

Mervyn Davies' Enquiry: Power and Water's Second Progress Report

Summary

September 2009

Overview

In September and October 2008, failures at Casuarina zone substation resulted in power outages to Darwin's Northern suburbs.

Following this, the Northern Territory Government commissioned independent expert Mervyn Davies to investigate what led to these failures.

Power and Water worked with Mr Davies extensively to prepare his report and has embraced his recommendations to compliment ongoing efforts to build the security of services into the future.

The Corporation had earlier developed the Asset Management Capability Project, and almost immediately established the Remedial Asset Management Program (RAMP).

RAMP was charged with ensuring safe access to substations, carrying out remedial works and replacing the Casuarina Zone Substation 11kV switchboard.

The Long Term Action Plan (LTAP) ensures Power and Water has embedded the changes recommended in the Mervyn Davies Report and is increasingly well-placed to meet the Northern Territory's growing and changing needs.

Power and Water's first progress report, released in June this year, outlined the operational and organisational changes adopted as a result of Mr Davies' enquiry.

Since then, the Corporation has taken a number of further steps to increase its capacity to provide reliable power to the growing Territory population.

At Casuarina Zone Substation, two temporary switchboards are in place so the permanent switchboard can be decommissioned and rebuilt.

The new permanent switchboard is scheduled for installation and commissioning in early 2010. Preparing for this has taken time as all associated infrastructure has been tested, reinforced and repaired where necessary to minimise the risk of disruption to customers and give crews a safe working environment.

Over the past three months Power and Water has continued inspecting, testing and repairing its other zone substations. As a result, need for maintenance work has been identified and taken place at a number of sites.

By the end of the 2008 - 2009 financial year, Power and Water had invested more than \$1m in training for its power networks staff and employed another six people in this field.

Staff have been trained to use infra red and thermal equipment to identify sooner when equipment is at risk of failure and are now prioritising future maintenance and replacement programs.

This testing has helped the RAMP team to revise their maintenance schedule. It has identified a number of sites requiring work but staff do anticipate completing work as scheduled by the end of 2010.

Power and Water's plans in response to the Mervyn Davies Report are realistic but do require continued investment and diligence. There is a lot of work to do and we are committed to meeting the milestones specified in the reports in the coming year.

Restoring Casuarina

Mervyn Davies' Preliminary Report recommended that the entire 11kV switchboard be replaced and Power and Water is expecting to complete this in the first quarter of 2010.

Since the first progress report, a second temporary switchboard has been built adjacent to the old substation building and new circuit breaker equipment installed in that switchboard.

Once the zone substation is running off two temporary boards, the old 11kV Casuarina switchroom can be removed from service and replaced. The installation plan is designed to minimise the risk of customer outages and ensure staff safety.

The following actions remain:

- decommission the existing switchboard;
- build a new switchboard on the site of the demolished switchboard;
- install vacuum circuit breakers in the new switchboard;
- commission the new switchboard;
- decommission temporary switchboards; and
- restore substation to normal operation.

It is then intended to replace and refurbish 66kV/11kV Transformer 1 at Casuarina.

Substation assessment

The Mervyn Davies Report initiated an assessment of all Power and Water substations, which is complete. In the early stages of investigation about half the assets required some maintenance before being returned to service, this quarter several sites have required substantial refurbishment.

The RAMP team has revised their works timetable to carry out this high priority work and anticipates completing all condition testing and remedial maintenance work on higher risk equipment by the end of 2010.

