

# RECOMMENDATIONS ARISING FROM POWER SYSTEM OPERATING INCIDENT REPORTS - PROGRESS OF IMPLEMENTATION BY SEPTEMBER 2012

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FINAL

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## Version Release History

VERSION	DATE	BY	CHANGES
1.0	1/05/2012	ESOPP	Initial version
2.0	12/06/2012	Operations Planning	Updated till end of May 2012.
3.0	30/07/2012	Operational Adequacy	Updated till end of June 2012.
4.0	09/10/2012	Operational Adequacy	Updated till end of September 2012.

## 1 Purpose

AEMO publishes reports on power system incidents ranging from a brief notice a few minutes after the event to a major report up to 80 to 120 business days later. In early 2011, AEMO sought feedback from stakeholders on the information provided in, and timeliness of, these reports to assist in identifying improvements.

One of the feedback received was on tracking progress on the implementation of recommendations arising from power system operating incident investigations (PSOIs). In response to this feedback AEMO undertook to publish a list of all current recommendations and proposed time for implementation on AEMO's website. This list will help ensure that work streams progress in a timely manner and reduce the probability of a recommended change not being completed. AEMO undertook to update this list quarterly.

Documents on feedback sought on reporting of power system incidents are available at:

<http://www.aemo.com.au/en/Electricity/Market-and-Power-Systems/NEM-Reports/NEM-Feedback-Sought-on-Reporting-of-Power-System-Incidents>

AEMO power system operating incident reports from 2010 are available at:

<http://www.aemo.com.au/Electricity/Resources/Reports-and-Documents/Power-System-Operating-Incident-Reports>

## 2 General

The list of recommendations covers PSOIs that occurred after 1 July 2009.

The section 3 of this report lists the recommendations and their status as of end of September 2012.

Each incident in the list contains eight data fields as shown below:

1. Identification number of the PSOI.
2. Date the PSOI occurred.
3. Region in which the PSOI occurred.
4. Summary of the incident and a link to the report.
5. Recommendation(s) arising from the PSOI.
6. Parties responsible for implementing the recommendation.
7. The date by which the recommendation must be completed.
8. Status of the recommendation:

Completed recommendations are marked in GREEN.

Recommendations that are progressing (due dates have not expired yet) are marked in BLUE.

Overdue recommendations are marked in RED.

**Note:** The convention used to refer to a recommendation is: PSOI ID.Recommendation Number (For example the reference number for Recommendation 3 of PSOI 22 is 22.3.)

### 3 List of recommendations – progress of implementation by September 2012

ID	Date of Power System Incident	Region	Summary/ Link to report	Recommendations	Responsible parties	Due date	Status
1	02/07/2009	NSW	Multiple generator disconnection and Under frequency load shedding event - Volume 1  (This report has been archived)	1. TransGrid to provide AEMO with a final statement of the level of risk remaining on the system.	TransGrid	30/11/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. TransGrid to advise AEMO when the DGA testing and replacement program of CTs of concern has been completed.	TransGrid	31/10/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				3. AEMO to follow up on the prevalence of similar CTs in the rest of the power system and assess the risk posed by these CTs to the system	AEMO	31/12/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				4. TransGrid to inform AEMO of the planned date for installation of the modified Unit 4 intertripping arrangements and to advise AEMO when the modifications have been completed.	TransGrid	31/10/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				5. Macquarie Generation to inform AEMO of the outcome of its further investigations into the trip of Bayswater Unit 2 on overspeed protection, the adequacy of the control system to capture necessary data and the adequacy of the FSISS power supply.	Macquarie Generation	31/01/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				6. Delta Electricity to inform AEMO of the outcome of its investigation into the trip of Mount Piper Unit 2.	Delta Electricity	30/11/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				7. Stanwell Corporation to inform AEMO of the outcome of its investigation into the trip of the Gladstone Unit.	Stanwell	31/12/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed

