



Mervyn Davies' Enquiry: Power and Water's Final Report

June 2011

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1 Executive Summary

In September and October 2008 a number of electrical equipment failures at Casuarina Zone Substation resulted in widespread power disruption to Darwin's northern suburbs. Consequently, the Northern Territory Government established an independent inquiry headed by Mervyn Davies to investigate these events as well as Power and Water Corporation's operational response and electrical substation maintenance practices in Darwin.

The principal recommendations were that the Corporation should:

- Implement condition-based maintenance in substations as quickly as possible by acquiring information, support and clarifying accountabilities;
- Bed-down organisational changes;
- Deliver improved systems and processes, including supporting policies and policy documentation;
- Develop substation maintenance planning and works program;
- Report on maintenance delivery, asset condition, risks and failures;
- Enhance workforce capability, training, numbers and equipment;
- Review incident management and investigations, and complete some outstanding investigations; and
- Undertake an overall remedial program, including taking immediate action to replace the Casuarina Zone Substation 11kV switchboard.

The Davies Report's Recommendations can be seen in full on the Corporation's website at powerwater.com.au/powersupplyupdate.

It is now over two years since the Davies Report was finalised, and the Corporation has been working systematically to implement these recommendations and improve network reliability.

During this time, all substation condition assessment and appropriate remediation actions have been completed on all electrical assets.

In conjunction with the Asset Management Group, the identification of ongoing maintenance works in line with other Australian utilities has been developed and implemented.

Ongoing works now form part of the five year Asset Maintenance Plan.

This is the eighth and final report detailing progress and achievements against the 37 major milestones to fulfil Davies Report's recommendations.

2 Achievements

The key achievements made by the Corporation in fulfilling the Davies Report's recommendations have been:

- Improved analysis technology which identified conditions previously unknown. This allowed specific remediation work to be carried out on tested assets; and
- Significant improvements in technical training, raising skills within the Corporation's workforce.

2.1 Overview

The Remedial Works Plan successfully progressed in line with the Davies Report's recommendations and timelines:

- Condition-based maintenance was carried out on all zone substation assets where appropriate (this is now part of the five-year Asset Maintenance Plan);
- Training has been completed on new test gear and technically expert training managers have been appointed (this has significantly raised the technical skills of the workforce);
- A wide-ranging restructure of the Power Networks' business has continued and key roles have been filled (which will lead to more efficient use of resources);
- A leadership program and regular staff forums continue to improve collaboration with the workforce (which will significantly improve internal communications);
- A condition assessment and remedial program was completed in February 2011; and
- The Casuarina Zone Substation (CASZZ) upgrade was completed in March 2011.

2.2 Progress in the past quarter

In the past quarter, progress has continued as outlined below:

- The Casuarina Zone Substation has been fully restored, commissioned and returned to service, including the replacement of the 11kV switchboard, redevelopment of the substation building, and returning the entire substation to normal operation;
- Remediation work was completed on the 66kV and 22kV oil filled assets at Palmerston Zone Substation; and
- The City Zone Substation 66kV has been remediated.

3 Overall milestone progress

The following table summarises progress made on the Davies Report Recommendations. As the scope of each task has been carefully assessed and analysed, Power and Water has revised some of the initial milestone dates.

It has been possible to bring some target dates forward, however it has also been recognised that some original target dates could not be met due to the much larger scope of work required. These latter dates have been amended and reported against.

