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**Review of Transpower's
Capital Expenditure Plans
(Asset Replacement, Refurbishment and
Enhancement Information Technology)**

For: The Commerce Commission

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Preface



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Glossary of Terms

COBIT	Control Objectives for Information and related Technology
EA	Enterprise Architecture
EGR	Electricity Governance Rules
GPS	Government Policy Statement
ICT	Information & Communications Technology
ISSP	Information Systems Strategic Plan
ITIL	Information Technology Infrastructure Library
KPI	Key Performance Indicator
MSP	Market Systems Programme
NPV	Net Present Value
ODV	Optimised Deprival Value
PAD	Project Approval Document
PMO	Project Management Office
RTU	Remote Terminal Unit
SCI	Statement of Corporate Intent
TNSP	Transmission Network Service Provider
TPSLC	Transpower Solution Life Cycle
SCADA EMS.	System Control & Data Acquisition - Energy Management Systems

Capital Expenditure Definitions

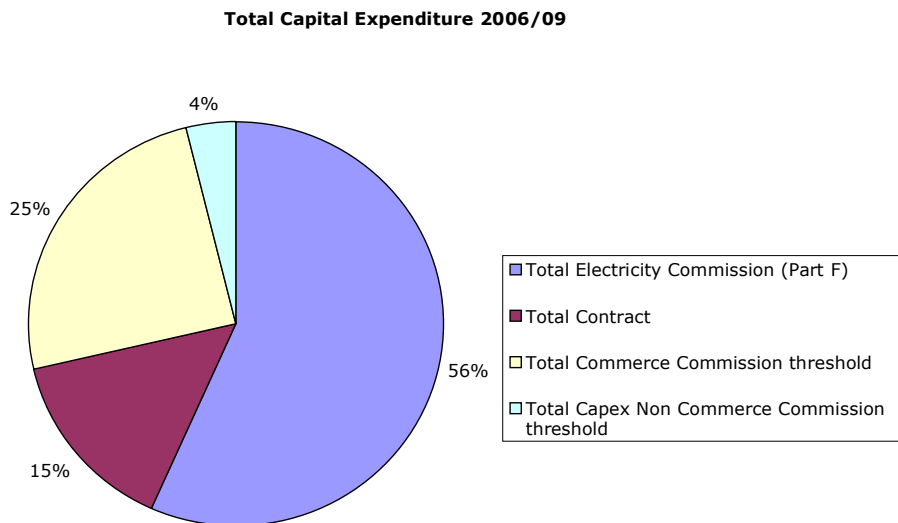
Transpower defines capital expenditure in the following areas:

- Refurbishment:** expenditure on an asset, or sub-component that *materially* extends its original economic life but does not improve its original service potential
- Replacement:** replacement of an asset where this does not *materially* improve its original service potential.
- Enhancement (non Part F):** This category of expenditure is not well defined at present but in general these are enhancement and development projects involving existing or new assets which are intended to: bring performance to a level of good industry practice; ensure compliance with statutory or Electricity Governance Rules requirements; correct historical design or construction issues; or, to provide physical protection of assets. Practical financial limits are applied by Transpower so that assets below \$1.0 - \$1.5m and programmes of work below \$5.0m are not submitted to the Electricity Commission for approval under Part F.
- Telecommunications:** capital expenditure relating to the upgrade and replacement of the telecommunications network used for operating the grid
- SCADA EMS:** capital expenditure relating to the upgrade and replacement of the application System Control & Data Acquisition / Energy Management Systems (SCADA EMS) used for operating the grid
- SCAD RTU Protocol:** capital expenditure relating to the upgrade and replacement of the Remote Terminal Units (RTU) and other station devices used for providing data to SCADA and other grid-operating applications
- Network Systems R&R:** capital expenditure relating to the maintenance of components such as RTU's, and the replacement and refurbishment of systems used in support of operating the grid, such as asset management systems

Executive Summary

The purpose of this study is to review Transpower's plans for capital expenditure on replacement, refurbishment, enhancement and development¹, and Information Technology for 2006/07 and the following two years. We have been asked to provide advice to the Commission on the reasonableness of the plans and associated forecast capital expenditure. The study excludes expenditure requiring approval under Part F of the Electricity Governance Rules (EGR)² or capital expenditure that is required for Transpower to perform its obligations under the System Operator Service Provider contract³.

Transpower's budgeted total capital expenditure for the three year period 2006 to 2009 is shown in the chart below. It can be seen that, whilst Part F makes up the largest proportion of Transpower's budgeted capital expenditure, 44% of the total capital expenditure spend falls outside the Electricity Commission approval process.



The approach taken has been to review the policies, processes and practices of Transpower with respect to capital expenditure on asset replacement, refurbishment and enhancement and Information Technology and to consider their appropriateness

¹ This is enhancement and development capital expenditure that is not submitted by Transpower to the Electricity Commission for approval under Part F of the EGRs and is therefore intended to fall within the Commerce Commission Threshold.

² Electricity Commission approval for capital expenditure as provided under Part F of the Electricity Governance Rules and Regulations

³ Transpower performs the System Operator functions under a service provider contractual arrangement with the Electricity Commission.

and effectiveness in achieving the least-cost objective set out in the Government Policy Statement⁴ and in Transpower policy documents. In focussing on the least-cost objective Strata is not suggesting this should be achieved at the expense of meeting other objectives set out in the Government Policy Statement. A full technical review of individual projects has not been undertaken.

In our review of the asset replacement, refurbishment and enhancement capital expenditure we formed the view that, although the least-cost objective is clearly set out in policy documents, in practice Transpower is currently not fully achieving this objective and aspects of its current capital expenditure management processes could be improved. We reached these conclusions primarily on the basis of our views that:

- the internal challenge process with respect to achieving least-cost replacement, refurbishment and enhancement capital expenditure is relatively weak;
- the project tendering process is not particularly competitive and creates a situation which may encourage tenderers to act in an anti-competitive manner;
- Transpower's focus on achieving the least-cost objective is not sufficiently strong;
- Transpower takes a cautious approach to capital expenditure as a result of the high importance attached to ensuring the security of supply. This is entirely appropriate given the importance of a reliable electricity supply. However, the strong bias towards security brings a risk of over-spending and going beyond the requirements of the Grid Reliability Standards⁵; and
- the accuracy of project cost data is in question, particularly the correct categorisation of capital expenditure and the accuracy of cost estimates.

We note however that Transpower's recently promulgated *Rules for Procurement* policy will improve the management of refurbishment, replacement and enhancement capital expenditure over time, provided the policy is closely observed.