			<input type="radio"/> Overdue
8. AEMO to investigate further whether there are any systematic risks related to the current over-excitation settings for Gladstone generating units.	AEMO	31/01/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
9. TRUenergy to inform AEMO of the outcome of its investigation into the trip of Yallourn West Unit 3.	TRUenergy	20/12/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
10. AEMO to investigate suitable options to address the risk of power system frequency not recovering within the required time to the normal operation frequency band following a multiple contingency event where the frequency does not fall below 49.0Hz.	AEMO	30/06/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
11. Ergon Energy will complete the investigation of the unexpected interruption of 2MW load.	Ergon Energy	04/12/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
12. Ergon Energy will implement the time delay UFLS blocks with the correct interlock function as specified in the design.	Ergon Energy	03/09/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
13. Energy Australia will implement the UFLS load block yet to be implemented as a 30 second time delay load block.	Energy Australia	30/11/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
14. ElectraNet will inform AEMO of the outcome of their investigation into the UFLS protection at Murray Bridge Hahndorf Pumping Stations 1, 2 & 3.	ElectraNet	30/11/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
15. ETSA Utilities will implement the UFLS setting of 49Hz at the remaining site.	ETSA Utilities	30/11/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue

				16. Transend will investigate the delay in operation of the second CB at Nyrstar and inform the outcome to AEMO.	Transend	24/12/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				17. AEMO to investigate the appropriateness of the use of the Constraint Automation application under similar conditions	AEMO	31/12/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				18. AEMO to implement methods to improve the flow of information immediately following a power system event.	AEMO	30/11/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				19. AEMO to undertake an assessment of the likely impact of the event occurring for a range of system conditions.	AEMO	31/03/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				20. Transend to investigate the reason for the presence of the negative phase sequence current on the AC system and report back to AEMO.	Transend	31/12/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
2	02/07/2009	NSW	Multiple generator disconnection and Under frequency load shedding event - Volume 2  (This report has been archived)	1. AEMO should follow up on the appropriateness of the high speed data measuring facilities of:  a) Hydro Electric Corporation in relation to Bastyan, Mackintosh, Meadowbank, Poatina 110 kV, Reece 1, Reece 2, Tungatinah 1 and Tungatinah 5.	AEMO	30/04/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. AEMO should follow up as to whether the observed fast raise service response of the following is indicative of any underlying issues:  a) Tarong Energy in relation to Tarong unit 1; and b) State Electricity Commission of Victoria in relation to Portland Smelter Potline 1.	AEMO	30/04/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue

				<p>3. AEMO should follow up as to whether the observed slow raise service response of the following is indicative of any underlying issues:</p> <ul style="list-style-type: none"> <li>a) Tarong Energy in relation to Tarong units 1 and 4;</li> <li>b) Macquarie Generation in relation to Liddell units 2 and 4;</li> <li>c) TRUenergy in relation to Yallourn W unit 1; and</li> <li>d) State Electricity Commission of Victoria in relation to Portland Smelter Potline 1 and Point Henry Potline 2.</li> </ul>	AEMO	30/04/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				<p>4. AEMO should follow up as to whether the observed delayed raise service response of the following is indicative of any underlying issues:</p> <ul style="list-style-type: none"> <li>a) Stanwell Corporation in relation to Mackay GT;</li> <li>b) Tarong Energy in relation to Tarong unit 1 and Tarong North;</li> <li>c) TRUenergy in relation to Yallourn W units 1 and 4; and</li> <li>d) State Electricity Commission of Victoria in relation to Portland Smelter Potline 1, and Point Henry Potlines 2 and 3.</li> </ul>	AEMO	30/04/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
3	28/07/2009	QLD	<p>Trip of Braemar Units 1 and 2  (This report has been archived)</p>	<p>1. Babcock &amp; Brown Power is currently investigating whether any improvements can be made to existing installations and routine inspection procedures of the gas yard to ensure ongoing reliability.</p>	Babcock and Brown Power	31/03/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				<p>2. It is recommended that AEMO Power System Operations liaise with Babcock &amp; Brown Power and investigate whether the loss of Braemar units 1 and 2 is considered a credible contingency event under the established Power System Security Guidelines<sup>1</sup> in light of the outcomes of the investigation of this power system incident included in this report, and having regard to</p>	AEMO and Babcock and Brown Power	04/12/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue



