 were at approximately windscreen height, and that pole T303/42 was either lying on the ground or very close to the ground but the wires still had tension, which indicates that the wires had not broken.

After 5:00 pm on 29 December 2009, FESA, Police Arson Squad and Western Power representatives inspected the section of line in the area of the reported origin of the fire and found that both poles T303/42 and T303/43 had burnt and collapsed, and were still burning on the ground. FESA had assumed responsibility for securing the presumed location of the commencement of the fire including poles T303/42 and T303/43.

## Key Findings

Based on the information gathered over the course of investigations by FESA, EnergySafety and Western Power, a number of key findings can be made regarding the Toodyay fire on 29 December 2009. These are summarised below.

- The origin of the fire was approximately 500 metres west of the corner of River Road and Folewood Road, in the vicinity of poles T303/42 and T303/43.
- The fire commenced prior to 12:53 pm.
- Power to the line downstream of recloser T303/1A, which includes the section of line between poles T303/41 and T303/44, was de-energised at 12:54 pm.
- Pole T303/42 and T303/43 were standing after the fire had passed.
- The phase conductor and earth wire were attached to poles T303/42 and T303/43 when each of them collapsed and fell to ground after 1:03 pm. Further, when the collapse occurred, the line was de-energised.
- The failure of both poles T303/42 and T303/43 was due to fire ingress at ground level. The fire burn through the base of each pole which caused them to collapse some time after the fire had passed. There was no mechanical failure of the poles.
- Poles T303/42 and T303/43 did not suffer any form of pole top fire.
- There is an arcing mark on the phase conductor and a corresponding arcing mark on the earth wire directly below that of the phase conductor, approximately fourteen metres east from pole T303/43. A further arcing mark was also identified on the phase conductor approximately 9 metres east from pole T303/43. The age and cause of the arcing marks are not known, and may be the subject of further analysis following review of the metallurgical report.
- There is no evidence that electrical arcing due to equipment operation or failure between poles T303/41 and T303/44 occurred or caused the fire.
- There is no evidence that animals or birds bridged the phase conductor and earth wire between poles T303/42 and T303/43 and created an electrical discharge.
- There are no trees between poles T303/42 and T303/43 or evidence of airborne tree branches or limbs that could have bridged across the phase conductor and earth wire between poles T303/42 and T303/43.

- In the absence of arcing marks close to the mid-point of the bay of poles T303/42 and T303/43 and recorded fault events from this section of the line, there is no evidence that the phase conductor and earth wire clashed.
- A live conductor did not make contact with the ground between poles T303/42 and T303/43 (because the power line was de-energised before the poles collapsed bringing the wires to the ground).
- There is no evidence of lightning on 29 December 2009 between 1000 hours and 1300 hours.