

RECLASSIFICATION DUE TO LIGHTNING



PRESENTED BY Henry Gorniak

ABNORMAL CONDITIONS

- Under normal conditions the simultaneous trip of both circuits of a double circuit transmission line would be considered a non credible contingency event.
- During lightning storms AEMO may determine that the occurrence of that non-credible contingency event is reasonably possible and AEMO may reclassify that event to be a credible contingency event. (NER 4.2.3 A)

DEFINITIONS

- **Exceptional Event:** Simultaneous trip of a double circuit transmission line during a lightning storm caused by an event that is far beyond what is usual in magnitude or degree for what could be reasonably expected to occur during a lightning storm.
- **Lightning trip:** Simultaneous trip of a double circuit transmission line during a lightning storm which cannot be attributed to a cause other than lightning and is not an Exceptional Event.
- **LTTW:** Lightning Trip Time Window which is a rolling time period representing the previous 5 years.
- **Vulnerable:** Vulnerable transmission lines are double circuit transmission lines which fall into the categories for Probable or Proven

Possible

- All events are deemed to be possible, however, if there is no evidence of the double circuit transmission line simultaneously tripping due to lightning during the LTTW **and** the lines are shielded by an Optic Fibre Ground Wire (OPGW) or Overhead Earth Wire (OHEW), then during lightning storms no action will be taken to reclassify the trip of the double circuit transmission line as a credible contingency event.

Probable

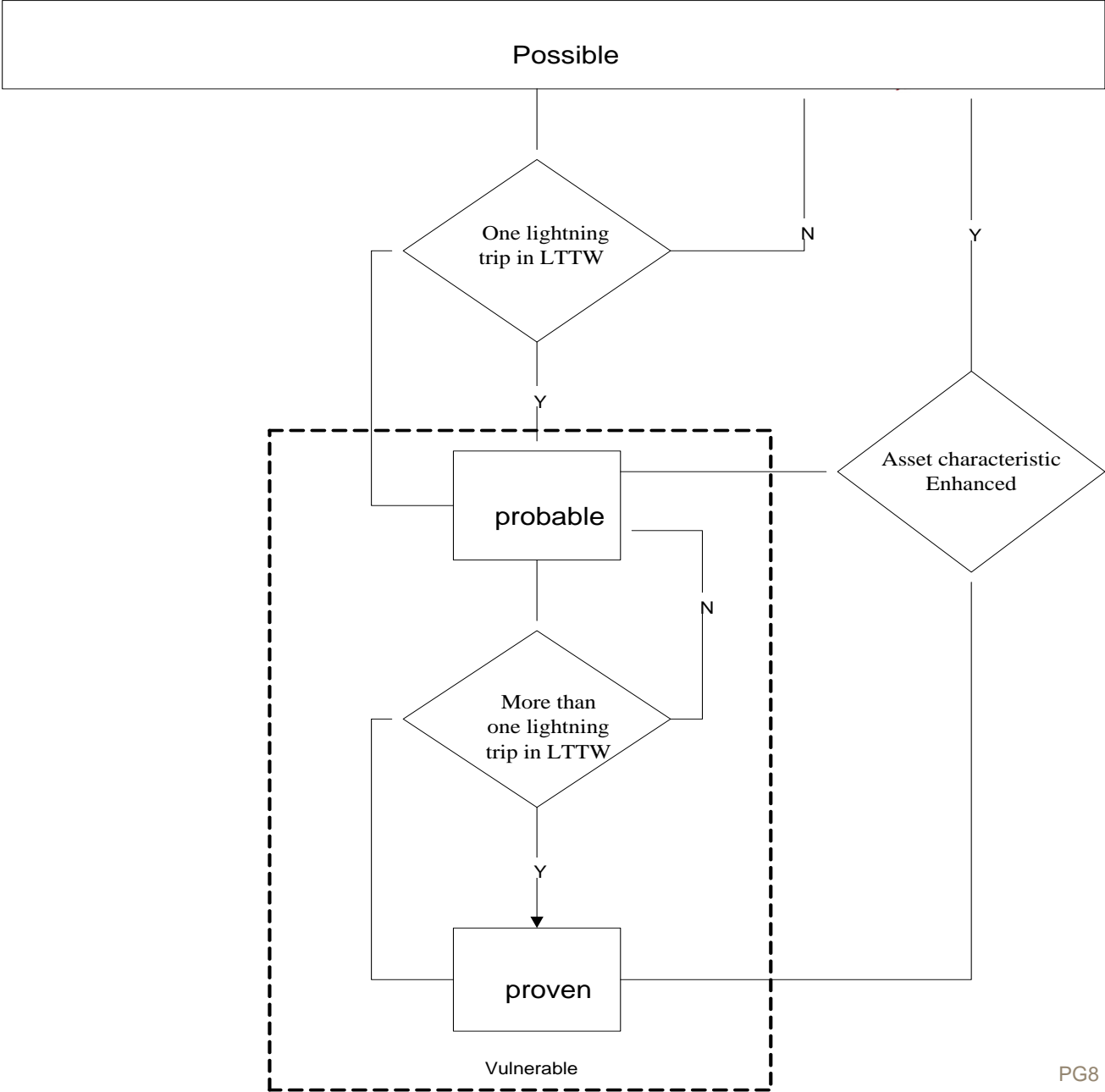
- A double circuit transmission line that has experienced a lightning trip during the LTTW is categorized as probable.