				other relevant information.			
4	26/08/2009	SA	Insecure Power System during outage of South East SVCs  (This report has been archived)	1. ElectraNet will review its maintenance procedures and secondary system diagrams of South East substation to correctly indicate how to isolate the SVC "Cooling System Failed" protection.	ElectraNet	Initial Completion Date: 31/03/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
						Extended Completion Date: 30/11/2012	
				2. AEMO will implement suitable changes to the Constraint Automation application to address deficiencies identified in this report.	AEMO	31/03/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				3. AEMO will review the process for adding and updating Constraint Automation modelling in EMS to reduce instances where the Constraint Automation application would be ineffective.	AEMO	30/06/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
			4. AEMO will review the effectiveness of the six-monthly Constraint Automation modelling review process with regard to identifying issues similar to those described in this report.	AEMO	30/06/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue	
5	02/09/2009	VIC	Insecure Power System Operation in Victoria  (This report has been archived)	1. AEMO has requested SP AusNet to increase the instrumentation ranging on the SMTS H1 and H2 330 kV transformers.	SP AusNet	31/12/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. AEMO will complete a review of other transmission equipment instrumentation ranging in Victoria.	AEMO	30/06/2009	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
6	04/10/2009	QLD	Strathmore to Ross 879 & 880 275 kV lines declared credible	1. AEMO will ensure that on-line staff are regularly refreshed regarding the steps involved in the process of issuing directions to maintain power system security.	AEMO	No timeline provided	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue

			(This report has been archived)	2. AEMO will review its process for updating the network model and displays in the EMS system in light of the outcomes of this investigation	AEMO	31/03/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
7	06/10/2009	VIC	Insecure Power System Operation in Victoria (This report has been archived)	1. AEMO's procedures for assessing similar outages at HWPS will be reviewed and updated to specifically consider bus tie capability, and the use of maximum generation output in addition to the generation dispatch predicted by pre-dispatch.	AEMO	31/03/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. AEMO will review control room processes to assess whether situational awareness with regards to real time contingency violations can be improved for day to day operations.	AEMO	31/03/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
8	09/10/2009	QLD	Braemar Voltage exceeding satisfactory limit. (This report has been archived)	CS Energy will implement a modification to the Kogan Creek Power Station control systems to initiate a discrepancy alarm whenever the generator transformer tap changer controller mode is different to the indication at the power station control room so that the Kogan Creek operations staff will be able to promptly investigate the discrepancy.	CS Energy	30/04/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
9	13/10/2009	QLD	Trip of Townsville South 132 kV busbar (This report has been archived)	Powerlink will provide AEMO an update on its investigation with the circuit breaker manufacturer on the fault in the circuit breaker in question.	Powerlink	31/05/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
10	19/10/2009	TAS	Trevallyn Power Station trip. (This report has been archived)	1. The procedure attached to the job ticket to be re-written/tested/reviewed and approved.	Hydro Tasmania	No timeline provided	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. The job hazard analysis (JHA) to be updated and to clearly warn of the potential for tripping the station.	Hydro Tasmania	No timeline provided	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue

				3. The components of the system to be re-labelled.	Hydro Tasmania	30/01/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
11	05/11/2009	QLD	Trip of 8811 Calvale – Tarong 275 kV line, Tarong Unit 2 and Columboola 132 kV CB 73562  (This report has been archived)	1. Tarong Energy will investigate the corrective action required to minimise the susceptibility of the protection systems of No.1 and 2 generating units to externally induced noise.	Tarong Energy	31/12/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. QGC Sales Pty.Ltd will investigate the unexpected protection operation at the Condamine power station during this event and identify any required corrective actions to minimise similar events in future. QGC to inform AEMO the outcome of the investigation.	QGC Sales Pty Ltd.	31/08/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
12	13/11/2009	QLD	Trip of multiple transmission lines in the vicinity of Braemar 275 kV substation  (This report has been archived)	ERM Power will continue to investigate the reasons for operation of the Braemar 2 Power Station unit protection systems which in-turn intertripped the Braemar - Braemar 2 Power Station (8840 & 8841) 275 kV transmission lines.	ERM Power	31/05/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
13	22/11/2009 and 23/11/2009	SA	Trip of 132 kV East Busbar at Playford Power Station switchyard  (This report has been archived)	AEMO will review its process for updating constraint equations to reflect power system augmentations	AEMO	31/05/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
14	26/11/2009	VIC	Trip of No.4 Fishermen's Bend 220 kV Busbar  (This report has been archived)	SP AusNet will continue to monitor the performance of the busbar protection systems at FBTS and report its observations to AEMO.	SP AusNet	31/03/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
15	27/11/2009	SA	Power System Security Issues in South Australia  (This report has been	1. AEMO is to review its outage assessment procedures in light of the observations from this power system incident.	AEMO	30/04/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue

			archived)	2. AEMO is to review its guidelines on the application of constraint equations during concurrent outages and improve the guidelines so as to identify situations where new constraint sets for concurrent outages will be required.	AEMO	31/05/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				3. AEMO is to audit the contingency definitions used in RTCA to ensure all control schemes employed in the transmission networks are modelled in RTCA. This action has already been implemented for the Murraylink runback scheme.	AEMO	30/06/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				4. AEMO will improve the 6-monthly audit process for the Constraint Automation database to ensure all relevant power system elements and their associated parameters are included in the database.	AEMO	30/06/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
16	27/03/2010	NSW	Trip of Upper Tumut to Canberra and Upper Tumut to Lower Tumut 330 kV lines	1. TransGrid to replace the DEF relay associated with the No.2 protection system of Line 64 at the Upper Tumut 330 kV substation and advise AEMO of the completion of this task.	TransGrid	31/03/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. AEMO will complete studies to determine if the clearing times of the high impedance faults on Line 01 are acceptable.	AEMO	31/12/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
17	06/04/2010	VIC	Trip of No.1 and No.3 Busbars at 500 kV Loy Yang Power Station Switchyard	1. SP AusNet will inform AEMO the progress of follow up action 1 (refer section 4 in Incident report)	SP AusNet	31/08/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. SP AusNet will inform AEMO the progress of follow up action 3 (refer section 4 in Incident report)	SP AusNet	31/12/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
18	29/04/2010	TAS	Farrell A 220 kV bus trip	1. Transend should review its procedures to ensure that the Farrell Contingency Arming	Transend	31/12/2010	<input checked="" type="radio"/> Complete

				Scheme is enabled only for the duration of the appropriate planned outage.			<input type="radio"/> To be completed <input type="radio"/> Overdue
				2. Transend should make suitable changes to the Farrell Contingency Arming Scheme to enhance historical data recording.	Transend	31/12/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				3. Transend should investigate the reasons for the lack of high speed data from Farrell substation and report to AEMO on its findings and any remedial measures.	Transend	31/12/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				4. Transend should investigate the reasons for the misalignment of high speed data from the Georgetown data recorder for the Georgetown-Sheffield No. 1 220kV transmission line and report to AEMO on its findings and any remedial measures	Transend	31/12/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
19	April & May 2010	SA	Northern Power Station Stabiliser Outage	1. AEMO in consultation with ElectraNet will investigate and confirm the validity of the current operating instruction used at times when there is a reduced number of PSSs in service at Northern power station.	AEMO	31/12/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. AEMO in consultation with ElectraNet and the relevant power stations in South Australia will investigate the feasibility of receiving the ON/OFF status of PSSs of generating units via the SCADA system.	AEMO	31/12/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
20	05/05/2010	QLD	Collinsville units 1, 2 and 3 trip	CS Energy will forward a copy of its engineering review report and proposed actions to enhance the reliability of the UPS supply at Collinsville power station to AEMO.	CS Energy	31/10/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
21	12/05/2010	SA	Trip of the Snuggery – Blanche and Snuggery – South East / Mayurra 132 kV Lines	ElectraNet will advise AEMO once the design changes on the management/CFB relay have been completed.	ElectraNet	No timeline provided	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue

22	01/06/2010	NSW	Trip of Tamworth No.3 330 kV busbar section	TransGrid to inform AEMO once the checking of CTs that have been maintained over the past 6 months has been completed.	TransGrid	No timeline provided	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
23	10/06/2010	QLD	Trip of multiple transmission lines in the vicinity of the 275 kV Braemar substation	1. Powerlink will advise AEMO of the outcomes of its investigation on suitable measures to avoid high voltage conditions on the Braemar-Tarong 275 kV 8814 or 8815 transmission lines during single pole auto-reclose.	Powerlink	31/12/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. AEMO will modify its Power System Security Guidelines to ensure that following a non-credible contingency event, information is sourced from contributing and affected parties as soon as practically possible to determine if the condition that caused the non-credible contingency event has been identified and addressed.	AEMO	31/10/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
24	15/06/2010	QLD	Loss of Swanbank B1 and B2 generating units	1. AEMO will liaise with CS Energy on the reported non-compliance of Swanbank B generating units to resolve the non-compliance in accordance with the current procedures.	AEMO	31/10/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. CS Energy will inform AEMO of the progress of installing new UPSs for the required controllers.	CS Energy	31/10/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
25	17/06/2010	VIC	Trip and auto-reclose of the Mount Beauty – Dartmouth 220 kV line and loss of West Kiewa PS units 1 and 4.	1. AGL to investigate whether setting changes need to be made to similar relays installed at other AGL power stations and to advise AEMO of the outcome of this investigation.	AGL	31/03/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. AEMO will modify the Power System Security Guidelines to ensure that following a non-credible contingency event information is sourced from contributing and affected parties as soon as practically possible to determine if the condition that caused the	AEMO	31/10/2010	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue

				non-credible contingency event has been identified and addressed.			
26	03/09/2010	SA	Tripping of Multiple 275 kV Transmission Lines Near Brinkworth Substation in South Australia	ElectraNet to inform AEMO the progress of replacing circuit breakers 6527, 6528 and 6530 at Brinkworth.	ElectraNet	Initial Completion Date: 31/12/2011 Extended Completion Date: 5/4/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
27	26/09/2010	SA	Trip of No.1 and 2 New Osborne 66kV busbars	ElectraNet will inform AEMO of the outcome of its investigation of the operation of the "Set 2" protection at Torrens Island	ElectraNet	31/01/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
28	10/11/2010	TAS	Operation of Tasmanian Network Control Special Protection System	Transend will inform AEMO of the progress of its investigation into making the reactivation of NCSPS protection logic a manual process	Transend	30/06/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
29	28/11/2010	VIC	Trip of Morwell Terminal Station (MWTS) 66 kV No. 1 busbar and Morwell Power Station (MPS).	SP AusNet will inform the reason for slow clearance of the fault on MWTS to FTR 66 kV line and the corrective action taken to AEMO.	SP AusNet	30/04/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
30	6/12/2010	QLD	Trip of Double Circuit Mackay-Collinsville Tee Proserpine (7125) and (7126) 132 kV Lines	Powerlink will inform the progress of its investigation on the auto-reclose settings of 7126 line to AEMO.	Powerlink	30/04/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
31	28/12/2010	VIC	Trip of Hazelwood No.2 220 kV bus	1. SP AusNet will inform AEMO of the cause of failure of the Hazelwood No.5 220 kV circuit breaker.	SP AusNet	31/05/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. International Power will inform AEMO of progress with installing a synchronising check relay on generating unit G5	International Power	31/05/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed

							<input type="radio"/> Overdue
				3. International Power will inform AEMO of progress in its review into installing synchronising check relays on generating units G3, G4, G6, G7 and G8.	International Power	30/06/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
32	29/12/2010	QLD	Trip of Double Circuit Mackay - Collinsville Tee - Proserpine 132 kV Line and Strathmore SVC.	Powerlink to complete their investigation of the initial loss of the power supply to Strathmore SVC's thyristor cooling system and the subsequent failure of the power supply automatic changeover system, and report their findings to AEMO.	Powerlink	01/07/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
33	06/12/2010 – 03/02/2011	SA	Waterloo bus trips between 06/12/2010 – 03/02/2011.	ElectraNet to inform AEMO of the outcome of its investigation into the auto-reclosing of Mintaro – Waterloo 132kV transmission line at Mintaro.	ElectraNet	31/05/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
34	03/01/2011	QLD	Trip of multiple 132 kV transmission lines near McKay substation and Nebo SVC	1. Ergon Energy will investigate whether the 33 kV busbar protection systems at T38 MacKay substation needs further testing, including simulation of the conditions experienced on the day to establish the 33 kV busbar protection meets the required level of reliability, dependability and security.	Ergon Energy	31/08/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. Powerlink will review the remote end protection settings to confirm that the currently applied settings are applicable for the system conditions experienced on 3 January 2011.	Powerlink	31/07/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				3. Powerlink will investigate the operation of Nebo SVC during this incident and report the corrective action required for the SVC to remain in service during severe voltage disturbances.	Powerlink	31/07/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				4. In light of this power system incident, AEMO Power System Operations will emphasize its procedure for invoking constraints to staff in	AEMO	31/07/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed



				their routine team discussions to avoid similar outcomes in future.			<input type="radio"/> Overdue
35	10/01/2011	QLD	Simultaneous trip of Braemar Power Station Units 1 and 2	1. Investigate whether any improvements can be made to the existing routine test and inspection regime of the gas yard to ensure ongoing reliability.	Alinta	15/06/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. Investigate options to improve real time data recording for future fault finding	Alinta	15/06/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				3. Install a cross over connection between the gas supply system feeding 1 and 2 generating units and the gas supply system feeding the 3 generating unit.	Alinta	15/06/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
36	10/01/2011	NSW	Glen Innes 132 kV busbar trip	TransGrid to review work practices to ensure integrity of secondary wiring prior to commencing work on any secondary circuits and advise AEMO after any updates to its relevant procedures.	TransGrid	31/05/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
37	24/01/2011	VIC	Simultaneous loss of No.1 Mount Beauty – Dederang and Mount Beauty – MacKay Creek Tee Bogong 220 kV lines	1. AGL will review its procedure for change management of protection systems and their settings. AGL will complete this action and report the outcomes to AEMO.	AGL	31/07/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. SP AusNet in conjunction with AEMO Transmission Services will review the adequacy of protection systems and settings on the No.1 and 2 MBTS to DDTS 220 kV lines, to ensure reliable and dependable operation in the presence of high impedance earth faults before such faults develop into significant failures. SP AusNet to report the outcome of this review to AEMO.	SP AusNet	Initial Completion Date: 31/07/2011  Extended Completion Date: 31/03/2013	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
38	11/02/2011	SA	Simultaneous trip of Robertstown – Para and Robertstown – Tungkillo 275	1. ETSA Utilities will investigate the cause of the trip of the Angaston generating units No.1 and 2 33 kV circuit breakers 4552 and	ETSA Utilities	31/08/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed

			kV lines	4555, review the protection relay settings if necessary to avoid tripping due to a fault on the Para – Robertstown and Robertstown – Tungkillo 275 kV lines, and report their findings to AEMO			<input type="radio"/> Overdue
				2. ElectraNet and AEMO will treat the trip of Angaston generating units No.1 and 2 as a part of the credible contingency event of the simultaneous trip of the Para – Robertstown and Robertstown – Tungkillo 275 kV lines during lightning activity in the area. This classification will be in place until ETSA Utilities advises ElectraNet and AEMO of revised protection relay settings that will avoid this simultaneous trip.	ElectraNet and AEMO	31/08/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				3. ElectraNet will send a copy of its investigation report to AEMO on back-flashover rate versus tower footing resistance and shielding wire failure.	ElectraNet	31/07/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				4. In light of this incident, AEMO will review the use of constraint automation with a view to reducing the time taken to bring the power system to a secure operating state.	AEMO	31/07/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
39	15/02/2011	SA	Trip of Keith – Snuggery 132 kV line and Snuggery No.2 132/33 kV transformer	ElectraNet will continue its investigation of the trip of Snuggery 132/33 kV No.2 transformer and provide an update to AEMO.	ElectraNet	Initial Completion Date: 31/07/2011 Extended Completion date: 30/06/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
40	13/03/2011	NSW	Trip of Mullumbimby 132 kV busbar and multiple transmission lines	APA Group to review their schedule for vegetation management adjacent to high voltage equipment and inform AEMO of the progress of the review.	APA Group	31/07/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue

41	25/04/2011	NSW	Redbank 132 kV busbar trip	Redbank Power to investigate the reason for failure of the generator transformer CB 94412 to operate on 25 April 2011 during the next scheduled outage of the generating unit. Redbank Power will inform AEMO of the progress of this investigation.	Redbank Power	30/04/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
42	02/05/2011	QLD	Trip of Columboola No.1 132 kV busbar	EECL and QGC will review operational communication procedures used in co-ordinating planned outages to avoid similar incidents in future.	QGC, EECL	30/11/2011	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
43	29/07/2011	TAS	Violation of frequency operating standards in Tasmania	1. AEMO will send Basslink Pty Ltd a copy of the specification of XVPXSPT application to explain its functionality	AEMO	31/01/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. AEMO, Transend, Basslink Pty Ltd and SP AusNet will assess and determine a suitable solution and agree on an implementation plan to resolve Basslink systems receiving two different target values at the George Town and Loy Yang converter stations on rare occasions.	AEMO, Transend, Basslink Pty Ltd, SP AusNet	30/04/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
44	18/08/2011	VIC	Trip of No.2 Eildon generating unit	1. AEMO and SP AusNet will liaise with AGL to resolve inconsistent line numbering in their respective operating diagrams and SCADA displays.	AEMO, SP AusNet	29/02/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. AEMO and SP AusNet will check whether both EPS generating units should be online for reactive power absorption before taking EPS-TTS line out of service for planned outages. If this is required AEMO and SP AusNet will update their respective outage planning procedures.	AEMO, SP AusNet	29/02/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
45	04/10/2011	VIC	Insecure Power System Operation	1. AEMO will reinforce to its staff the need to verify potential power system security issues in pre-dispatch before issuing permission to proceed for commissioning tests of new generating units	AEMO	31/03/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. AEMO to review processes for advising and	AEMO	02/02/2012	<input checked="" type="radio"/> Complete

