TEMPLATE EXPLANATION

This template must be used by the TNSP to report on the implementation of their priority projects for the previous calendar year. This report template is to be submitted by the TNSP to the AER as part of the annual STPIS compliance review.

After the initial report template is filled out and provided by TNSPs in the first STPIS compliance review for the regulatory control period for which the NCIPAP applies, the TNSP will update the report template at the end of each calendar year and provide a updated copy to the AER as part of the annual STPIS compliance review.

The summary worksheet provides an overview of the priority projects and whether, at the time of submitting this NCIPAP reporting template, the TNSP has taken steps to implement any of its priority projects and/or completed any of its priority projects.

One priority project worksheet should be filled out for each priority project in the TNSP's NCIPAP. These worksheets will be used by the TNSP to provide updates on the status of the implementation of the priority projects. If the TNSP successfully implements a priority project, takes steps towards the delivery on a priority project or encounters delays in a priority project in the previous calendar year, the priority project worksheet should be updated to reflect this and the summary should also be updated.

This template also provides worksheet templates for TNSPs which want to, as part of the STPIS compliance review, remove priority projects from their NCIPAP and propose a replacement priority project to be added to the NCIPAP.

Priority project name and ranking	Summary of project	Have steps been taken in the previous calendar year to implement the priority project?	Priority project completion summary		
			Has the priority project been delivered?	Has the priority project improvement target been achieved?	If the priority project has been delivered, has AEMO been notified of any change in the limit?
	Explanatory statement: include a short description of the priority project	Explanatory statement: indicate 'yes' or 'no' as to whether any steps have been taken by the TNSP to implement the priority project in the previous calendar year. If steps have been taken by the TNSP to implement the priority project in the previous calendar year, please update the worksheet for the priority project.	Explanatory statement: indicate 'yes' or 'no' as to whether the priority project has been delivered.	Explanatory statement: indicate 'yes' or 'no' as to whether the improvement target has been achieved following the completion of the priority project. If the improvement target has not been achieved despite the completion of the priority project, please provide further information in row 15 of the relevant priority project worksheet.	Explanatory statement: indicate if AEMO has been made aware, for operational purposes, of the change in the limit.
1. Fifteen Minutes Transient Rating for Transmission Lines	All transmission lines that are currently controlled through AEMO's generation dispatch	Yes	No	No	Not applicable as project is not completed
2. Knights Road Substation supply transformer dynamic rating	Dynamic rating of Knights Road Substation supply transformers	Yes	No	No	Not applicable as project is not completed
3. !!!!!! Substation supply transformer dynamic rating	Dynamic rating of substation supply transformers	Yes	No	No	Not applicable as project is not completed
4. Installation of new line fault indicators	Farrell-Que-Savage River-Hampshire, Farrell-Rosebery-Queenstown, Norwood-Scottsdale-Derby and Lindisfarne-Sorell-Triabunna 110 kV transmission circuits	Yes	No	No	Not applicable as project is not completed
5. Review and optimisation of Operational Margins for TasNetworks limit equations	All transmission circuits whose flow is controlled by AEMO constraint equations	Yes	No	No	Not applicable as project is not completed
6. Line fault indicator (LFI) remote communications	Palmerston-Avoca and Knights Road-Huon River-Kermandie 110kV transmission circuits	Yes	No	No	Not applicable as project is not completed
7. Basslink Tasmania-Victoria interconnector	George Town automatic voltage control scheme (GTAVCS) 2.0	Yes	Yes	Yes	Yes - Design has been submitted to AEMO
8. All 220/110kV Network Transformers	Dynamic rating of all 220/110 kV network transformers	No	No	No	Not applicable as project is not completed
10. Sheffield-George Town 220 kV transmission line	Replace disconnectors, CT and bay conductor to achieve line rating increase and reduce market constraints	Yes	No	No	Not applicable as project is not completed
11.Weather stations at Creek Road, Chapel Street, Devonport, Trevallyn, Hadspen, Sheffield, and Farrell substations	Weather station telemetry renewal	No	No	No	Not applicable as project is not completed
12. Liapootah-Waddamana-Palmerston No 1, Liapootah-Cluny-Repulse-Chapel Street No 1, Liapootah-Chapel Street No 2 and George Town-Comalco No 4 & 5 220 kV	Upgrade of dead end fittings on selected transmission lines	Yes	Yes (one individual project component is complete)	No	Not applicable as project is not completed
13. Substandard spans verification and rectification	Palmerston-Avoca transmission circuit	No	No	No	Not applicable as project is not completed
14. Castle Forbes Bay Tee Switching Station	Castle Forbes Bay Tee Switching Station disconnector upgrade	Yes	No	No	Not applicable as project is not completed
15.Transmission line surge diverter installation and tower footing earthing improvements	Sheffield-Farrell 1 & 2, Farrell-Reece 1 & 2, Farrell-John Butters 220kV and Farrell-Rosebery-Queenstown 110 kV transmission circuits	No	No	No	Not applicable as project is not completed
16. Knights Road-Kermandie transmission circuit	Substandard spans verification and rectification	No	No	No	Not applicable as project is not completed
17. Palmerston-Hadspen No 1&2 220 kV, Palmerston-Sheffield 220 kV and Sheffield-Burnie No 1 220 kV	Installation of modern fault location functionality on selected transmission circuits	No	No	No	Not applicable as project is not completed
18. Chapel Street Substation 110 kV bus coupler	Installation of a second 110 kV bus coupler	No	No	No	Not applicable as project is not completed
Removed Priority Projects					
9. Sheffield – Devonport transmission circuit	Substandard spans verification and rectification	No	No	No	This project is removed from priority list
16 Savage River Spur transmission circuit	Substandard spans verification and rectification	No	No	No	This project is removed from priority list
Proposed Replacement Priority Project and Ranking					
9. Liapootah-Waddamana No. 1 220 kV (TL 502) and Tungatinah-Waddamana No. 1 &2 110 kV transmission circuits	Substandard spans verification and rectification	Yes	No	No	Not applicable as project is not completed