Our research led to the conclusion regarding IT capital expenditure that, while there is room for improvement, a number of factors combine to provide an environment favourable to Transpower achieving the objective of least-cost capital expenditure on IT. These factors include:

- strong strategic and governance framework;
- focused and well integrated approach to initiating and evaluating projects which arose out of the restructuring and realignment processes commenced in 2003/04
- disciplined, standardised project management processes, which again arose from the restructuring and realignment processes;
- good internal challenge processes;
- the requirement to obtain a firm price before a Business Case can be submitted for approval; and

⁴ Government Policy Statement on Electricity Governance October 2006

⁵ Grid Reliability Standards determined by the Electricity Commission under section III of part F of the Electricity Governance Rules 2003

- the new *Rules for Procurement* policy which in time will improve the management of IT capital expenditure, provided the policy is closely observed

Overall our view is that Transpower's performance in achieving its least-cost objective could be improved if Transpower were to implement a range of measures and changes in approach including:

Common areas of potential improvement

- raising the focus throughout Transpower on achieving the least-cost objective;
- setting capital expenditure cost reduction targets (at least for repeat replacement, refurbishment and enhancement capital expenditure);
- taking steps to ensure the close observance of the recently introduced *Rules for Procurement* corporate policy;
- introducing provisions into process and policy documentation requiring that, throughout the process of initiating, evaluating and implementing projects, the achievement of least-cost capital expenditure objective is explicitly considered and that the steps being taken (or intended to be taken) to achieve it are set out; and
- requiring that supporting and approving signatories to documentation approving capital expenditure satisfy themselves that all reasonable steps to achieve least-cost capital expenditure have been taken.

Asset replacement, refurbishment and enhancement expenditure specific improvements

- instituting a more rigorous challenge process with respect to project costs;
- better monitoring performance with regard to managing replacement, refurbishment and enhancement capital expenditure and in achieving the least-cost objective;
- establishing an open-book process of negotiating project costs under longer-term alliancing agreements; and
- improving the accuracy of the cost-estimation process.

IT expenditure specific improvements

- better monitoring, measurement and performance management of capital expenditure on IT (including comparing cost estimates with actual costs and developing better KPI/Balanced Scorecard measures); and
- further investigation of the opportunities to utilise certain contracting practices (open-book, outcomes-based and alliancing) to deliver, not only the required project outcomes, but also least-cost capital expenditure.

Establishing capital expenditure thresholds

We consider it would be appropriate, if using Transpower's budgeted and forecast capital expenditure as a basis to establish thresholds for capital expenditure, for each of the three years to be adjusted downwards. In determining the extent of the adjustment appropriate to each year, the following factors should be taken into account:

For asset replacement, refurbishment and enhancement expenditure

- in our view, it should be possible for Transpower to achieve a minimum reduction through efficiency gains of 5% within 18 months i.e. by the middle of the 2008/2009 financial year. This is a subjective view based on the gains we would expect to be achieved if Transpower were to implement best practice measures not presently applied. It is difficult to quantify precisely the achievable reduction in capital expenditure levels because the focus of the study has been on the appropriateness of policies, processes and practices rather than on reviewing individual projects (which time would not permit). In our view, some reduction is clearly justified and, in an endeavour to under-adjust rather than over-adjust, we have taken the approach of estimating the minimum reduction possible. We consider this a conservative adjustment and expect that greater gains are possible if Transpower was to implement measures focussed on achieving least-cost capital expenditure. It should be noted that Transpower has provided comment that a 5% reduction in tower painting costs should be achievable through contracting over a longer term
- Transpower has recently provided updated data for replacement, refurbishment and enhancement capital expenditure which reflects an increase in the total value of projects over three years by \$20m. This, together with a reallocation between the years, has resulted in Year Three increasing by more than 50% from \$61m to \$92m. As a consequence of the scale of the changes in Year Three (2008/09) Strata does not consider it appropriate for the data to be used as a basis for establishing a threshold without a detailed reconciliation and investigation into the changes to identify the extent to which the figures require adjustment
- Transpower has advised that, while replacement, refurbishment and enhancement projects are sometimes approved on a basis which includes contingencies, such contingencies are excluded from budgeted and forecast capital expenditure. Consequently no adjustment for contingencies is required. If they had been included it would be appropriate to reduce contingencies down to a minimal level because, in Strata's view, the threshold should exclude contingencies so as to reflect the actual expected level of expenditure.

On this basis, a downward adjustment of 5% in each of the three years would be appropriate. This should be applied to inflation- adjusted figures in the second and third years.

For IT expenditure

- the expenditure thresholds relate to actual costs and not to cost estimates which include contingencies, i.e. the threshold amount is expected to operate as an amount which actual expenditure may reach, but not exceed. Therefore, we consider the budgeted and forecast IT capital expenditure levels established by Transpower are not appropriate for consideration as a threshold but should be adjusted downwards because the data on which they are based includes contingency sums. The data from the 60 projects completed since 1

July 2006 indicates that IT Division, on average, does not use its contingencies at all and, in fact, comes in slightly under budget. We consider that a 12.5% downward adjustment to the budgeted expenditure, to adjust for the contingency component, would be appropriate when setting thresholds. This level of adjustment reflects the fact that contingencies and reserves usually represent a total loading of 20% on top of the base cost.

- if Transpower does take further steps to improve its performance to reduce capital expenditure these will take time to implement and derive a benefit. There is some prospect of impacting the 07/08 year but the full impact of the any measures taken is unlikely to be felt until mid 2008/2009; and
- in our view, it should be possible for Transpower to achieve a minimum reduction of 2.5% through efficiency gains within 18 months, i.e. by the middle of the 2008/2009 financial year. This is a subjective view based on the gains we would expect to be achieved if Transpower were to implement best practice measures not presently applied. It is difficult to precisely quantify the achievable reduction in capital expenditure levels because the focus of the study has been on the appropriateness of policies, processes and practices rather than on reviewing individual projects (which time would not permit). However, in our view, some reduction is justified. In an endeavour to under, rather than over-adjust the proposed levels, we have taken the approach of estimating the minimum reduction possible.

On this basis, a downward adjustment of 15.0% (i.e. 12.5% adjustment for contingency plus 2.5% adjustment for potential efficiency gains) from the budgeted expenditure in each of the three years would be appropriate in establishing thresholds. This should be applied to inflation- adjusted figures in the second and third years. We note that an overall downward adjustment of 15% would result in a thresholds for each year equivalent to the forecast base cost of projects plus a contingency of 2%. This is calculated on the basis the proposed adjustment is applied to the entire budgeted and forecast expenditure, including the contingency sums.

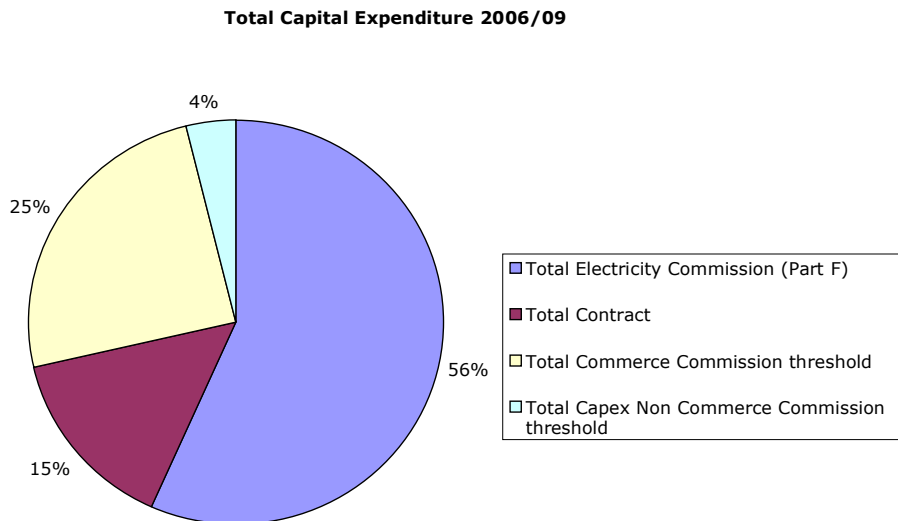
In summary, we conclude that for asset replacement and refurbishment expenditure, the budgeted and forecast capital expenditure figures overstate appropriate threshold levels by 5%, and possibly more, and accordingly should be adjusted downwards. Whilst we consider Transpower can improve its performance in achieving the least-cost objective, we record our strong impression that Transpower performs a creditable and professional job in relation to the other facets of managing and implementing replacement and refurbishment capital expenditure.