This quarter, Power and Water has completed works at:

- West Bennett 11kV switching station
- Humpty Doo 66/22kV zone substation
- Tindal 22/11kV zone substation
- Tennant Creek 22kV zone substation
- Wood Street 11kV zone substation (indoor only)
- Lovegrove 22/11kV zone substation
- Cox Peninsular centre Yard 66/11kV Section
- Mott Street 11kV zone substation

Meeting major milestones

- Milestone 1:** The completion of the initial risk assessment recommended by the Davies' Enquiry Preliminary Report to be noted by the Board by February 2009. **COMPLETE**
- Milestone 2:** The approval of the Remedial Works Plan by the Managing Director by April 2009. **COMPLETE**
- Milestone 3:** The completion of roughly a third of the Remedial Works Plan, and the consequent formal review of progress and lessons learnt, by July 2009. **COMPLETE**
- Milestone 4:** The clearance of each substation as scheduled, following testing and remediation as required, with all substations cleared by September 2010. **ON TRACK**
- Milestone 5:** The General Manager RAMP to approve a final Project Execution Plan and detailed installation plan by the end of June 2009. **COMPLETE**
- Milestone 6:** The General Manager RAMP to accept the new switchboard for service during the fourth quarter of 2009.
- Milestone 7:** The General Manager RAMP to accept the new transformer for service during the third quarter of 2010.

Recommendation 1 – Move to condition-based maintenance

Power and Water is shifting to condition-based maintenance, training in and using a wider variety of testing methods before taking equipment out of service for maintenance.

- Milestone 8:** The first draft Power Networks 2010-11 Five Year Business Plan and 20 Year Outlook maintenance forecasts to include a summary of planned maintenance as well as costs, based on a 'condition based maintenance' approach by August 2009. **COMPLETE**

Recommendation 2 – Implement condition-based maintenance in substations as quickly as possible

- Milestone 9:** Source external assistance from another utility to aid with maintenance training and support by February 2009. **COMPLETE**
- Milestone 10:** Complete agreements with workforce to ensure that Job Model and Remuneration arrangements support 'condition based maintenance' by June 2010.

Recommendation 3 – Bed down organisational changes

Power Networks is in the process of appointing experienced advisors to positions that have either been vacant or been held on a temporary basis. This is enabling further recommendations from the Davies Report to be implemented.

- Milestone 11:** Appoint the Manager Strategy and Planning and the Manager Capital and Maintenance Delivery by May 2009. **COMPLETE**

Milestone 12: Confirm appointment of new trades positions by May 2009. **COMPLETE**

Milestone 13: Appoint the next level of management by July 2009 (noting that this level of management would be unaffected by Recommendation 3.2). **PROGRESSING**

Recommendation 4 – Deliver improved systems and processes

The now established Asset Management Capability project will help every unit within Power and Water identify, prioritise and conduct maintenance.

Milestone 15: Identify process owners and ensure they have sufficient time to contribute to the AMC project by May 2009. **COMPLETE**

Milestone 16: Confirm that the Future State Design does, in fact, address the requirements of Recommendation 4.2 by December 2009.

Milestone 17: Confirm that the AMC as implemented does, in fact, address the requirements of Recommendation 4.2 by December 2010.

Recommendation 5 – Enhance policies and policy documentation

Power and Water's substation maintenance policies are being updated to reflect the condition-based maintenance approach.

Milestone 18: A revised Maintenance Policy based on 'condition based maintenance' will be approved by the GM-PN by August 2009. **FINAL DRAFT CIRCULATING**

Milestone 19: A review of high priority maintenance procedures, including detailed consultation with the workforce, resulting in a revised set of maintenance policies will be completed by September 2009. **PROGRESSING**

Milestone 20: A review of high priority work instructions, including detailed consultation with the workforce, will result in a revised set of maintenance policies by June 2010.

Recommendation 6 – Develop substation maintenance planning and works program

Maintenance policy and procedures are being developed, a works program will follow.

Milestone 21: Set high-level and detailed quantum plans for substation maintenance for 2010 and the following five years by December 2009.