NOTE: summary page to be automated to link to priority projects sheets

Priority project name and ranking	1. Fifteen Minutes Transient Rating for Transmission Lines
Priority project description	TasNetworks computes the continuous rating of the EHV transmission lines using the real time measurement of ambient conditions such as ambient temperature and wind velocity. This rating is used by AEMO and TasNetworks to limit the line loadings and the post continuous flows below the continuous rating. Additional transmission line capacity can be realised by using real time transient ratings (fifteen minute dynamic rating) and using the transient rating to dispatch the generators. Fifteen minute rating gives the maximum current that can be permitted in the conductor for duration of up to fifteen minutes without violating the maximum conductor temperature. Under most conditions, dynamic short time ratings are above the continuous line rating. During contingency events the line will be permitted to carry a firm rating current corresponding to the fifteen minute rating. During the period following the contingency, AEMO's generation dispatch mechanism can be used to regulate the current in the overloaded line below the continuous rating. The additional line capacity that can be achieved by using the short time line rating varies between 5 to 20 % depending upon the conductor properties, transmission line construction (stringing) and the ambient conditions. Additional short time capacity is available during low wind conditions. The scheme can be implemented for non-NCSPS protected lines that are currently monitored by AEMO using thermal limit equations. If required the scheme can also be extended to NCSPS lines during periods when the NCSPS is not in operation. TasNetworks computes the continuous rating of the EHV transmission lines using the real time measurement of ambient conditions such as ambient temperature and wind velocity. This rating is used by AEMO and TasNetworks to limit the line loadings and the post continuous flows below the continuous rating.
Co-ordinated project	This is not a co-ordinated project.
Has the priority project been commenced ?	Yes
Date of priority project completion	December-16
Limit(s) addressed by priority project	Thermal limit of all non- NCSPS circuits. In order to release additional capacity while ensuring appropriate ground clearances are maintained.
Initial limit value(s)	The continuous dynamic thermal rating.
Target limit value(s)	Availability of 15-min rating of transmission lines dynamically for real-time operation.
Completion limit values	Based on the initial analysis carried out, following benefits can be achieved: a) An additional line capacity of 5 to 20 % can be achieved depending upon the conductor properties, transmission line construction (stringing) and the ambient conditions. b) The scheme is found to provide an additional capacity of 10 to 20 % levels during low wind conditions. This will provide boost to transmission capacity during adverse high temperature and low wind conditions. c) The scheme requires no additional control mechanisms to regulate the line flow and can use AEMO's existing generation dispatch engine to reduce the overload. d) The same computation methodology can be extended to provide two minute dynamic ratings that are required for future NCSPS schemes.
Estimated capital cost of priority project	$40,000
Estimated operating cost of priority project	$0
Capital expenditure to date	$19,000
Operating expenditure to date	$0
Priority project key milestones and dates	The key milestones for this project are : ● Internal approval was completed in April 2014 ● Project commenced and transmission line decoding has been completed in December 2015 ● Pilot testing on selected non-NCSPS transmission circuits is planned to be run for six months and be completed by October 2016. ● First stage of project is scheduled to be completed by December 2016. ● Second stage of project will be commenced in January 2017.
Priority project update/comments	This project is commenced and schedule completion planned by December 2016.

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Priority project name and ranking	2. Knights Road Substation supply transformer dynamic rating
Priority project description	The load at Knights Road Substation exceeds the firm rating of transformers T1 and T2 which is 20MVA. Implementation of dynamic rating for these transformers will result in these transformers being able to supply in excess of their name plate rating in the event of loss of any one of their associated parallel unit. Taking into account the dynamic rating and ability to monitor temperature increase and life degradation of the transformers will enable the load at Knights Road to be supplied in excess of transformer name plate rating.
Co-ordinated project	This is not a co-ordinated project.
Has the priority project been commenced ?	Yes
Date of priority project completion	June-16
Limit(s) addressed by priority project	Availability of dynamic ratings from the transformers T1 and T2 at Knights Road Substation.
Initial limit value(s)	The transformers T1 and T2 have a current firm name plate limit of 20MVA.
Target limit value(s)	Ratings of transformers are made using weighted ambient of 20degC. Possibility of using DRMCC at sites such as Knights Road, where load is over firm name plate rating, and utilise actual winter peak ambient (about 10DegC) which would increase load rating of transformers.
Completion limit values	Additional 2 MVA capacity subjected to ambient temperature
Estimated capital cost of priority project	$150,000
Estimated operating cost of priority project	$16,000
Capital expenditure to date	$28,000
Operating expenditure to date	$0
Priority project key milestones and dates	Key milestones for this project are: ● Internal approval process was completed in February 2015 ● Procurement of equipment was completed in April 2015 ● Project Implementation is targeted between February 2016 and May 2016 ● Project is targeted to be completed by June 2016
Priority project update/comments	