With regards to IT expenditure, we conclude that the budgeted and forecast expenditure levels would not be appropriate to use as thresholds as they are overstated by 15%, and possibly more, and accordingly should be adjusted downwards for the purposes of establishing thresholds.

1. Introduction & scope

The purpose of this study is to review Transpower's plans for asset replacement, refurbishment, enhancement and development⁶, and Information Technology (IT) capital expenditure and to provide advice to the Commission on the reasonableness of these plans and associated forecast capital expenditure. The study excludes capital expenditure that Transpower submits to the Electricity Commission for approval under Part F of the Electricity Governance Rules (EGR)⁷ or capital expenditure required in relation to the System Operator Service Provider contract between Transpower and the Electricity Commission⁸.

Transpower's budgeted total capital expenditure for the three year period 2006 to 2009 is shown in the chart below. It can be seen that, whilst Part F makes up the largest proportion of Transpower's budgeted capital expenditure, 44% of the total capital expenditure spend falls outside the Electricity Commission approval process.



The 'Total Contract' component at 15% of total capital expenditure relates to the bilateral new investment contracts that Transpower holds with its customers. The 4% value for 'Capex Non Commerce Commission Threshold' is for IT business support and minor fixed assets.

A full breakdown of Transpower's total three year Capital Expenditure budget is provided in the table below:

⁶ This is enhancement and development capital expenditure that is not submitted by Transpower to the Electricity Commission for approval under Part F of the EGRs and is therefore intended to fall within the Commerce Commission threshold.

⁷ Electricity Commission approval for capital expenditure as provided under Part F of the Electricity Governance Rules and Regulations

⁸ Transpower perform the System Operator functions under a service provider contractual arrangement with the Electricity Commission.

Transpower's total capital expenditure 2006 to 2009

Transpower Capital Expenditure			
\$ millions	2006/07 Budget	2007/08 Forecast	2008/09 Forecast
Electricity Commission (Part F)			
- North Island Upgrade	35	95	128
- Other projects approved	54	56	5
- Not yet approved / pending	43	96	177
Total Electricity Commission (Part F)	132	247	310
Contract			
- Customer investments	47	53	79
Total Contract	47	53	79
Commerce Commission Threshold			
- Asset replacement	26	32	33
- Asset refurbishment	8	10	12
- Asset enhancement (non Part F)	17	19	16
Total grid asset related expenditure	51	61	61
- IT Network communications (capital)	11	46	23
- IT SCADA EMS & RTU	12	3	3
- IT Network Systems: development & replacement	6	8	8
Total IT related expenditure	29	57	34
- Capitalised operating lease costs	*	*	*
Total Commerce Commission Threshold	80	118	95
Non Commerce Commission Threshold			
- IT Business support & Minor Fixed Assets	14	20	12
Total Capex Non Commerce Commission Threshold	14	20	12
Total Capital Expenditure	273	438	496

Note these figures are not adjusted for inflation and capitalised operating lease costs are not included.

Transpower has proposed some draft terms to form part of an Administrative Settlement to the Commerce Commission. In its terms, Transpower has proposed a settlement where the above budgeted and forecast capital expenditure (Commerce Commission Threshold) for replacement, refurbishment and enhancement and IT capital expenditure would be used as the basis to establish thresholds. Transpower intends that these figures would be updated subject to final amendment at the time settlement arrangements are finalised.

We have been asked to provide an opinion on the reasonableness of the above proposed levels of capital expenditure on asset replacement, refurbishment and enhancement and on IT for the three years 2006/07, 2007/08, 2008/09. In preparing the advice we have:

- reviewed the proposed and historical expenditure and trends;
- considered the underlying assumptions for reasonableness;
- examined the appropriateness of processes and policies, and conducted sample testing of adherence to these policies; and
- examined a selection of relevant internal business cases and other project documentation.

1.1 Limitations

Because the time frame was limited, a top-down approach has been applied to the investigation through a focus on whether appropriate policies and processes have been created and applied. This contrasts with the alternative approach of examining a sample of individual projects to establish whether, in those instances, the capital expenditure was reasonable or not and then extrapolating from those findings.

In our review of IT expenditure, focus has been placed on the two major projects (the SCADA EMS and Telecommunication upgrades). However, we have not conducted a technical review or attempted to determine whether alternative, appropriate solutions were available at lower cost. The approach has been to determine whether the policies and processes which have been applied, are likely to have delivered a least-cost solution. The same approach has been taken with the review of capital expenditure on asset replacement, refurbishment and enhancement.

1.2 Key assumptions

Our analysis is based on data and documentation provided by Transpower and on discussions with Transpower management and staff.

1.3 Report structure

This report contains two main sections:

- Asset replacement, refurbishment and enhancement review
- IT expenditure review

Whilst each section contains many common areas, the structure of each is different and, for clarity of reading, requires separate sections.

Section 1: Asset Replacement, Refurbishment & Enhancement Capital Expenditure

2. Background

In order to meet its obligations to transmission customers and to comply with the relevant legislation, standards and EGR, Transpower undertakes investments in and maintains its assets and systems. A major proportion of this expenditure is subject to approval from the Electricity Commission under Part F of the EGR.

In addition to capital expenditure subject to testing under Part F, Transpower undertakes smaller and more routine investment and maintenance under its capital replacement, refurbishment and enhancement and development programmes. Such expenditure is not currently scrutinised and approved by the Electricity Commission. Whilst still meeting its service obligations, Transpower is required to manage these programmes in a manner that ensures the services grid users and consumers want are delivered at least-cost.⁹

Transpower defines replacement, refurbishment and enhancement capital expenditure as follows:

refurbishment: expenditure on an asset, or sub-component, that *materially* extends its original economic life but does not improve its original service potential

replacement: replacement of an asset where this does not *materially* improve its original service potential.

enhancement (non Part F): This category of expenditure is not well defined at present but in general these are enhancement and development projects involving existing or new assets which are intended to: bring performance to a level of good industry practice; ensure compliance with statutory or Electricity Governance Rules requirements; correct historical design or construction issues; or, to provide physical protection of assets. Practical financial limits are applied by Transpower so that assets below \$1.0 - \$1.5m and programmes of work below \$5.0m are not submitted to the Electricity Commission for approval under Part F.

