

Power system model validation using real-time events

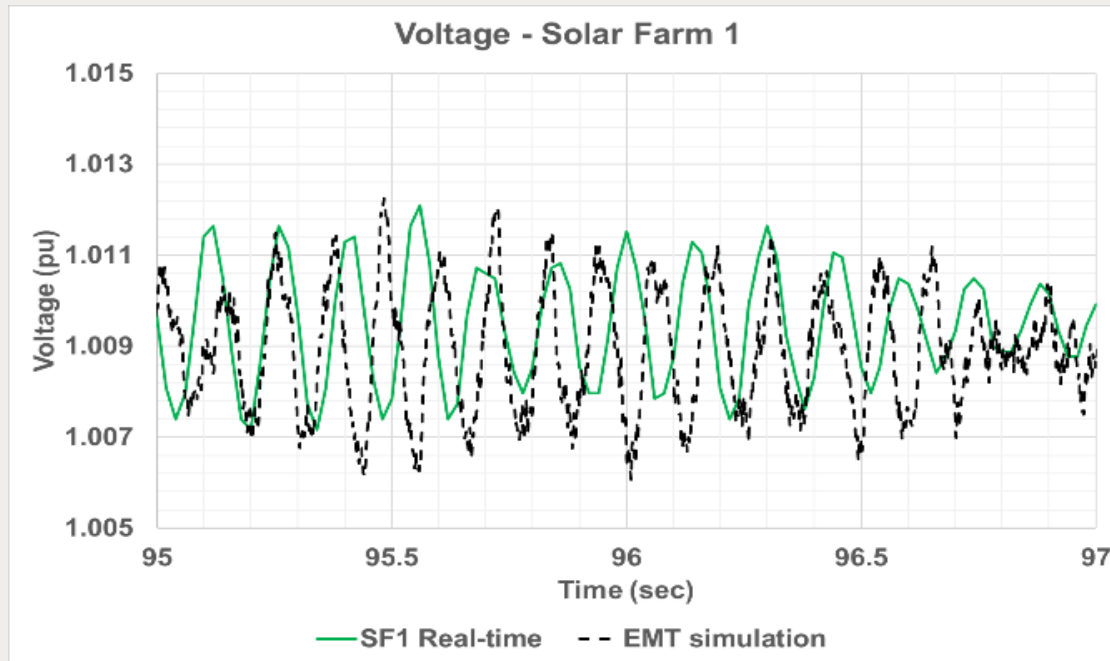
SC4

PS 3 / Q 14 What are the worldwide experiences in situations where the overall power system model failed to predict an actual system event or ongoing occurrences of abnormal responses, and were the causes could be deterministically identified and rectified?

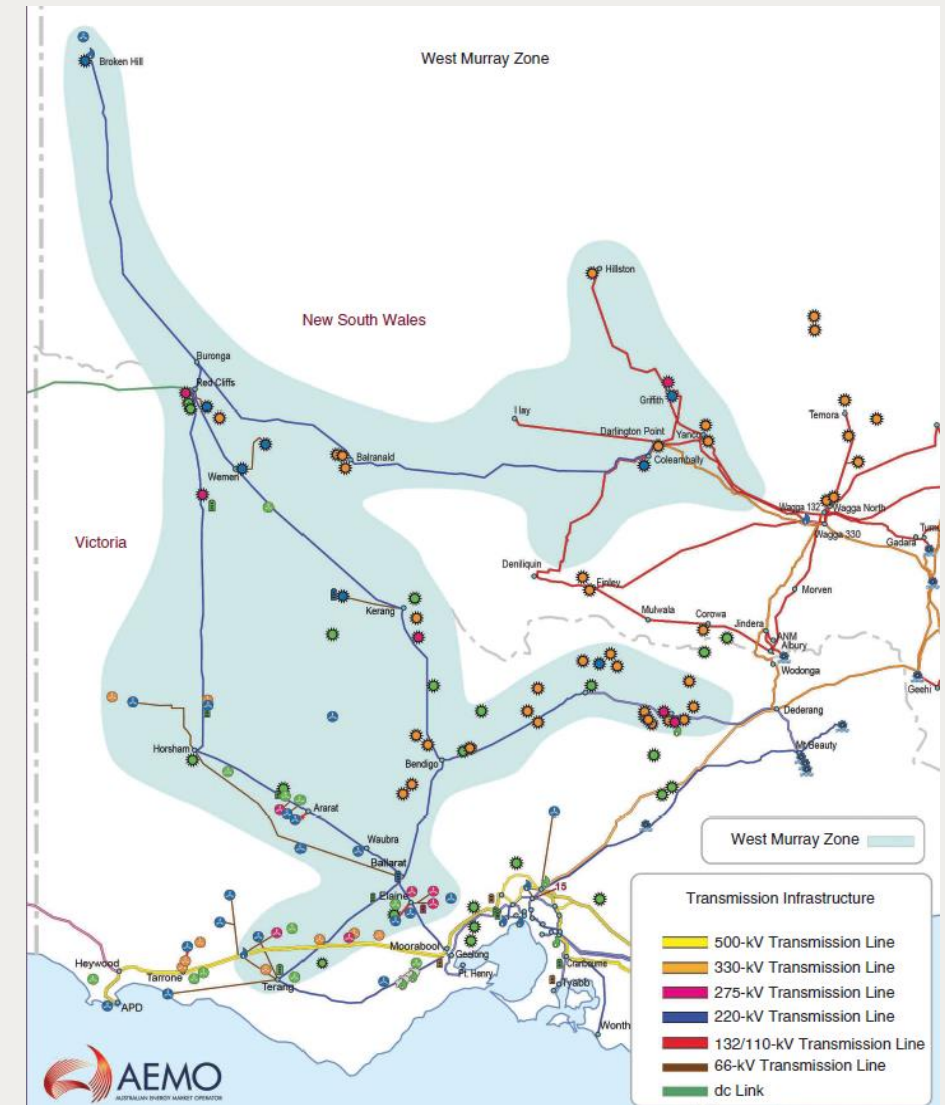
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West Murray Area : 7 Hz oscillations

- ~7 Hz voltage oscillations following a disturbance
- Validation with real system test



Group Discussion Meeting



West Murray Area : 17 Hz oscillations

Model	Method adopted	Outcome
Full wide-area NEM Model	Active power ramp at few plants around the network, individually and collectively	No voltage oscillations in the range of 17-19Hz could be observed.
	Trip of 220/66kV transformers to reduce SCR level	
Reduced with network	SCR ramp down at both RCTS and KGTS ends, while applying simultaneous active power ramp to few plants around the network	No voltage oscillations in the range of 17-19Hz could be observed.
	SCR and X/R ratio ramp down (one at a time) at both ends	
	Previous step repeated with unbalanced voltages at both ends (RCTS and KGTS)	
	17Hz voltage oscillations injection at RCTS	No amplification in the oscillations was observed
	Measurement of the impedance seen by a SF for frequencies in the range of 15-19Hz, while varying active power output of few plants	The results show no considerable change in the impedance seen by the SF under investigation

West Murray Area : 17 Hz oscillations

Model	Method adopted	Outcome
SMIB	SCR reduction (both as a ramp and a step) to few SFs	The results demonstrate 17-20Hz oscillations
	SCR step-down for a SF at various active power outputs	The results depict 17-22Hz oscillation, with lower active power output indicating lower frequency of oscillation at the same X/R condition
	Injection of 17Hz voltage oscillations	No oscillations amplification was observed by any of the SFs.