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Priority project name and ranking	3. !!!!!! Substation supply transformer dynamic rating
Priority project description	!!!!!! Substation has the heaviest loaded transformers in the transmission network. T1 and T2 operate in parallel, as do !!! and !!!. The loss of any one transformer will result in the remaining being overloaded and result in the connected customer (!!!!!!) needing to reduce load to keep equipment within rating. Any reduction in load for !!!!!! has a detrimental and costly impact on their production since it is a process based plant
Co-ordinated project	This is not a coordinated project
Has the priority project been commenced ?	Yes
Date of priority project completion	August-16
Limit(s) addressed by priority project	Increased transformation capacity of transformer
Initial limit value(s)	The transformers T1 and T2 have a current firm limit of 22.5MVA. !!! and !!! have firm rating of 63MVA.
Target limit value(s)	Availability of dynamic ratings from the transformers T1, T2, !!! and !!! at !!!!!!.
Completion limit values	Application of dynamic ratings of the transformers referred above in real time operation.
Estimated capital cost of priority project	$180,000
Estimated operating cost of priority project	$20,000
Capital expenditure to date	$30,000
Operating expenditure to date	$0
Priority project key milestones and dates	Key milestone dates are: ● Internal approval process was completed in June 2015 ● Equipment procurement was completed in December 2015 ● Installation, commissioning and testing on transformer T1 is expected to be completed by March 2016. ● Project operational completion is expected to be completed by June 2016 subjected to outage available on transforemer T2. ● Project handover is targeted by August 2016
Priority project update/comments	Project commenced in June 2015.

EXPLANATORY NOTE

In the first NCIPAP compliance report for a new regulatory control period, please fill out rows 1-3, 7-8, 10-11 and 14 for each priority project.

In following NCIPAP compliance report updates, the worksheet only needs to be updated where:

- **if during the previous calendar year the TNSP undertakes steps to implement a priority project (in this instance, updates may be needed for rows 4, 12, 13, 14 and 15)**
- **if during the previous calendar year, events occur which result in the priority project key milestone dates being changed (please update this rows 14 and 15 of this worksheet), or**
- **if the priority project has been completed in the previous calendar year (if this is the case, fill out rows 5 and 9 and ensure rows 4, 12, 13, 14 and 15 are up to date)**

If this worksheet is updated, please update the summary worksheet to indicate changes have been made.

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Priority project name and ranking	4. Installation of new line fault indicators
Priority project description	Sustained fault outages on radial transmission circuits will result in outages to all connected customers. The circuits listed above are all radial in nature and have experienced 38 sustained fault outages in the last 10 years, causing the loss of approximately 1100 MWhrs of energy and of which 20 fault outages caused a loss of supply greater than 0.1 system minutes. The installation of line fault indicators with remote communication capabilities will facilitate the transmission of fault data to the control room, significantly reducing fault patrol times and the commencement of fault restoration activities. The selected line for this project are: Farrell-Que-Savage River-Hampshire, Farrell-Rosebery-Queenstown, Norwood-Scottsdale-Derby and Lindisfarne-Sorell-Triabunna 110 kV transmission circuits
Co-ordinated project	This is not a co-ordinated project
Has the priority project been commenced ?	Yes
Date of priority project completion	June-16
Limit(s) addressed by priority project	Reduced fault outage restoration times
Initial limit value(s)	Fault restoration time is several hours. Currently tee-off transmission lines are physically patrolled (post- contingency) to identify downstream fault
Target limit value(s)	Reduced fault outage restoration times (5-30 minutes)
Completion limit values	Reduced fault outage restoration times (5-30 minutes)
Estimated capital cost of priority project	$230,000
Estimated operating cost of priority project	$19,000
Capital expenditure to date	$0
Operating expenditure to date	$0
Priority project key milestones and dates	Key milestones for this project are: ● Internal approval was completion in June 2015 ● Procurement of equipment is targeted to be completed by March 2016 ● Project implementation and commissioning is targeted between October-November 2016 ● Project completion by December 2015
Priority project update/comments	A detailed investigation to project scope identified that installation of line fault indicators will be only required at Waratah-Tee on Farrell-Que-Savage River-Hampshire 110 kV and at Triabunna spur on Lindisfarne-Sorell-Triabunna 110 kV transmission circuits. The Farrell-Rosebery-Queenstown 110 kV and Norwood-Scottsdale-Derby 110 kV transmission circuits are now installed with relay having distance to fault location capability. Therefore, installation of line fault indicators on Farrell-Rosebery-Queenstown and Norwood-Scottsdale-Derby 110 kV transmission circuits are deemed no longer necessary.

EXPLANATORY NOTE

In the first NCIPAP compliance report for a new regulatory control period, please fill out rows 1-3, 7-8, 10-11 and 14 for each priority project.

In following NCIPAP compliance report updates, the worksheet only needs to be updated where:

- **if during the previous calendar year the TNSP undertakes steps to implement a priority project (in this instance, updates may be needed for rows 4, 12, 13, 14 and 15)**
- **if during the previous calendar year, events occur which result in the priority project key milestone dates being changed (please update this rows 14 and 15 of this worksheet), or**
- **if the priority project has been completed in the previous calendar year (if this is the case, fill out rows 5 and 9 and ensure rows 4, 12, 13, 14 and 15 are up to date)**

If this worksheet is updated, please update the summary worksheet to indicate changes have been made.

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Priority project name and ranking	5. Review and optimisation of operational margins for TasNetworks limit equations
Priority project description	The project will involve tasking a system analyst with gathering all instances of where thermal constraints have been binding or violating and then comparing the actual flows with the raw limit and determining if it is possible to relax the operating margin without unreasonably increasing the probability of exceeding the rating of the circuit. It is essentially an exercise in capturing and analysing historical data. The deliverable from this project will be the submission of an updated TasNetworks operational margins paper to AEMO for implementation.
Co-ordinated project	This is not a co-ordinated project
Has the priority project been commenced ?	Yes
Date of priority project completion	June-15
Limit(s) addressed by priority project	The thermal limit equations are intended to ensure that circuits are not operated beyond their thermal rating post-contingency. The default limit in all thermal constraints is 11 %
Initial limit value(s)	The default operational margin for all transmission lines is 11%
Target limit value(s)	Identify one or more circuits where operating margins can be reduced below 11 per cent.
Completion limit values	This is the outcome of the project.
Estimated capital cost of priority project	$0
Estimated operating cost of priority project	$35,000
Capital expenditure to date	$0
Operating expenditure to date	$16,000
Priority project key milestones and dates	Key milestones for this project are: ● Internal approval process was completed in July 2015 ● Limit equation and operational margin analysis will be undertaken between November 2015 and April 2016 ● Project outcome (a report) with revised operational margin will be sent to AEMO for approval ● Subjected to AEMO's approval on new operational margin to TasNetworks' limit equations, new operational margins are rolled out and equations are modified by December 2016
Priority project update/comments	None

EXPLANATORY NOTE

In the first NCIPAP compliance report for a new regulatory control period, please fill out rows 1-3, 7-8, 10-11 and 14 for each priority project.