The assessment of Transpower's achievement of least-cost management of capital expenditure on replacement, refurbishment and enhancement is the subject of this report.

3. Approach taken

The study was undertaken as a desk-top exercise at a relatively high level. The focus was on business processes and management rather than a technical review of individual projects. The following aspects were considered:

⁹ GPS on Electricity Governance October 2006 paragraph 80 (page 20)

3.1 Policy, principles and objectives

Transpower's policies that govern and provide guidelines for its asset management planning and implementation were identified and reviewed. The principles on which the policies are based were identified together with relevant objectives that have been set. The review considered the appropriateness of the policies and any omissions that would be reasonable for Transpower to have included.

3.2 Procedures processes & practice

A review was undertaken of Transpower's procedures and processes and their application by Transpower in implementing and managing the replacement, refurbishment and enhancement of grid assets. This included consideration of the approach taken by Transpower in developing its asset management plans, its maintenance practices and philosophy for specific groups of assets and its commercial arrangements with contractors. The review considered the contribution these procedures and processes make to ensuring capital expenditure is reasonable and least-cost.

3.3 Measurement and performance

Transpower's approach to measurement and reporting of its asset management performance including benchmarking and past performance was reviewed. The review included an investigation of whether the benefits of past experience are captured in asset management planning. Key issues and variable components that are expected to impact on Transpower's asset management over the next 3 years were established and the underlying assumptions reviewed. Consideration was also given to expected trends in capital expenditure over time.

3.4 Best practice

In addition to the above analysis, a view was taken on which key policies and practices would best ensure replacement, refurbishment and enhancement expenditure was reasonable and least-cost. This was then compared with Transpower's actual policies and practices to gauge the extent to which these matched and any gaps were identified.

4. Policy principles & objectives

4.1 Government Policy Statement on Electricity Governance

The Government Policy Statement on Electricity Governance (GPS) issued in October 2006 provides (at Para 80) that among the objectives for the provision of transmission services:

“the efficiency of transmission services should be continuously improved so as to produce the services grid users and consumers want at least cost”.

It should be noted that, while the primary focus of this report is on the extent to which the least-cost objective is being achieved, Strata does not suggest this should be at the expense of achieving the other objectives set out in the GPS. These include grid

reliability, diversity of supply to larger load centres and the facilitation of competition.

4.2 Statement of Corporate Intent

Transpower's 2006-2007 Statement of Corporate Intent (SCI) includes objectives to:

- promote efficient investment in the National Grid to provide the platform for a competitive wholesale market thus enabling options for investment in generation and demand-side management;
- seek to efficiently recover the full costs of its services;
- improve the efficiency of its services, whilst optimising asset reliability and availability;
- be as profitable and efficient as comparable businesses not owned by the Crown; and
- seek to provide transmission services at the standard of quality and security agreed with National Grid users or required by regulatory agencies.

4.3 Comprehensive Plan for Asset Management and Operation of the Grid

The Comprehensive Plan for Asset Management and Operation of the Grid (PAM) produced in September 2005 sets out the policies and procedures applied (among other things) to capital expenditure on replacement, refurbishment and enhancement. It sets out the cost minimisation objective and the broad means by which it is to be achieved.

It notes at 5.1 Planning Objective that

“The objective of Transpower asset management planning is to maintain service quality and quantity obligations in a least-cost way by managing existing and new grid assets reliably, safely and economically.”

Further it states at 5.2.1 Cost Minimisation and Benchmarking

“Cost minimisation is achieved through developing and implementing asset management policies that set the framework for efficient capital and maintenance expenditure. Benchmarking is also used to establish the effectiveness of cost minimisation and evaluate present practices internationally, while emulating, where appropriate, the practices and policies of the “best performers.”

It is further noted at 5.2.3 Grid Asset Maintenance that

“Most repair work, replacement, refurbishment and enhancement proceed only after economic analysis to determine the most cost-effective solution.”

and

“Asset plans are developed on an individual detailed cost/benefit analysis or a cost-benefit analysis applied to the asset policy, before sign-off and implementation. Cost-benefit analysis is based on the whole-of-life cost,

which includes future maintenance costs, outage costs, risks of failure and potential penalties.”

Under the heading ‘Asset Condition and Maintenance Report’ the PAM sets out Transpower’s approach to asset management for each category of asset.

The PAM also notes that Transpower has:

- a predictive maintenance model;
- long-term plans for each site;
- internal Key Performance Indicators (KPI) to monitor capital efficiency and maintenance efficiency;
- data on asset condition assessments, maintenance, best practices and the environment assets operate in; and
- taken into account future plans for grid development.

Comment

The GPS, SCI and PAM clearly articulate the requirement that capital expenditure (including replacement, refurbishment and enhancement capital expenditure) is used as efficiently as possible and is carried out on a least-cost basis. In the case of the PAM it broadly sets out the means by which this is to be achieved.

4.4 Business Plan 2006/07 (October 2006)

The Business Plan 2006/07 (October 2006) (Business Plan) repeats the cost management and efficiency objectives set out in the 2006-2007 Statement of Corporate Intent (see above). It also refers in *Appendix 1: Efficient Performance* to the use of benchmarking to:

“...monitor cost and service trends and highlight areas of potential cost anomaly or cost outliers, which may require further scrutiny.”

The Appendix refers to three benchmarking exercises:

- the comparison with the operating expenditure of Australian Transmission Network Service Providers (TNSP). However, this study explicitly excludes depreciation charges and therefore does not provide data relevant to capital expenditure on replacement, refurbishment and enhancement;
- the International Transmission Operations & Maintenance Study (ITOMS) primarily considers both performance levels and costs for transmission line and substation maintenance. Over the past two years the ITOMS study has trialled the inclusion of [replacement and refurbishment capital expenditure for some categories of equipment](#). However Transpower has advised the process is not mature, the divisions of capital expenditure are not clear and not all participants provide separate data. As a result Transpower has not been able to utilise it for benchmarking purposes
- the Group of International Comparison of Transmission System Operation Practice (GICTSO) functions primarily to exchange information among over

20 members on current and future transmission operating practices. However, the focus is on long-term planning, scheduling and despatch and it does not provide data which can be used to benchmark capital expenditure.

The Business Plan also has a number of Key Performance Indicators relating to financial, operational, EGR compliance and health and safety performance. The Business Plan refers (at Page 7) to Key Performance Indicators being used to achieve Transpower's Objectives, including actual performance in delivering value to both shareholders and customers. However, the only measure relating to replacement, refurbishment and enhancement capital expenditure is the Capital Spend KPI. Under this KPI Transpower is to deliver approved projects within budget without exceeding Board approved capital spend for the year.

Comment

We accept, as noted in the Appendix to the Business Plan, there are limitations on the use of benchmarking data because of operational and jurisdictional differences and factors such as variation in the age of assets and the physical characteristics of the network. **However, over and above this, a more fundamental limitation in respect of replacement, refurbishment and enhancement capital expenditure is that Transpower simply does not have data against which it can benchmark its performance in managing such capital expenditure.**

Transpower states in the PAM that it uses benchmarking to establish the effectiveness of capital expenditure cost minimisation. In our view, based on the information provided, Transpower cannot assert this in relation to replacement, refurbishment and enhancement capital expenditure as it does not have the relevant data with which it can benchmark its performance. It is important that benchmarking is not assumed to be an effective safeguard guaranteeing the least-cost objective is met.