- **Proven**
- Lines which are not shielded by an Optic Fibre Ground Wire (OPGW) or Overhead Earth Wire (OHEW).
- Lines where the TNSP has advised AEMO of a deterioration in relevant characteristics to the extent that the line should be categorized as Proven.
- There have been **two** lightning trips during the LTTW.

Vulnerable transmission Lines

- A double circuit transmission line in this category is eligible to be reclassified as a credible contingency event during a lightning storm if a cloud to ground lightning strike is detected within a specified distance of the vulnerable lines.

CATEGORY



- **lightning attachment zone (LAZ)** : 20 km either side of the vulnerable double circuit transmission line, and
- **lightning warning zone (LWZ)**: 20 km either side of the LAZ

LIGHTNING DETECTION ZONES

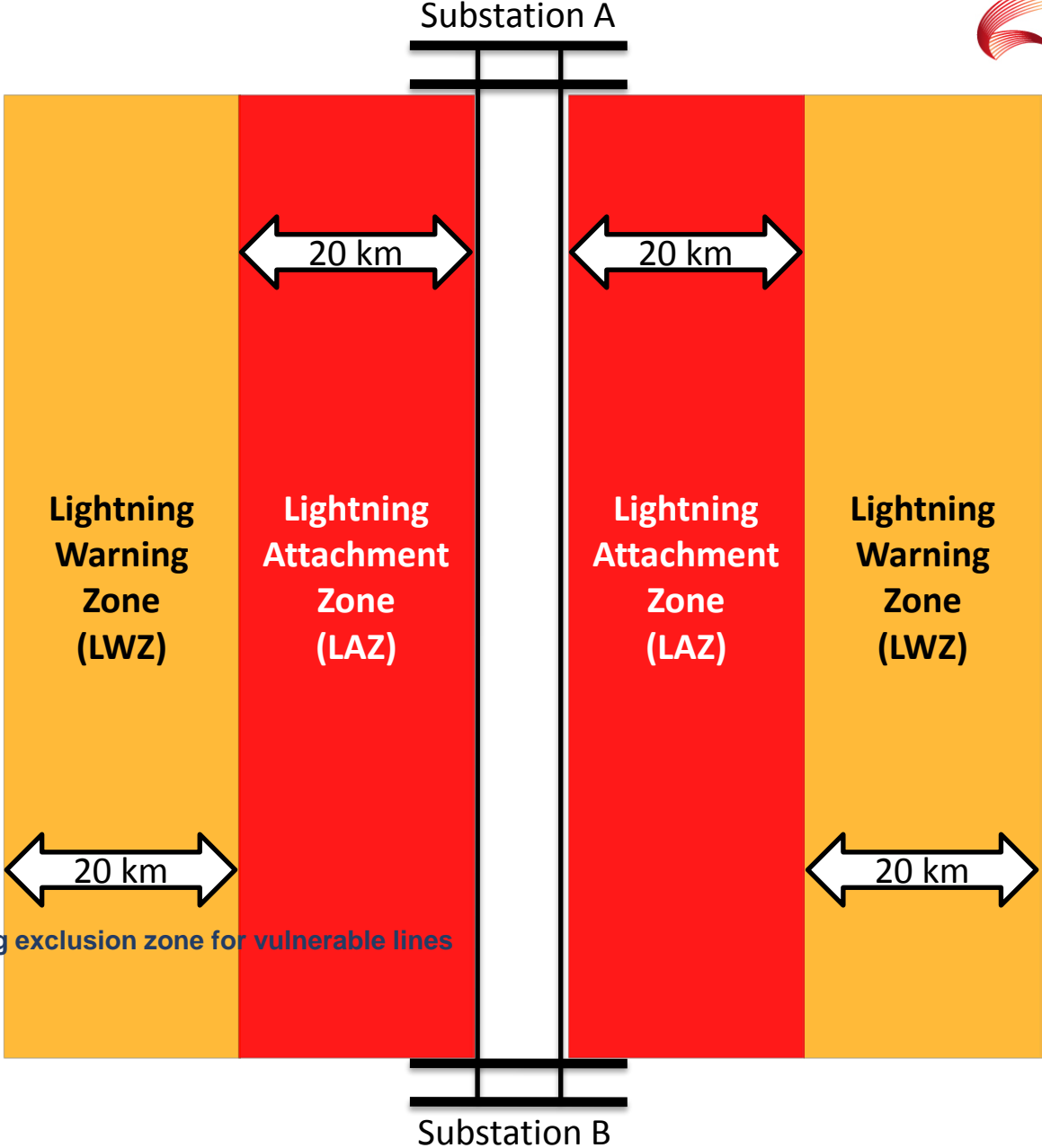
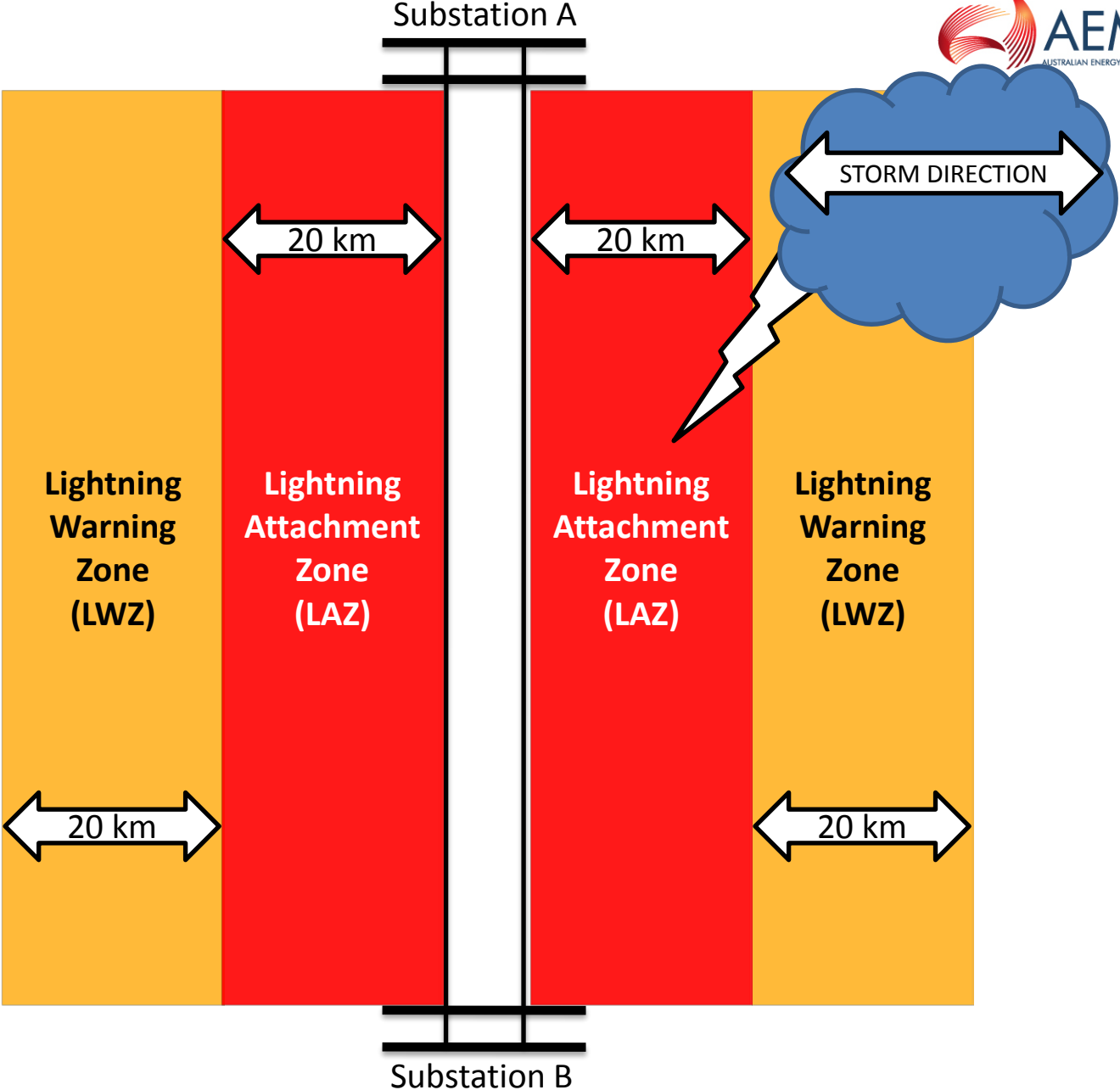
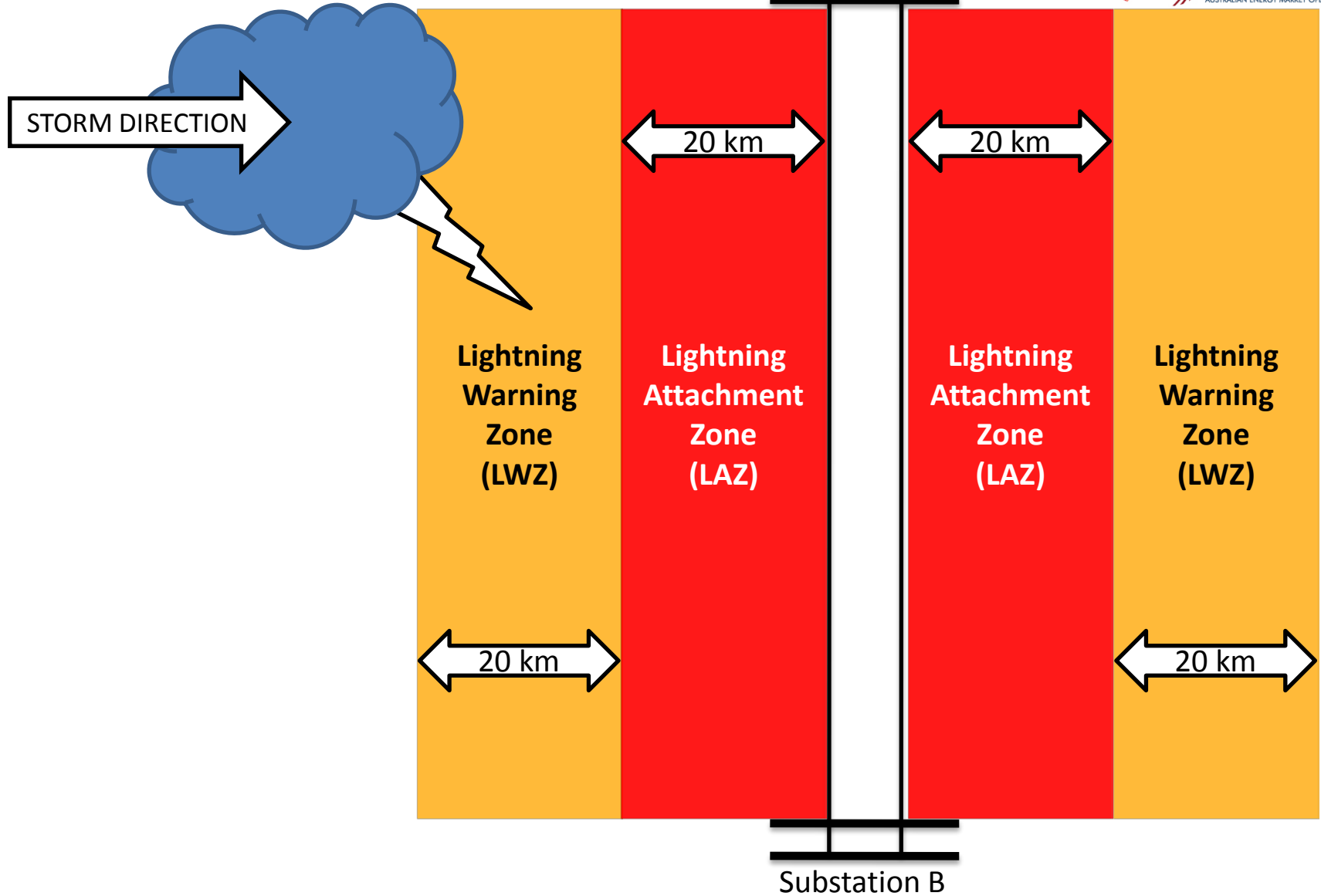