In following NCIPAP compliance report updates, the worksheet only needs to be updated where:

- **if during the previous calendar year the TNSP undertakes steps to implement a priority project (in this instance, updates may be needed for rows 4, 12, 13, 14 and 15)**
- **if during the previous calendar year, events occur which result in the priority project key milestone dates being changed (please update this rows 14 and 15 of this worksheet), or**
- **if the priority project has been completed in the previous calendar year (if this is the case, fill out rows 5 and 9 and ensure rows 4, 12, 13, 14 and 15 are up to date)**

If this worksheet is updated, please update the summary worksheet to indicate changes have been made.

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Priority project name and ranking	6. Line fault indicator (LFI) remote communications
Priority project description	Avoca, St Marys, Kermandie and Huon River substations are radially supplied by single 110kV circuits. To assist in fault finding activities, LFIs have been installed on the Pamerston–Avoca and Knights Rd–Huon River–Kermandie 110kV circuits. These LFIs: • geographically divide the 64km PM–AV line into two sections, reducing the time taken to locate a transmission line fault by up to 50 per cent; and • indicate if a fault is present on the Huon Valley Spur, allowing operators to immediately restore supply to Kermandie Substation. Presently these devices have local indication only and therefore fault location information is only available once an operator has attended site, which could take up to 1 hour from the nearest service depot. The provision of remote communications would provide System Controllers with the ability to direct field crews straight to the faulted circuit section, rather than needing to first visit the location of the line fault indicators to check their status. The installation of remote switching at Castle Forbes Bay Tee would further reduce fault outage restoration times, for those instances where the fault is located on the Huon River Spur.
Co-ordinated project	This not a co-ordinated project
Has the priority project been commenced ?	Yes
Date of priority project completion	December-16
Limit(s) addressed by priority project	Reduced fault outage durations
Initial limit value(s)	Fault restoration time is several hours. Currently tee-off transmission lines are physically patrolled (post- contingency) to identify downstream fault
Target limit value(s)	5-30 minutes
Completion limit values	Fault restoration time could be reduced to 5-30 minutes
Estimated capital cost of priority project	$60,000
Estimated operating cost of priority project	$0
Capital expenditure to date	$15,000
Operating expenditure to date	$0
Priority project key milestones and dates	Key milestones for this project are: ● Internal approval process completed in March 2015 ● Equipment procurement is expected to be completed by February 2016 ● Installation, testing and commissioning is completed by June 2016 ● Operation completion is targeted by June 2016 with project handover by December 2016
Priority project update/comments	A detailed investigation to project scope identified that installattion of line fault indicators will be only required at Castle Forbes Bay (Huon-Tee) on Knigths Road-Kermandie-Huon River 110 kV transmission circuit. The Palmerston-Avoca-St Marys 110 kV transmission circuit is now installed with relay having distance to fault location capability. Therefore, installation of line fault indicators on Palmerston-Avoca-St Marys 110 kV transmission circuit is deemed no longer necessary.

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Priority project name and ranking	7. Basslink Tasmania-Victoria Interconnector
Priority project description	The reduction in 220 kV fault level at George Town has resulted in issues associated with the switching of the 98 MVAR Basslink filter. This project achieves reengineering of the GTAVCS for improved voltage control during low fault levels at George Town to allow for increased transfer from TAS to VIC. The project is renamed as NAVS (Network Automatic Voltage Scheme).
Co-ordinated project	This is not a co-ordinated project
Has the priority project been commenced ?	Yes
Date of priority project completion	December-15
Limit(s) addressed by priority project	Removal of the requirement for manual intervention in the control of 220 kV voltage levels at George Town Substation.
Initial limit value(s)	After the commissioning of Basslink the GTAVCS was implemented to reduce the amount of manual intervention required to manage the steady state George Town 220 kV voltage. This scheme was tuned on the basis that the combined cycle gas turbine connected to George Town would be a base load generator. With the change in operating patterns of this generator and the connection of more non synchronous generation the GTAVCS needs to be reengineered to take better account of the changed operating conditions.
Target limit value(s)	Improved, automated voltage control at George Town 220 kV bus at times of low fault level and Basslink export levels 300 MW or higher
Completion limit values	This project has been delivered and operating successfully.
Estimated capital cost of priority project	$480,000
Estimated operating cost of priority project	$0
Capital expenditure to date	$76,000
Operating expenditure to date	$0
Priority project key milestones and dates	Project has been delivered and has been confirmed to be operating successfully.
Priority project update/comments	TasNetworks identified an opportunity in 2013 to commence work on this project and deliver market benefits earlier than originally anticipated. Project completion occurred in late 2014 with expenditure between July 2014 and December 2014 of $30,000.