The capital spend KPI relates to managing capital expenditure within an overall dollar limit and therefore is a very simple broad measure of the total expenditure on capital investment. **Any least-cost inefficiencies will already be embedded in the KPI figure and therefore achieving the KPI figure will not necessarily mean all capital expenditure has been on a least-cost basis.** The KPI will only be effective in ensuring the least-cost objective is achieved to the extent the underlying policies and processes are effective. **The KPI will not significantly incentivise Transpower to ensure the least-cost objective is achieved.**

We would have expected a greater linkage between the least-cost objective and the KPI's.

4.5 Asset specific policies

Transpower also has specific policy documents which deal with capital expenditure in major asset categories. These set out the basis on which a decision is made as to whether and when to refurbish or replace a particular asset type. Criteria include (in addition to safety, whether fit for task, reliability, the availability of spares and the age of the technology) the costs of and options for maintaining, refurbishing and replacing the asset. In some instances, specific reference is made to a Net Present Value (NPV)

cost benefit analysis, and the inputs and parameters for the calculations have obviously been given some considerable thought.

Comment

These policies generally require that the costs of the available options for a particular project are compared. While some policies do refer to cost-benefit analyses, not all do. However, **it is important to be aware that simply identifying all available options and performing a cost-benefit analysis does not necessarily ensure least-cost capital expenditure. Such analysis is only as good as the quality of the input data.**

Unless procedures and processes are in place to ensure the costs for each option being compared are all least-cost, then the exercise can easily become a comparison of one high cost option with a range of others. It is important not to assume that performing cost-benefit analyses is an adequate safeguard which ensures least-cost capital expenditure without also ensuring the quality of the input data.

The overall impression of the policies sighted is that, whilst project costs are certainly considered, achieving the least-cost objective is not a core focus.

5. Procedures processes & practice

5.1 Policy development & review procedure

Transpower policy documents are controlled documents which are subject to registration and version control. The requirements for the content and the procedure for developing such documents is set out in the Guidelines for Transpower Controlled Document Development (October 2005). Policy documents are generally required to explain the reasons for the policy, identify any linkages to high-level over-arching policy documents (such as the SCI) and define the process by which the policy is to be given effect.

It was not apparent from the policies sighted that these had been reviewed, despite most being published in the period 2001-2003. Transpower has however confirmed that all policies have been reviewed even though they have not been reissued where the only change is to the review date.

Comment

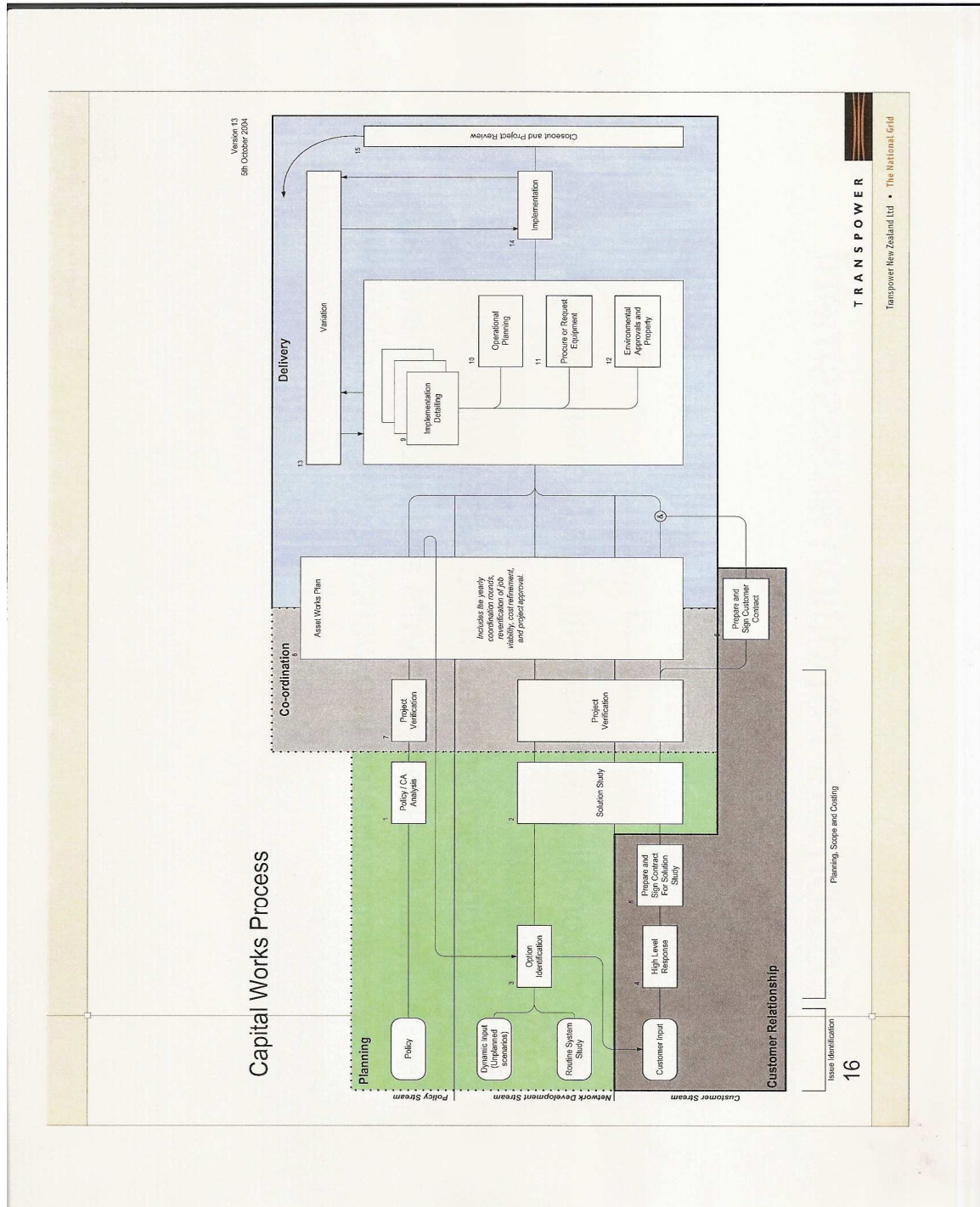
To show the policy had been reviewed and to indicate the next review date it would be good practice to issue an updated cover sheet following a review even if the content of the policy had not changed.

5.2 Asset management planning process

The Capital Works Procedures Manual (23 November 2004) details the way Transpower plans, designs, obtains contracts and consents, and spends capital to build assets. The Asset Works Plan step is central to the overall operation of the Capital Works Process. Within this step, the coordination and optimisation of works for the

various streams is carried out with the objective of ensuring efficiency and practicality issues are resolved. Works are streamed within Network Development, Customer and Policy streams.