Milestone	Initial target date	Revised target date	Status
1 Completion of the initial risk assessment recommended by the Mervyn Davies Preliminary Report to be noted by the Board.	Feb 2009		Complete
2 Approval of the Remedial Works Plan by the Managing Director.	Apr 2009		Complete
3 Completion of roughly a third of the Remedial Works Plan and the consequent formal review of progress and lessons learnt.	Jul 2009		Complete
4 Clearance of each substation as scheduled, following testing and remediation as required. Improved testing techniques have uncovered worse asset conditions than anticipated. This has added to RAMP's scope of works.	Sep 2010		Completed in Feb 2011
5 General Manager Remedial Asset Management Program to approve a final Project Execution Plan and detailed installation plan.	Jun 2009		Complete
6 General Manager Remedial Asset Management Program to accept the new Casuarina switchboard for service.	Dec 2009		Complete
7 General Manager Remedial Asset Management Program to accept the new transformer for service.	Third quarter 2010		Complete ¹
Recommendation 1 – Move to condition-based maintenance			
8 The first draft of Power Networks Five-Year Business Plan and 20-Year Outlook maintenance forecasts include a summary of planned maintenance as well as costs based on a condition-based maintenance approach.	Aug 2009		Complete
Recommendation 2 – Implement condition-based maintenance in substations			
9 Source external assistance from another utility to aid with maintenance training and support.	Feb 2009		Complete
10 Complete agreements with workforce to ensure that Job Model and Remuneration arrangements support condition-based maintenance.	Jun 2010		Complete ²
Recommendation 3 – Bed down organisational changes			
11 Appoint the Manager Strategy and Planning and the Manager Capital and Maintenance Delivery.	May 2009		Complete
12 Confirm appointment of new trades positions.	Jul 2009		Complete

Milestone	Initial target date	Revised target date	Status
13 Appoint the next level of management.	Jul 2009		Complete
14 Managing Director to approve a revised organisational structure for Power Networks.	Jul 2009		Complete
Recommendation 4 – Deliver improved systems and processes			
15 Identify process owners and ensure they have sufficient time to contribute to the AMC Project.	May 2009		Complete
16 Confirm that the Future State Design under the AMC Project does, in fact, address the requirements of Recommendation 4.2.	Dec 2009		Complete
17 Confirm that the AMC Project as implemented does, in fact, address the requirements of Recommendation 4.2.	Dec 2010		On track, and will be confirmed once Maximo has been implemented in late 2011.
Recommendation 5 – Enhance policies and policy documentation			
18 A revised Maintenance Policy based on 'condition-based maintenance' will be approved by the General Manager Power Networks.	Aug 2009		Complete
19 A review of high priority maintenance procedures, including detailed consultation with the workforce, resulting in a revised set of maintenance policies to be completed.	Sep 2009		Complete
20 A review of high priority work instructions, including detailed consultation with the workforce, will result in a revised set of maintenance policies.	Jun 2010		Complete
Recommendation 6 – Develop substation maintenance planning and works program			
21 Set high-level and detailed five-year quantum plans for substation maintenance.	Dec 2009		Complete
Recommendation 7 – Report on maintenance delivery, asset condition, risks and failures			
22 Provide example maintenance delivery and asset condition report to the Board for five asset classes.	Feb 2009		Complete
23 Provide full maintenance delivery and asset condition reporting to the Board.	Aug 2009		Complete
Recommendation 8 – Enhance workforce capability			
24 Appoint a Training Manager to Remedial Asset Management Program with strong technical knowledge.	May 2009		Complete
25 Appoint a Training Manager in Power Networks with strong technical knowledge.	Jun 2009		Complete
26 Confirm coordinators' development needs during the MyPlan Performance Review.	Jul 2009		Complete
Recommendation 9 – Implement a staff development program			
27 Improved supervisory training will be provided to all coordinators.	Nov 2009		Ongoing, as identified in MyPlans.

Milestone	Initial target date	Revised target date	Status
28 Approve a revised framework for trades and technical training.	Oct 2010		Ongoing ³
29 Commence first steps in Leadership Development.	May 2009		Complete
30 Individual development plans will be formulated for each manager, which align with and contribute to their current performance development plans.	Jul 2009		Complete
31 Suitable external leadership development opportunities will be assigned to each person.	Jul 2009		This has commenced and is proceeding on schedule.
32 Commence development courses.	Aug 2009		Complete
33 All relevant managers receiving at least one session of development.	Dec 2009		Complete
Recommendation 10 – Review incident management and investigations			
34 Complete RISQ Investigation 1768.	Apr 2009		Complete
35 Commence ameliorative action in light of Manton investigation and further information on Yorkshire switchboards. The replacement of the switchboard in Alice Springs has been fast tracked, the Katherine board replacement is nearing completion and work is underway on the Batchelor substation which will benefit the Manton Switchboard.	Jul 2009		On track ⁴
36 Review incident management procedures and approve resulting Work Instruction.	Aug 2009		Complete
37 Complete investigation into Casuarina events on access to the old switchboard.	Sep 2009		Complete