Recommendation 7 – Report on maintenance delivery, asset condition, risks and failures

Power and Water will:

Milestone 22: Provide example maintenance delivery and asset condition report to the Board for five asset classes by February. **COMPLETE**

- Milestone 23:** Provide full maintenance delivery and asset condition reporting to the Board by August 2009. **COMPLETE**
- Milestone 24:** Appoint a Training Manager to the RAMP program with strong technical knowledge by May 2009. **COMPLETE**
- Milestone 25:** Appoint a Training Manager in Power Networks with strong technical knowledge by June 2009. **COMPLETE**
- Milestone 26:** Coordinators' development needs will be confirmed during the My Plan Performance review by July 2009. **ONGOING** - as the management restructure is finalised, development needs for each coordinator will be identified.
- Milestone 27:** Improved supervisory training will be provided to all coordinators from November 2009.
- Milestone 28:** A revised framework for trades and technical training will be approved by October 2010.
- Milestone 29:** Commence first steps in Leadership Development by May 2009. **COMPLETE**
- Milestone 30:** Individual development plans will be formulated for each manager, which align with and contribute to their current performance development plans by July 2009. **COMPLETE**
- Milestone 31:** Suitable external leadership development opportunities will be assigned to each person by August 2009. **ONGOING**
- Milestone 32:** Development courses will commence by September 2009. **COMMENCED**
- Milestone 33:** All relevant managers receiving at least one session of development by December 2009.
- Milestone 34:** Complete RISQ Investigation 1768 by April 2009. **COMPLETE**
- Milestone 35:** Commence ameliorative action in light of Manton investigation, and further information on Yorkshire switchboards by July 2009. **COMPLETE.**
- RAMP investigations are complete and the recommendation is to replace all Yorkshire switchboards. Power and Water has four Yorkshire switchboards, which will be replaced with more modern technology as priority dictates.
- Milestone 36:** Review incident management procedures and approve resulting Work Instruction by August 2009. **PROGRESSING**
- Milestone 37:** Complete investigation into Casuarina events on access to the old switchboard by September 2009. This will take place when the board is removed from Casuarina in the final quarter of 2009.

What it means for customers

Power and Water has ramped up its maintenance schedule, which means more equipment than usual has been and will be taken out of service for testing and repair. Every protection measure is in place but as we progress this project, there is an increased risk of customer outages.

We have committed to:

- Avoid outages for our customers whenever possible.
- Where a planned outage is unavoidable, notify affected customers using letterbox leaflets, newspaper or radio advertising at least seven days in advance.
- Where maintenance activity increases the risk that equipment cannot be returned to service within a reasonable period, we will make arrangements to limit the impact on customers. Week night and weekend work will reduce the need for planned outages during weekdays.

Long term, reliability will improve

In the longer term, customers will benefit from a more reliable electricity supply. With reliable switchgear outages are less likely and - when they occur - they affect customers for a shorter time.

The emphasis on:

- education for trades people, technicians, supervisors and the management team;
- a streamlined maintenance cycle;
- increased accountability of maintenance activities;
- improvements in maintenance documentation;
- increased resources to perform the work; and
- specific requirements for reporting maintenance performance to the Board and executive management,

will ensure that maintenance practices, in line with established industry asset management practices, are kept up to date and plant failures minimised.

The costs of these improvements will be far outweighed by the community benefits of a more secure and reliable electricity supply.

Glossary

AMC	Asset Management Capability
CAIDI	Customer Average Interruption Duration Index (a measure of reliability)
CB	Circuit breaker
CT	Current transformer
DAR	Defective Apparatus Record
EMC	Executive Management Committee
FIS	Facilities Information System
HV	High voltage
LTAP	Long Term Action Plan
MMS	Maintenance Management System
OCB	Oil circuit breaker
PEP	Project Execution Plan
RAMP	Remedial Asset Management Program
RISQ	Risk, Investigation, Safety and Quality – Power and Water’s hazard investigation database, among other things
RWP	Remedial Works Plan
SAIDI	System Average Interruption Duration Index (a measure of reliability)
SAIFI	Customer Average Interruption Frequency Index (a measure of reliability)
SCADA	System Control and Data Acquisition
VT	Voltage transformer
WIMS	Works Implementation Management System