The following Capital Works Process diagram, taken from "Capital Investment - Replacement & Refurbishment Expenditure" dated 28 November 2006, sets out the process.



The Asset Management Database (AMDB) is loaded with capital expenditure projects across a three year timeframe. This more focused time horizon is intended to best provide for the detailed coordination and availability of resources within Transpower and contractors for the various functions (engineering, planning, environmental, field services, grid economics, grid planning, project managers, inventory and procurement, finance, etc) to coordinate their roles.

A key driver in the scheduling of replacement, refurbishment and enhancement capital expenditure is the condition assessment process. The condition of a range of different asset types is monitored and data relating to factors which impact on asset life and serviceability are captured. This information is used as a basis to determine the optimal timing of replacement, refurbishment and enhancement and, in conjunction with data on the costs of the available options, is also used to determine which option best meets requirements. The focus is on replacing and refurbishing assets when the condition requires rather than at a particular point in the life of a particular asset.

Projects are entered into the AMDB on the basis of a High Level Response (HLR) document or a Project Verification Document (PVD) which set out details of the project, including the estimated cost. These require authorisation from an appropriate level of delegated authority. When entered, project costs are generally based on standard ODV costs which, in the case of lines assets, are then varied in accordance with factors which the ODV method does not take into account. Transpower advises that project cost estimates do not generally contain contingency sums to allow for cost overruns and unforeseen costs. However at the HLR and PVD stage cost estimates are only considered to be accurate to plus or minus 30%.

Closer to the commencement of the financial year, the costs for projects occurring in that year are refined as part of the process of obtaining approval for the capital expenditure under a Project Approval Document (PAD). Transpower's target position, as at 1 July, is for 80% of the works in AMDB which are due to occur during that year to be the subject of a PAD approval.

At this stage contingencies are not generally included except on a case by case basis where there is a significant degree of uncertainty over costs. In these instances Transpower may include a contingency sum of up to 10% of the base cost. Transpower has advised that in the current financial year and two subsequent years only 188 out of 1445 projects have a contingency. In total, contingencies represent approximately 2% of the total forecast capital expenditure for the period.

Although some projects are approved inclusive of contingencies Transpower advises that all contingency sums are excluded from budgeted and forecast replacement, refurbishment and enhancement capital expenditure costs. This contrasts with IT capital expenditure, where contingencies included in project approvals are taken through to budgeted and forecast costs.

Transpower has advised that in preparation for a PAD, a consultant is generally engaged to provide an estimate of the total cost. As part of this process, the consultant may discuss project costs with potential contractors. Transpower may then vary the consultant's estimate, based on its own experience in similar circumstances. Transpower has a costing model for Stations which is now substantially complete and is working towards finalising a model for Lines by June-July 2007. However, estimated project costs are not based on actual tenders and, as Transpower has

acknowledged in discussions, a degree of uncertainty remains regarding final project costs, even at the PAD stage.

Transpower has acknowledged that in the past, the project cost estimation process was far from ideal, particularly at the HLR and PVD stages. The level of focus on the accuracy of cost estimates was not high, particularly if the project did not involve long lead times for equipment ordering.

Transpower has advised that in 2005, it began to strengthen its focus on the accuracy of its cost estimation processes. However, it is not possible to gauge the effect of this until more of the projects move through to completion and commissioning to provide the data for an assessment. What is apparent from the comparison of PAD estimates with actual project costs (see 6.2 *Project Cost Changes* below) is that the historical level of accuracy has been low, even at the later PAD budget approval stage.

A sample of the actual costs and the original PAD / business case approved figure for 8 large recently completed projects was obtained. The sample was restricted to this size because Transpower did not have the consolidated information and the collection of this data would have required the separate investigation of each project file. After excluding two projects (which were not appropriate indicators of change) the 6 remaining projects showed an increase of 65% of actual costs over the initial budget approved. We note that Transpower has advised these projects were initiated in 2002/2003 when cost estimation processes were less effective than is now the case.

In the course of our research, we were advised by Transpower management that, in some instances, contractors are required to initiate projects under the terms of a contract and then are responsible for carrying out the works. We understood from this information that Transpower is generally provided with evidence by the contractor, of the basis on which it determined the works were required. However, we understood that Transpower does not audit this evidence or the decisions to initiate works, even on a periodic basis. Subsequently Transpower has advised that there is a challenge to works initiated, however, we have not had the opportunity to view evidence that would confirm this is correct.

We were provided with a copy of a Performance Improvement Project relating to the optimal strategy for the management of galvanised steel transmission towers. This carefully analysed the relevant factors and developed detailed asset management strategies which took cost-containment into account. This was published in October 1999. We understand that several similar studies have subsequently been undertaken.

Comment

The discussions and analysis referred to above indicate a significant degree of uncertainty regarding the accuracy of the cost estimation process at the HLR, PVD and PAD stages. This is particularly so at the HLR/PVD stage where cost estimates are regarded as being accurate to within plus or minus 30%. Transpower has advised that since 2005 it has worked to significantly improve cost estimation processes, but as noted above it is too early to establish whether this has been effective. Transpower itself has acknowledged that the task of improving cost estimation processes still has some way to go. Our view is that, for the immediate future, estimated project costs will continue to vary significantly from actual costs.

Strata considers the exclusion of contingency sums from budgeted and forecast capital expenditure to be unusual, particularly as the larger projects will have been approved at Board level. This treatment is also inconsistent with capital expenditure on IT whereby contingency sums (generally 20%) are taken through to the budgets and forecasts. Furthermore IT project approvals can only be obtained once costs have been determined by tender or a similar process. In contrast replacement, refurbishment and enhancement expenditure is very much less certain and yet contingencies are not taken through to the budgeted and forecast costs.

In our view, Transpower senior management and the proposers of the PAD are motivated to ensure, with a significant degree of certainty, that the approved capital expenditure for each particular project is sufficient to complete the project. This is because a requirement for a subsequent approval for an increase in project cost is inconvenient and may cause delay. More importantly, project cost increases must be approved at a level higher than the original approval, frequently requiring Board approval. Such increases are likely to be the subject of scrutiny, including questioning about the reason for the initial under-estimation of project costs.

We do not suggest that if costs for a particular project are over-estimated it will automatically follow that the actual costs will be at the same level. However, we consider that a degree of pressure to over-estimate project costs (rather than underestimate them) creates an environment which is potentially conducive to accepting higher costs than necessary. In our view, this pressure is somewhat inconsistent with the least-cost objective and is not adequately countered at present.

While the emphasis on the security of supply is understandable and appropriate it gives rise to a risk of over-spending on replacement, refurbishment and enhancement capital expenditure. Without appropriate controls, checks and balances, this could lead to over-engineered solutions which exceed the requirements of the grid reliability standards¹⁰. We consider Transpower's condition assessment process goes some way to providing this check.