			communicating changes to relevant participants in relation to network re-arrangements required for transmission outages.			<input type="radio"/> To be completed <input type="radio"/> Overdue	
			3. AEMO will consider the viability of using its simulation tools in outage assessments to identify power system security issues such as FCAS requirement shortfalls.	AEMO	30/06/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue	
			4. AEMO to develop documents detailing requirements for commissioning of generating units and issues considered by AEMO prior to and during commissioning, for generating units in states other than Victoria.	AEMO	31/07/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue	
46	19/10/2011	SA	Insecure Power System Operation	1. SP AusNet to notify AEMO of the outcome of its simulation based tests and investigation on the operation of CVT wiring and the mitigation strategies available to minimise the risk of similar failures in future.	SP AusNet	Initial Completion Date: 30/04/2012  Extended Completion Date: 30/04/2013	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. AEMO to review its outage assessment process to improve the method of assessing whether the FCAS requirements at times of high wind generation whenever outages of the elements of Heywood interconnector are scheduled over extended periods.	AEMO	30/06/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
47	2006 – October 2011	TAS	Insecure Power System Operation	1. AEMO and Transend will jointly identify options to maximise the power transfer capability of the Tasmanian transmission network considering the action of the NCSPS.	AEMO, Transend	31/12/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. AEMO will review and collate existing documentation on the design and operation of the NCSPS, and of other control schemes.	AEMO	30/06/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue

				3. AEMO staff will undertake refresher training on the design and operation of the NCSPS, and other control schemes.	AEMO	30/06/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
48	25/10/2011	VIC	Trip of Dederang No.1 220 kV busbar	1. SP AusNet will review and update its procedures for isolation of secondary protection systems before commencing testing of secondary equipment. <b><i>This recommendation is currently being finalised with SP AusNet.</i></b>	SP AusNet	31/05/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
				2. SP AusNet will review its method of issuing qualifications for staff to work on high voltage equipment and on secondary systems to see whether there are any gaps in the qualification process.	SP AusNet	31/05/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
49	24/10/2011 – 26/10/2011	TAS	Insecure Power System Operation	1. AEMO will implement the updated power system model for the Basslink interconnector, which will be compatible for use with the DSA application when Basslink is out of service.	AEMO	31/05/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. AEMO will improve processes so that failed and hand-dressed SCADA values are easier to identify.	AEMO	31/12/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
50	08/11/2011	NSW	Shut down of Mt.Piper power station	TransGrid will inform the status of replacing the CVTs of the MP1 switch bay to AEMO	TransGrid	31/07/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
51	09/11/2011	SA	Insecure Power System Operation	A need has been identified to provide scenario simulation training to AEMO control room operators to improve their situational awareness and responses when exposed to similar scenarios in future.	AEMO	31/05/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
52	26/11/2011	TAS	Trip of 220 kV C Busbar at Gordon Power Station	Hydro Tasmania will liaise with Transend to review the time delay implemented for its back-up protection systems of the 22 kV busbar to better align with the rating of the Neutral Earthing Transformer.	Hydro Tasmania	31/07/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue

53	29/11/2011	VIC	Trip of Ballarat – Bendigo 220 kV line and Waubra wind farm	1. SP AusNet will amend settings of its event recorders so that more important information on power system events can be kept in the records for a longer time.	SP AusNet	31/05/2012	<input type="radio"/> Complete <input type="radio"/> To be completed <input checked="" type="radio"/> Overdue
				2. Pyrenees Wind Energy Development Pty Ltd (PWED) will modify the relevant protection scheme to prevent inadvertent tripping of the wind farm due to induced voltages on the protection signalling wire between Waubra terminal station and Waubra Switching Station.	PWED	Initial Completion Date: 30/04/2012 Final Completion Date: 31/07/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
54	30/11/2011	TAS	Trip of Multiple transmission lines in Tasmania	1. Transend to investigate and conduct site testing to resolve the auto-reclose logic issue in the bay controller that disabled the single phase auto-reclose of the Chapel Street-Liapootah tee Repulse Cluny 220 kV No.1 line.	Transend	Initial Completion Date: 30/04/2012 Extended Completion Date: 30/06/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. Transend to investigate the cause for the missing relay log information at Chapel Street and Risdon substations.	Transend	30/09/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
				3. Transend to repair the relay time stamping at both Risdon and Chapel Street 110 kV protection devices.	Transend	30/09/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
55	25/12/2011	SA	Trip of Murraylink and Monash – North West Bend No.2 132 kV line	At the next convenient opportunity, APA test and confirm the correct functioning of the auxiliary supply changeover arrangements at the Murraylink Berri Converter station and advise	APA	30/09/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue

				the results of the investigation to AEMO.			
56	04/02/2012	QLD	Trip of No.2 132 kV Busbar at Pioneer Valley	Powerlink will notify AEMO if there are any relevant outcomes contained in the manufacturer's investigation report.	Powerlink	31/07/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
57	09/02/2012	NSW	Simultaneous trip of 5A6 Mt Piper – Bannaby 500 kV line and Mt Piper No.2 unit	1. Delta Electricity and TransGrid will inform AEMO of progress with their investigations into the cause of the trip of the Mt Piper No. 2 generating unit	Delta Electricity and TransGrid	31/07/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				2. TransGrid to confirm the date that the auxiliary supply to the Mt Piper switchyard will be re-configured to provide the normal supply to the 500 kV switchyard from the 330/132 kV 3H transformer	TransGrid	31/07/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
				3. TransGrid must, to the extent that TransGrid is aware or ought reasonably to have been aware, keep AEMO fully and timely informed as to the state of the security of the power system. AEMO will reinforce this requirement at the next Power System Security working group and at the regular operational meeting with the TNSPs.	TransGrid	31/10/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
58	13/02/2012	NSW	Simultaneous trip of 71 Mt Piper – Wallerawang 330 kV line and Mt Piper No.1 unit	AEMO in consultation with TransGrid and Delta Electricity will determine when the reclassification of the simultaneous trip of the 71 Mt Piper – Wallerawang 330 kV line and Mt Piper No.1 generating unit as a credible contingency event can be cancelled.	AEMO	15/06/2012	<input checked="" type="radio"/> Complete <input type="radio"/> To be completed <input type="radio"/> Overdue
59	08/03/2012	VIC	Trip of Geelong – Moorabool 220 kV lines	SP AusNet to update their field work procedures to prevent such an incident from reoccurring.	SP Ausnet	31/10/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
60	28/03/2012	NSW	Trip of Sydney West 132 kV B Busbar	TransGrid will inform AEMO of the progress in developing a longer term strategy for managing the issue for the affected CB population.	TransGrid	31/08/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue

61	18/04/2012	TAS	Potential Insecure Power System Operation due to NCSPS operation	1. Transend to modify the implementation or design of the NCSPS to ensure security of the Tasmanian power system.	Transend	30/09/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
				2. Transend to advise AEMO of any changes made to the implementation or design of the NCSPS prior to it returning to service, to allow AEMO to confirm the security of the Tasmanian power system.		30/09/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
62	18/04/2012	TAS	Insecure operation in Tasmania	AEMO will investigate whether the constraint equation specifying the R6 FCAS requirement in Tasmania could be improved to provide a more accurate indication of the requirement in the Pre-dispatch time frame.	AEMO	31/12/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
63	16/06/2012	QLD	Trip of Belmont No.7 110 kV busbar	1. Powerlink will return the No.7 110 kV capacitor bank to service after repairs to the CB 4872 are completed.	Powerlink	31/10/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue
				2. Powerlink will investigate the possibility of enhancing the protection systems associated with CBs which have similar settings to the CB 4872 such that faster detection of unsuccessful switching can be achieved.	Powerlink	31/12/2012	<input type="radio"/> Complete <input checked="" type="radio"/> To be completed <input type="radio"/> Overdue