- 1 A new spare transformer has been accepted into the system and the original transformer has been refurbished and tested and will be returned to service in August 2011.
- 2 A new Collective Bargaining Agreement has been agreed, in which a number of job working groups have been established. One of these addresses this issue.
- 3 While significant training has been undertaken, a final framework and schedule cannot be finalised until the job models are complete and all maintenance is scheduled to allow resource allocations.
- 4 The Katherine Board has been replaced and will be commissioned in August 2011. The Manton Board is scheduled to be replaced in 2011-2012. A separate Business Case is being prepared to replace the 22kV Board at the Sadadeen Zone Substation.

4 Summary

The outstanding recommendations of the Mervyn Davies Report relate to improving Power and Water's maintenance operations in the longer term. Power and Water has prepared a Long Term Action Plan to ensure these recommendations are diligently implemented and to provide clear direction for its leaders and workforce.

The Long Term Action Plan covers:

- The maintenance cycle and move towards condition-based maintenance (complete);
- Accountability and organisational structural changes (complete);
- Documentation of policy, procedures, and work instructions (on-going);
- Reporting of maintenance activity and asset condition (occurs on a monthly basis);
- Training and development of Power Networks staff (complete); and
- Incorporating improvements into the Power Networks Business Plan (ongoing and as required).

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

The emphasis on the longer-term improvements 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.

This is the eighth and final report against the Davies Report. It has been audited by an external consultant, and their report is attached. This reporting will be replaced by annual reviews against long term targets.

Glossary

AMC	Asset Management Capability
CAIDI	Customer Average Interruption Duration Index (a measure of reliability)
CASZZ	Casuarina Zone Substation
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

28th June 2011

Dr Keith Beven
General Manager
Remedial Asset Management Program
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Dear Keith

Second Review of Report Entitled "Mervyn Davies Report 8th and Final Edition May/June 2011"

AECOM was commissioned by Power and Water Corporation (PWC) in May 2009 to track the progress of PWC's implementation of the recommendations of the Mervyn Davies' Inquiry. The initial commission was for a period of several months. This has subsequently been extended through until the end of June 2011.

The methodology employed by AECOM to track progress includes face-to-face interviews with key PWC managers followed by sighting of evidence to support claims. Major updates are completed in person at the Ben Hammond Complex prior to PWC's Board meetings. Alternate (minor) updates are conducted via a series of telephone interviews. The progress towards and completion of all significant milestones is tracked and an earned value methodology used to calculate the overall progress of both the Long Term Action Plan (LTAP) and Remedial Asset Management Program (RAMP).

On behalf of AECOM, the undersigned has provided nineteen progress reports to PWC senior management since May 2009.

It must be emphasised that AECOM's commission is only to track the progress of the actions that PWC has committed to undertake. AECOM's commission is not to comment on the appropriateness or effectiveness of these actions.

PWC has recently extended AECOM's commission to include a review of PWC's eighth and final progress report on the response to the Mervyn Davies' Inquiry. The intent of this review is to provide independent confirmation that the information contained in PWC's final quarterly progress report is consistent with progress data gathered by AECOM during the previous twelve months.

A draft copy of the report entitled "*Mervyn Davies Report 8th and Final edition May/June 2011*" was reviewed by AECOM in mid June 2011. AECOM provided a number of comments to clarify between ongoing and completed tasks along with some of the dates contained within the draft report. Subsequently, an updated version of this report – "*Amended - Mervyn Davies 8th and Final Edition June 2011*" – was reviewed. All of AECOM's comments have been addressed by PWC in the final version of the report.

AECOM hereby confirms that to the best of its knowledge and belief, the report entitled "*Amended - Mervyn Davies 8th and Final Edition June 2011*" dated June 2011 accurately describes the progress of the actions that PWC has committed to undertake in response to the Mervyn Davies' Inquiry.

Any queries in relation to AECOM's review should be addressed to the undersigned.

Yours faithfully



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Encl: Amended - Mervyn Davies 8th and Final Edition June 2011_CD Markup.DOC