A significant potential conflict of interest arises where contractors have contractual responsibility for identifying when replacement, refurbishment and enhancement works are required. Given these contractors are also responsible for then performing the work, they are highly incentivised to initiate works. Particularly stringent controls, checks and balances are required given the conflict of interest. **Whilst we note that Transpower has advised that a challenge does occur on works initiated, we would have expected, at a minimum, that periodic audits on contractor initiated works would be regularly undertaken to confirm the need for the projects.**

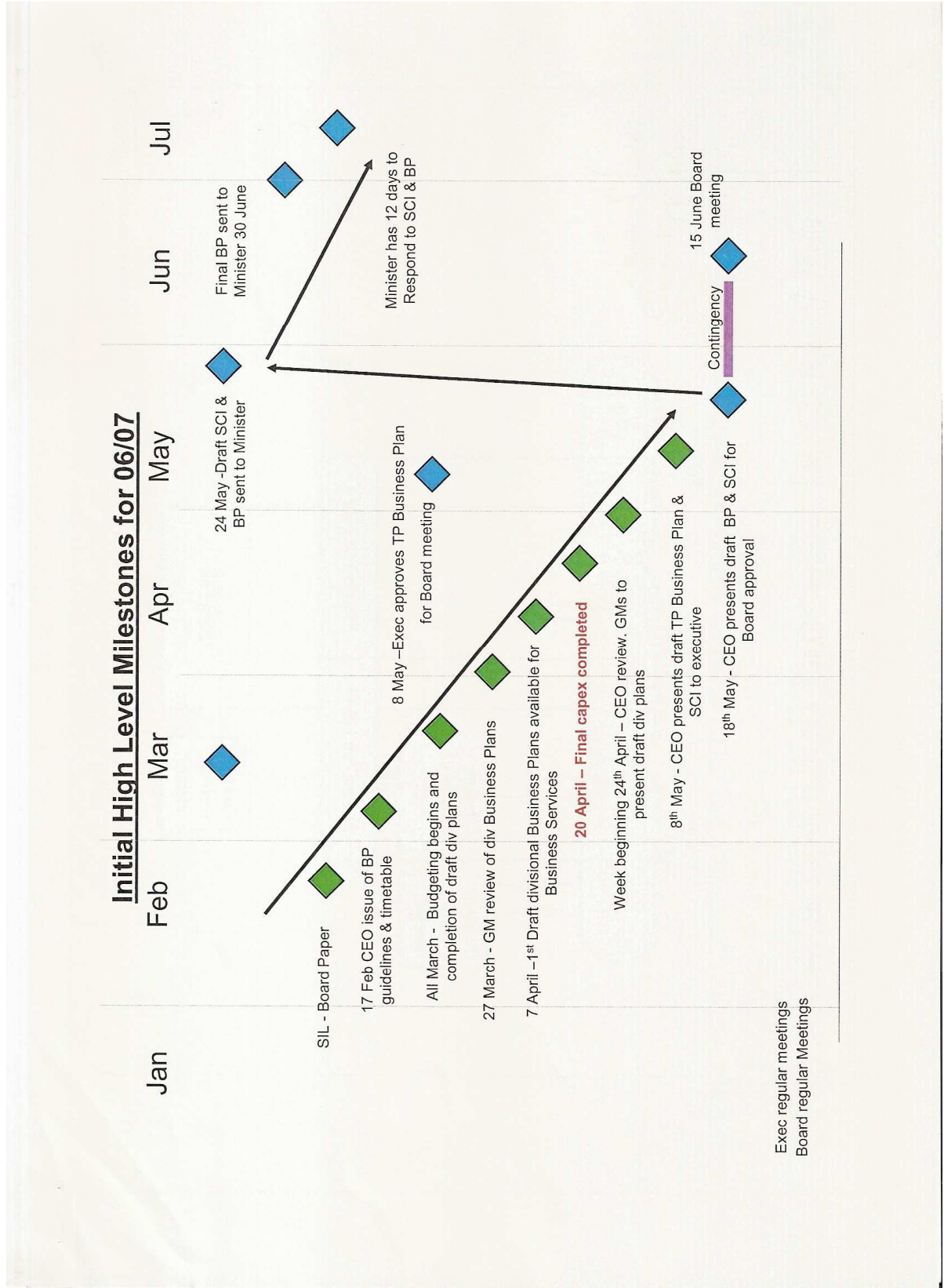
5.3 Business planning process

The asset management planning process of constantly updating project data dovetails into the preparation of the Business Plan. Policy stream reviews take place in the September quarter and full review meetings of all streams in October. Then in March/April, the asset management planning process provides final inputs into the

¹⁰ Grid reliability standards determined by the Electricity Commission under section III of part F of the Electricity Governance Rules 2003

overall Transpower Business Plan, and capital expenditure for the following financial year is then fixed.

The following figure is taken from the Transpower PowerPoint document "Capital Investment - Replacement & Refurbishment Expenditure" dated 28 November 2006. It shows the progress of the annual business planning process for the 06/07 year which commences with a budgeting process through which each division produces its own business plan. These are consolidated into an overall business plan which is finally put to the Board.



Comment

As discussed above at 4.4 Business Plan 2006/07 (October 2006) we consider the Capital Spend KPI has little effect on ensuring the least-cost objective is achieved. We would have expected to see closer linkages between KPI's in the Business Plan and the least-cost objective or at least for appropriate KPI's to be in place at the Divisional level.

5.4 Challenge and review processes

The challenge process begins with meetings held in September of each year to review the 10 year Asset Works Plan (AWP), with a primary focus on years 1-3. Field Services guidelines for the meeting indicates that the purpose of the review is primarily to

“gain enough information to approve all projects in the coming year before the AWP freeze”.

This is followed by the October Full Review Challenge Round attended by representatives of Engineering Services, Asset Development, Customer Services, Asset Planning, Environmental, Grid Economics and Grid Planning.

A further challenge process occurs at the time approval is sought under a PAD to incur the costs. We are not aware of any specific criteria being set down as part of the PAD process which requires that the approving authority must consider fully whether adequate steps have been taken to ensure the project will be carried out at least cost. The policy documents discussed above set out the least-cost objective, but we are not aware of any procedural requirement which ensures that this is fully considered as part of the PAD process.

Also, as discussed under 5.2 *Asset management planning process* above, the proposers of a PAD and Transpower senior management are (in Strata's view) motivated to ensure that there is sufficient headroom to minimise the risk of under-budgeting. This is because any approval for an increase has to be sought from a higher level than the original approval.

Comment

An adequate challenge process should include robust consideration of whether the least-cost objective is being achieved. However, the process diagram contained in the minutes of each set of Full Review minutes sighted indicates that the issues to be considered are environmental, system impact, asset redundancy and future grid requirements. There is no indication from the material sighted that any set of criteria regarding cost containment is being applied at these meetings or that any group attending has particular responsibility for ensuring this issue is addressed.

At the PAD stage, it appears there is no specific requirement on the approving authority to ensure the least-cost-objective is met. However, consideration is certainly given to cost, particularly in the context of determining which particular engineering solution is to be used. But, as discussed at 4.4 *Asset specific policies* above, simply requiring an NPV analysis of the available options will not guarantee the least-cost objective, including the most appropriate technical solution, is met. It is also necessary to ensure that the input data for each option is prepared on a least-cost basis.