Figure 2 Lightning exclusion zone for vulnerable lines

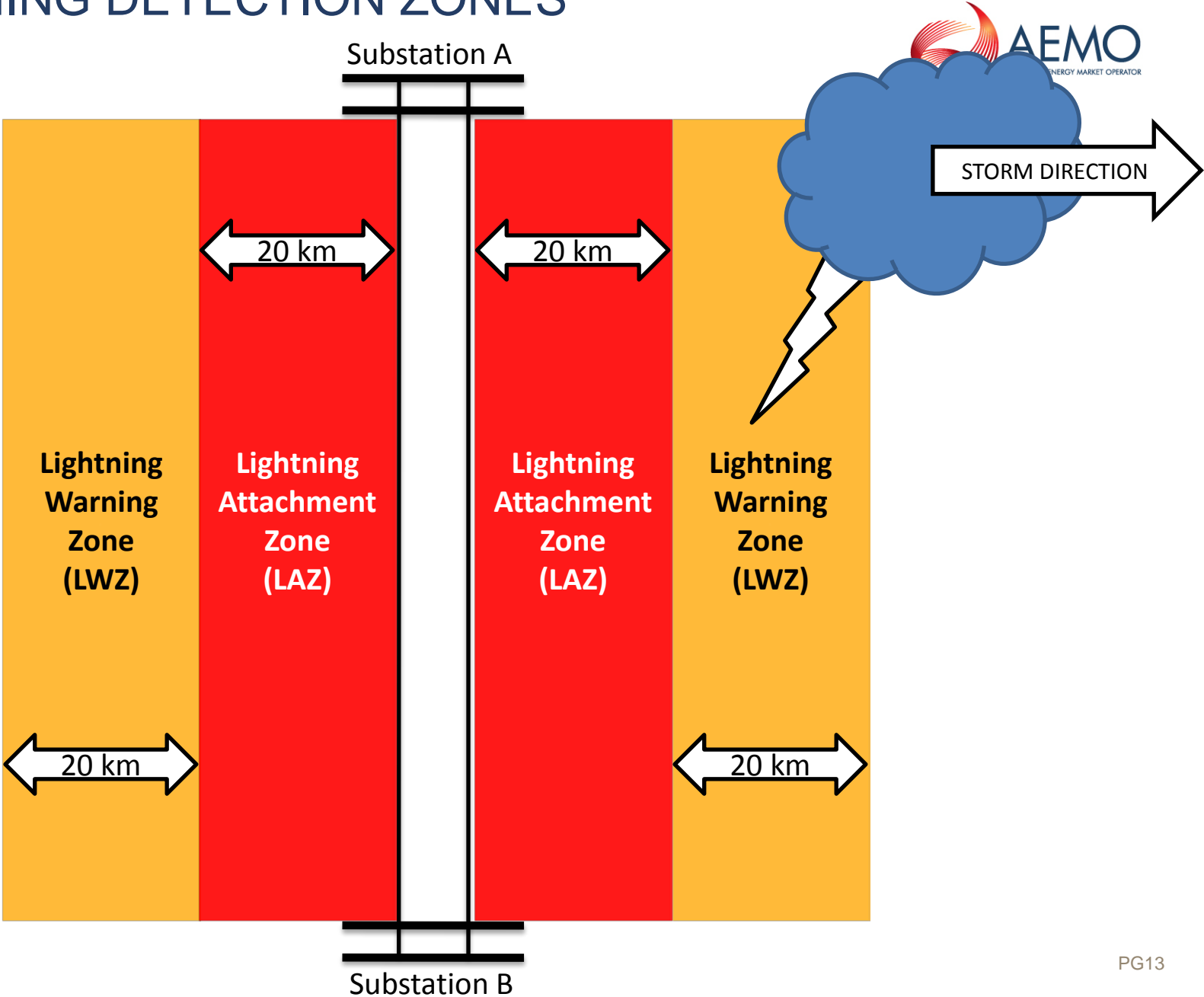
LIGHTNING DETECTION ZONES



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- AEMO will review each reclassification event triggered by lightning to ensure that the criteria is appropriate and effective in its application to the reclassification.
- In accordance with NER 4.2.3 B (b) every two years after the date of establishment of the Lightning Trip reclassification criteria, AEMO must undertake a review of that criterion.

LIGHTNING DAMAGE TO SUBSTATIONS



BACKFLASHOVER



SHIELDING FAILURE