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Priority project name and ranking	8. All 220/110kV Network Transformers.
Priority project description	Purchase and install dynamic rating, monitoring, control and communication units on 220/110kV network transformers at Farrell (T1 & T2), Sheffield (T1 & T2), Hadspen (T1 & T2) and Palmerston (T1) substations and implement dynamic rating functionality. Implement dynamic rating functionality on all other existing network transformers in system, i.e.. Burnie (T2), George Town (T1, T2 & T3), Chapel St (T1, T2, T3 & T4) and Lindisfarne (T4 & T5) as these transformers already have DRMCC's installed.
Co-ordinated project	This is not a co-ordinated project
Has the priority project been commenced ?	No
Date of priority project completion	December-19
Limit(s) addressed by priority project	The network transformers are presently rated based on the condition level degrading over time due to various factors including loading, fault current, and age based asset condition factors. Typically time based test and maintenance will provide an overview of the asset condition. Engineering knowledge and analysis tools are utilised in ascertaining remaining life of these transformers.
Initial limit value(s)	Existing continuous and emergency static ratings.
Target limit value(s)	The transformers listed above will have dynamic rating capability continuously monitored, reported and applied in real time operation.
Completion limit values	The transformers listed above will have dynamic rating capability continuously monitored, reported and applied in real time operation.
Estimated capital cost of priority project	$900,000
Estimated operating cost of priority project	$58,000
Capital expenditure to date	$0
Operating expenditure to date	$0
Priority project key milestones and dates	Key milestones for this project are: ● Project implementation and commissioning dates differ for various network transformers as this project is spread over three fiscal years 2015-16, 2016-17 and 2017-18. ● Project completion for Farrell Substation T1 and T2 network transformers is targeted by December 2016 ● Project completion for Sheffield Substation T1 and T2 network transformers is targeted by December 2017 ●Project completion for Hadspen Substation T1 and T2 network transformers is targeted by December 2018 ● Project completion for Palmerston Substation T1 network transformer is targeted by December 2019.
Priority project update/comments	

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Priority project name and ranking	10. Sheffield-George Town 220 kV transmission line
Priority project description	Replace present limiting terminal equipment at Sheffield Substation on the SH-GT 1 and 2 220 kV transmission circuits to increase their circuit terminal ratings to 2000A to reduce market constraints.
Co-ordinated project	This is not a co-ordinated project.
Has the priority project been commenced ?	Yes
Date of priority project completion	July-16
Limit(s) addressed by priority project	Elimination of thermal constraints in Sheffield-George Town 220 kV transmission corridor.
Initial limit value(s)	SH-GT 1 220 kV: 1200A terminal rating at Sheffield Substation SH-GT 2 220 kV: 1250A terminal rating at Sheffield Substation
Target limit value(s)	SH-GT 1 220 kV: 2000A terminal rating at Sheffield Substation SH-GT 2 220 kV: 2000A terminal rating at Sheffield Substation
Completion limit values	SH-GT 1 220 kV: 2000A terminal rating at Sheffield Substation SH-GT 2 220 kV: 2000A terminal rating at Sheffield Substation
Estimated capital cost of priority project	$1,120,000
Estimated operating cost of priority project	$0
Capital expenditure to date	$200,000
Operating expenditure to date	$0
Priority project key milestones and dates	Key milestone for this project are: ● Internal approval process was completed in May 2015 ● Detail design and procurement of primary equipment were completed in December 2015 ● Installation of new disconnectors are targeted by May 2016 ● Operational completion to install new disconnectors is expected to be completed by June 2016
Priority project update/comments	

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Priority project name and ranking	**11. Weather stations at Creek Road, Chapel Street, Devonport, Trevallyn, Hadspen, Sheffield, and Farrell substations**
Priority project description	Relocation and/or upgrade of weather station assets at seven sites.
Co-ordinated project	This is not a co-ordinated project.
Has the priority project been commenced ?	Yes
Date of priority project completion	December-19
Limit(s) addressed by priority project	The upgrade of weather station telemetry at sites where assets are approaching end of life, replacing these assets with new low-power assets with a lower lifecycle cost. The relocation of weather station assets from inside TasNetworks' substations to a secure location outside the switchyard. This relocation will facilitate more effective site access, removing the requirement for an EHV Substation Operator to attend, at lower ongoing cost to TasNetworks, while also providing data with greater accuracy than is currently supplied.
Initial limit value(s)	Renewal of weather stations, ensuring that these sites continue to provide accurate and reliable atmospheric data in the long term, at the lowest whole of life cost to consumers.
Target limit value(s)	Relocation and/or upgrade of weather station assets at seven sites.
Completion limit values	Relocation and/or upgrade of weather station assets at seven sites.
Estimated capital cost of priority project	$1.05 million
Estimated operating cost of priority project	$0
Capital expenditure to date	$82,000
Operating expenditure to date	$0
Priority project key milestones and dates	This project is undertaken in several stages. Key milestones to replace and upgrade of weather station projects are: ● Renew and upgrade of weather station at Creek Road Substation station was completed in November 2015. ● Internal approval to undertake weather station upgrade at Chapel Street and Farrell Substations was completed in November 2015 with project completion is targeted by December 2016 ● Weather station upgrade at Hadspen and Sheffield Substations are targeted by December 2017 ● Weather station upgrade at Hadspen and Devonport Substations are targeted by December 2018
Priority project update/comments	

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Priority project name and ranking	12. Liapootah-Waddamana-Palmerston No 1, Liapootah-Cluny-Repulse-Chapel Street No 1, Liapootah-Chapel Street No 2 and George Town-Comalco No 4 & 5 220 kV transmission circuits. Hadspen-Norwood No 1 & 2 110 kV transmission circuits.
Priority project description	Upgrade of dead end fittings on selected transmission lines
Co-ordinated project	This is not a co-ordinated project
Has the priority project been commenced ?	Yes
Date of priority project completion	June-17
Limit(s) addressed by priority project	Compression dead end fittings installed on five 220 kV and two 110 kV transmission circuits have a lower rating than that of the conductors to which the fittings are attached. The lower rating is due to the insufficient surface area at the point of connection between the fitting and the conductor palm, hence limiting current flow. This issue can impact on the 220 kV transmission corridor south of Palmerston during Basslink import, particularly under N-1 contingency situations. Under such circumstances, the power flow could be restricted to the firm capacity of the under rated dead end fittings. This will severely impact north-south power flow during winter months to supply southern loads.
Initial limit value(s)	The present Winter limits are: LI-WA-PM 1 220 kV – 840 A LI-CL-RE-CS 1 220 kV – 851 A LI-CS 2 220 kV – 851 A GT-CO 4&5 220 kV – 938 A HA-NW 1&2 110 kV – 840 A
Target limit value(s)	The target Winter limits are: LI-WA-PM 1 220 kV – 987 A LI-CL-RE-CS 1 220 kV – 873 A LI-CS 2 220 kV – 873 A GT-CO 4&5 220 kV – 1032 A HA-NW 1&2 110 kV – 949 A
Completion limit values	The target Winter limits are: LI-WA-PM 1 220 kV – 987 A LI-CL-RE-CS 1 220 kV – 873 A LI-CS 2 220 kV – 873 A GT-CO 4&5 220 kV – 1032 A HA-NW 1&2 110 kV – 949 A
Estimated capital cost of priority project	$840,000
Estimated operating cost of priority project	$0
Capital expenditure to date	$99,000
Operating expenditure to date	$0
Priority project key milestones and dates	Upgrade of dead end fitting program comprises of several individual projects. These projects are undertaken in several stages on selected 220 kV and 110 kV transmission circuits. Details of each project component are: ● Upgrade of dead end fittings on Liapootah-Waddamana-Palmerston No.1 220 kV transmission circuits was completed in September 2014. ● Upgrade of dead end fittings on George Town-Comalco No 4 220 kV was completed in July 2015 and remaining works on George Town Comalco No 5 220 kV is scheduled to be completed in March 2016 ● Upgrade of dead end fittings on Liapootah-Cluny-Repulse-Chapel St No.1 220 kV and Liapootah-Chapel Street No 2 transmission circuits are targeted be completed by December 2016 ● Upgrade of dead end fittings on Hadspen-Norwood No 1 & 2 110 kV transmission circuits will be completed by December 2017.
Priority project update/comments	Two project components to upgrade dead end fittings on Liapootah-Waddamana-Palmerston No 1 220 kV transmission circuit and George Town- Comalco No 4 220 kV transmission circuit were completed and the target limits for these two transmission circuit have been achieved.

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Priority project name and ranking	**13. Palmerston-Avoca transmission circuit- substandard clearance and rectification**
Priority project description	Substandard spans verification and rectification
Co-ordinated project	This is not a co-ordinated project
Has the priority project been commenced ?	No
Date of priority project completion	December-16
Limit(s) addressed by priority project	LIDAR survey of transmission lines at risk of substandard clearances and remedial works to rectify identified substandard clearances.
Initial limit value(s)	Existing transmission line design temperature.
Target limit value(s)	Increased transmission line design temperature depending on completion of LIDAR surveys
Completion limit values	Increased transmission line design temperature.
Estimated capital cost of priority project	$926,000
Estimated operating cost of priority project	$0
Capital expenditure to date	$0
Operating expenditure to date	$0
Priority project key milestones and dates	Key milestone for this project are: ● TasNetworks is reviewing historical survey records, as this may negate the need for LIDAR expenditure for this transmission line Completion of internal approval is expected to be completed in February 2016. ● Ground profiling, re-tensioning works to be completed by November 2016 to meet increased transmission line design temperature. ● Project completion is targeted by December 2016.
Priority project update/comments	

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Priority project name and ranking	14. Castle Forbes Bay Tee Switching Station
Priority project description	Replace manual 110kV disconnector at Castle Forbes Bay Tee with a remotely operable 110kV disconnector to reduce the duration of unplanned outages affecting customers connected from Kermandie and Huon River Substation.
Co-ordinated project	This is not a co-ordinated project.
Has the priority project been commenced ?	Yes
Date of priority project completion	December-16
Limit(s) addressed by priority project	Reduce the duration of unplanned outages for customers supplied from Kermandie and Huon River substations, where the cause of the outage is on the Huon River Spur.
Initial limit value(s)	Current restoration time ranges from an hour to several hours depending on time of the fault
Target limit value(s)	After completion of this project the circuit restoration time could potentially reduce to 5-30 minutes
Completion limit values	After completion of this project the circuit restoration time could potentially reduce to 5-30 minutes
Estimated capital cost of priority project	$250,000
Estimated operating cost of priority project	$0
Capital expenditure to date	$134,000
Operating expenditure to date	$0
Priority project key milestones and dates	Key milestone for this project are : ● Internal approval process was completed in February 2015 ● Procurement of primary equipment (motor operated load make/break disconnector) expected to be completed by April 2016 ● Installation and commissioning by November 2016 ● Project completion by December 2016
Priority project update/comments	Project delivery is dependent of lead delivery time of primary equipment

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Priority project name and ranking	15.Transmission line surge diverter installation and tower footing earthing improvements
Priority project description	In the last 10 years transmission circuits Sheffield–Farrell No. 1&2 220kV, Farrell–Reece No. 1&2 220kV, Farrell–John Butters 220kV, (radial single circuit to generator) and Farrell–Rosebery–Queenstown 110kV (radial single circuit to load) have experienced 28 sustained fault outages due to lightning. This performance is suboptimal with a significant proportion of these outages suspected to be due to 'back-flashover'. This has resulted in a number of double circuit outages and subsequent placement of these circuits on the vulnerable status list, resulting in network constraints during lightning storm activity. The installation of surge diverters in strategic locations and the improvement of tower footing earthing will reduce the voltage surge to which a transmission circuit is subjected as a result of a lightning strike, minimising the likelihood of flashover and subsequent unplanned circuit outage.
Co-ordinated project	This is not a co-ordinated project.
Has the priority project been commenced ?	Yes
Date of priority project completion	June-17
Limit(s) addressed by priority project	Reduced unplanned outage frequency due to lightning.
Initial limit value(s)	Unacceptable transmission line lightning performance at an average of 2.8 sustained fault outages due to lightning per annum on the circuits identified above.
Target limit value(s)	Reduced unplanned outage frequency due to lightning.
Completion limit values	Reduced unplanned outage frequency due to lightning.
Estimated capital cost of priority project	$550,000
Estimated operating cost of priority project	$0
Capital expenditure to date	$0
Operating expenditure to date	$0
Priority project key milestones and dates	This project is undertaken in several stages. Key milestones for this project are : ● Internal approval is targeted to be complted by March 2016 ● Detail design to be complted by June 2016 ● Earth resistance improvement for selected transmission corridors willl comence in November 2016 ● Project completion is targeted by December 2017
Priority project update/comments	Scope to identify critical transmission tower with exposures and high footing resistance is already commenced. The scope of this project is expected to finalised by March 2016

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Priority project name and ranking	16. Knights Road-Kermandie transmission circuit
Priority project description	It is suspected that a number of transmission circuits spans may have substandard ground clearances. Through minimal investment, rectification of these spans will achieve compliance, and is also likely to result in an increase in line rating and capability
Co-ordinated project	This is not a co-ordinated project
Has the priority project been commenced ?	No
Date of priority project completion	July-19
Limit(s) addressed by priority project	LIDAR survey of transmission lines at risk of substandard clearances and remedial works to rectify identified substandard clearances.
Initial limit value(s)	Existing transmission line design temperature.
Target limit value(s)	Increased transmission line design temperature by removing substandard clearances on selected spans after LIDAR verification.
Completion limit values	Increased transmission line design temperature.
Estimated capital cost of priority project	$291,000
Estimated operating cost of priority project	$0
Capital expenditure to date	$0
Operating expenditure to date	$0
Priority project key milestones and dates	Key milestone for this project are: ● Internal approval is expected to be completed in November 2017. ● Completion of LIDAR survey by June 2018. ● Ground profiling, re-tensioning works required to meet increased transmission line design temperature is expected to be udnertaken between May 2019 and August 2019. ● Project Completion by December 2019.
Priority project update/comments	TasNetworks is reviewing historical survey records, as this may negate the need for LIDAR expenditure for this transmission line.

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Priority project name and ranking	17. Installation of modern fault indicators on selected 220 kV transmisison circuits
Priority project description	The protection relays for the Burnie–Sheffield No.1, Palmerston–Sheffield and the Palmerston–Hadspen No.1 and No.2 220 kV transmission lines are early model microprocessor technology and are not due for renewal. In the event that a fault occurs on any of these critical transmission lines, early restoration times are paramount and it is proven that fault location facilities of modern protection relays assists greatly in guiding transmission line maintenance crews to the area of the fault. The relays on Burnie–Sheffield No.1 have no fault location functionality whilst the relay used on Palmerston–Sheffield and Palmerston–Hadspen No.1 and No.2 has the capability but readings cannot be transmitted through the SCADA systems to NOCS for display on the network operations control screens.
Co-ordinated project	This is not a co-ordinated project
Has the priority project been commenced ?	Yes
Date of priority project completion	Dec-16
Limit(s) addressed by priority project	Critical transmission lines are installed with fault location capability that will minimise transmission cirucit restoration times during a fault
Initial limit value(s)	Existing relays installed on critical transmission circuits
Target limit value(s)	Install realys with fault location capability to minimise transmission circuit restoration times during a fault
Completion limit values	Reduced unplanned outage frequency due to lightning.
Estimated capital cost of priority project	$120,000
Estimated operating cost of priority project	$14,000
Capital expenditure to date	$1,000
Operating expenditure to date	$0
Priority project key milestones and dates	Key milestones for this project are: ● Internal approval process was complted in October 2015 ● Project concept design is completed in January 2016 ● Project is scheduled to be completed by August 2016
Priority project update/comments	Relays are resourced internally, therefeoer procurement lead time is not required under this project

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Priority project name and ranking	19 Chapel Street Substation 110 kV bus coupler
Priority project description	Chapel Street Substation has an outdoor AIS 110 kV switchyard which has a double 110 kV bus arrangement. The two buses are connected via a single bus coupler circuit breaker. Failure of this circuit breaker to open under a fault event would result in all transmission circuits connected to both 110 kV buses being tripped. Installation of a second bus coupler or a bypass arrangement would prevent circuit interruption to seven 110 kV transmission circuits and four 110/11 kV supply transformers being tripped
Co-ordinated project	This is not a co-ordinated project
Has the priority project been commenced ?	No
Date of priority project completion	Dec-19
Limit(s) addressed by priority project	No interruption of supply caused by failure of a single 110 kV bus coupler circuit breaker to transmission circuits connected at 110 kV bus at Chapel Street Substation
Initial limit value(s)	Existing single 110 kV bus coupler arrangement
Target limit value(s)	Installation of a second bus coupler or bypass arrangement to minimise circuit restoration times during 110 kV bus coupler circuit breaker failure at Chapel Street Substation
Completion limit values	No interruption of supply caused by failure of a single 110 kV bus coupler circuit breaker
Estimated capital cost of priority project	$450,000
Estimated operating cost of priority project	$0
Capital expenditure to date	$0
Operating expenditure to date	$0
Priority project key milestones and dates	Key milestones for this project are : ● Internal approval is targeted by November 2017 considering 12 months lead time required to procure primary equipment ● Detail design to be completed by June 2018 ● Procurement of equipment to be completed by December 2018 ● Operational completion is targeted by December 2019
Priority project update/comments	

Name and ranking of priority project to be removed	9. Sheffield-Devonport transmission circuit
Priority project description	A number of transmission circuit spans may have substandard ground clearances. Through minimal investment, rectification of these spans will achieve compliance, and is also likely to result in an increase in line rating and capability.
Limit addressed by priority project	Identification of substandard clearances enable to achieve compliance requirement with an incremental transmission transfer capacity.
Initial limit value	Existing transmission line design temperature.
Target limit value	Increased transmission line design temperature. Quantification of the increase is not possible to predict until LIDAR surveys are complete.
Reasons to undertake the project	Suspected substandard clearances of transmission sections
Reason for priority project removal	TasNetworks has consulted with AEMO to remove this project from the priority project list and has proposed a similar replacement project for Liapootah-Waddamana 220 kV and Waddamana-Tungatinah 110 kV transmission corridors. The proposed replacement project is more critical in nature and addresses environmental and safety risks. A detailed survey identified that initially suspected substandard clearances on this transmission circuit are not as severe as initially suspected and only required ground profiling works in one or two sections. TasNetworks considers works to rectify substandard clearances on this transmission circuit is minimal and does not require a specific project to address issues associated with it. This project is no longer necessary to be included as a priority project under NCIPAP.

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Name and ranking of priority project to be removed	16. Savage River 110 kV transmission spur
Priority project description	A number of transmission circuit spans may have substandard ground clearances. Through minimal investment, rectification of these spans will achieve compliance, and is also likely to result in an increase in line rating and capability.
Limit addressed by priority project	Identification of substandard clearances enable to achieve compliance requirement with an incremental transmission transfer capacity.
Initial limit value	Existing transmission line design temperature.
Target limit value	Increased transmission line design temperature. Quantification of the increase is not possible to predict until LIDAR surveys are complete.
Reasons to undertake the project	Suspected substandard clearances of transmission sections
Reason for priority project removal	TasNetworks has consulted with AEMO to remove this project from the priority project list and has proposed a similar replacement project for Liapootah-Waddamana 220 kV and Waddamana-Tungatinah 110 kV transmission corridors. The proposed replacement project is more critical in nature and addresses environmental and safety risks. A detailed survey identified that initially suspected substandard clearances on this transmission circuit are not as severe as initially suspected and only required ground profiling works in one or two sections. TasNetworks considers works to rectify substandard clearances on this transmission circuit is minimal and does not require a specific project to address issues associated with it. This project is no longer necessary to be included as a priority project under NCIPAP.

Name of replacement priority project 1	9. Substandard clearances and rectification of transmission lines
Replacement priority project ranking	9
Transmission circuit/injection point(s)	Waddamana–Liapootah No.1 220 kV transmission circuit (TL 502) Waddamana–Tungatinah 110 kV transmission circuit (North, TL 425) Waddamana–Tungatinah 110 kV transmission circuit (South, TL 426)
Limit and reason for the limit	Transmission circuit TL502 between Waddamana and Liapootah is designed to operate at 90 degree Celsius. Transmission circuits TL425 and TL426 between Waddamana and Tungatinah are designed to operate at 49 degrees Celsius. A recent light detection and Ranging (LiDAR) survey undertaken by TasNetworks identified that a number of sections of transmission circuits TL502, TL425 and TL426 have substandard ground clearances that will significantly constrain the flow during summer months as existing under clearances will only allow these circuits to operate as high as 21 degrees Celsius conductor temperature for TL425, 10 degrees Celsius conductor temperature for TL 426 and 21 degrees Celsius conductor temperature for TL502. These substandard clearances also present a safety and environmental risks. Primary reason to include the replacement projects are: • to increase transmission capacity by rectifying substandard clearances; • to reduce TasNetworks safety and environment risks (bush fire); • to meet transmission line clearance compliance; and • to re-establish transmission circuit operateability to its design temperature.
Project description	Rectify identified substandard clearance on: TL 502:Waddamana–Liapootah No.1 220 kV transmission circuit TL425:Waddamana–Tungatinah 110 kV transmission circuit (North) TL426:Waddamana–Tungatinah 110 kV transmission circuit (South)
Initial limit	Existing transmission line design temperature
Improvement target	Restore transmission circuit operability to its design temperature
Estimated capital cost	$1,560,000
Estimated operating cost	$0
Consultation with AEMO	TasNetworks has consulted with AEMO and received endorsement in accordance with clause 5.4(e)**,** (g) prior to inclusion of this as a replacement project.
Reason to include the replacement priority project	TasNetworks has removed two substandard clearance of transmission line projects from the AER's approved project priority list after consultation with AEMO. A detailed survey identified that initially suspected substandard clearances on Sheffield-Devonport and Savage River Spur transmission circuits were not as severe as initially suspected and rectification will only require ground profiling in one or two sections. A recent LIDAR survey on Waddamana-Liapootah and Waddamana-Tungatinah transmission corridors identified that a number of substandard clearance sections present more severe environmental and safety risks. These two transmission corridors are more critical and may constrain transmission flow between Waddamana-Liapootah and Waddamana-Tungatinah especially during summer months if issues are not addressed. TasNetworks considers this amendment of the NCIPAP during the current regulatory period to be consistent with the requirement of clause 6A.7.4 and the objectives of the STPIS. The proposed replacement project will not result in TasNetworks exceeding 1 per cent of its proposed MAR for the regulatory control period, and is of a similar size to the project which it replaces.