Steps Transpower could take to ensure an adequate challenge process include: introducing provisions into process and policy documentation requiring that, throughout the process of initiating, evaluating and implementing projects, the achievement of least-cost capital expenditure objective is explicitly considered and that the steps being taken (or intended to be taken) to achieve it are set out; and, requiring that supporting and approving signatories to documentation approving capital expenditure satisfy themselves that all reasonable steps to achieve least-cost capital expenditure have been taken;

Our overall view is that the challenge and review process does not have a strong focus on achieving the least-cost objective. This view is supported by our analysis of the data at 6.2 *Project cost changes* regarding changes in project costs from PVD estimated cost through to the PAD cost to the actual completed cost. Our expectation was that the challenge process would result in overall costs reducing significantly as projects progressed through the HLR, PVD and PAD stages. In fact the examination of the historical data indicates overall costs increased by approximately 25% in the data analysed. We note that in 2005 Transpower took steps to improve the accuracy of its cost estimation processes and that any benefits from this may not yet be reflected in the data.

5.5 Electricity Commission approvals

Transpower has discretion regarding what capital expenditure it seeks approval from the Electricity Commission, under Part F and what is considered part of its capital expenditure on replacement, refurbishment and enhancement that falls within the threshold. We understand the only documentation regarding the process and criteria by which Transpower determines the capital expenditure for which it will seek EC approval is a one page, high level decision tree chart.

Where replacement capital expenditure includes an element of enhancement, the costs are apportioned on the basis of what the primary driver for the expenditure is. If it is enhancement, then the whole job is classified as enhancement irrespective of whether assets are being replaced, and the proposed expenditure is submitted to the Electricity Commission for approval. If the primary driver is replacement, but there is an element of enhancement, then Transpower may seek approval for the enhancement element from the Electricity Commission. If it does not approve this, then that component will need to be within the (proposed) Commerce Commission threshold.

In addition, there are some relatively small projects (below \$1- \$1.5 million) that are exclusively enhancement and development but are not submitted to the Electricity Commission for approval under Part F of the EGRs. Such expenditure is intended to be included within the proposed Commerce Commission threshold.

Comment

We would have expected to see the decision tree chart criteria to be expanded further in a supporting policy document.

It is beyond the scope of this report to consider the incentives on Transpower to classify capital expenditure as either requiring or not requiring Electricity

Commission approval, but we note there is some room for Transpower to exercise discretion in this.

5.6 Competitive tendering process

Transpower has advised that a key means by which it ensures project costs are genuinely least-cost is through a competitive tender process with its contractors. This outsourcing process is governed by procedures for tendering, the project management guide, contract support templates, project controller's handbook and business processes. These determine the content of the tender documents, the evaluation and award of contracts and drafting of a final contract.

Transpower has acknowledged that, because of the specialised nature of much of the work and market size limitations, there is often a small number of potential tenderers. In fact, in order to promote competition, Transpower has, in the recent past, accepted some tenders at above the lowest acceptable tender simply to retain the particular tenderer in the market.

Transpower has, in some instances, adopted an alliancing policy whereby it commits to certain expenditure with a particular provider over a three-year period. The effect of this is to give the provider the certainty of revenue over a longer period from which to recoup its investment in equipment and staff training.

Transpower expressed the view that, in the case of capital expenditure on tower painting, costs involving scoping, project management, training, Q.A., accommodation and travel and establishment could be reduced by 20% if contracting was over a longer term. This excludes materials, preparation and application which comprise 75% of tower painting costs. The overall reduction in tower painting costs would therefore be approximately 5%.

Comment

We consider that simply relying on a tender process is not sufficient to ensure truly competitive price pressure is achieved because of the limited number of potential contractors and significant barriers to entry of new providers (market size and specialised skill and equipment requirements).

This situation provides ideal conditions for contractors to share price-sensitive information with each other and engage in anti-competitive practices. Strata has no evidence of such behaviour, however we consider the opportunity certainly exists and the behaviour would be hard to detect.

In our view endeavouring to keep parties in the market is appropriate in these circumstances. However, paying a higher than market price is economically inefficient and may actually lead to upward price creep because the information may be shared.

We consider the alliancing concept has significant merit as it helps alleviate uncertainty for both parties. Contractors have significant uncertainty if contracts are short-term and will endeavour to price accordingly i.e., they will seek to recoup their investment in training and equipment over a shorter period. Transpower also has significant uncertainty over whether a pool of financially viable and well-resourced tenderers will be available to implement its asset management plan. The alliancing

structure, developed by Transpower, of making a longer term commitment goes some way to addressing both issues.

However, in our view, this process can do far more than just alleviate uncertainty.

The alliancing structure can also be used to more effectively ensure contracts are let at least-cost and to mitigate the risk of anti-competitive behaviour.

Transpower could require an open book tendering regime so that it can see, at the time the contract is negotiated, the cost of all project components and the return the contractor is expecting to receive. Given the significant amounts involved, and the benefits longer term commitments provide to contractors, it should not be difficult to persuade them to accept this basis which is relatively common in other industries.

Overall, Transpower does not appear to receive adequate consideration for the value it gives in providing contractors greater certainty through alliancing. In our view, an open book basis could be a standard feature of Transpower's alliancing process. Further consideration should also be given to expanding application of the alliancing process. We would expect such an approach to contribute to a reduction in capital expenditure costs. This view is supported by Transpower's conclusion that longer-term contracting would reduce overall tower painting costs by 5%.

Finally, we note our understanding that Transit NZ Ltd has made considerable cost savings by letting long-term contracts which focus on the achievement by the contractor of certain performance levels from the assets they are contractually responsible for. The contract is not about repairing x or replacing y but about ensuring the road meets certain performance criteria and is usable a certain percentage of the time. We suggest, if it has not already been considered, that this model may be worthy of investigation by Transpower.

6. Measurement & Performance

6.1 Replacement & refurbishment capital expenditure trends

Transpower have advised that the trend in replacement and refurbishment capital expenditure consists of an ongoing steady rise due to:

- rising labour (unit) costs;
- increased labour inputs due to increased health and safety compliance requirements;
- increased materials costs; and
- the impact of a significant 'bulge' in the age profile of its asset base, centred around the 40-50 year age group.

Replacement & Refurbishment Capital Expenditure FY04/05 to 08/09

	04/05	05/06	06/07	07/08	08/09
Under \$1.0m	28,405,317	30,894,944	25,247,865	27,807,543	34,705,589
Increment year on year under \$1.0m		9%	-18%	10%	25%
Over \$1.0m	1,943,230	6,250,188	8,370,831	13,174,026	5,744,807
Increment year on year over \$1.0m		222%	34%	57%	-56%
Replacement Portion of Enhancement				1,039,871	4,860,798
Total	30,348,547	37,145,132	33,618,696	42,021,440	45,311,194

The table above reflects actual capital expenditure for FY04/05 and 05/06 and budget for FY 06/07, 07/08, 08/09. It appears to show from FY06/07 onwards an accelerating upward trend in capital expenditure on replacement and refurbishment projects of less than \$1.0m. However, we note the FY04/05 and FY05/06 years were higher than FY06/07. Also we understand the past two years have been one of a heavy focus by Transpower on processes and delivery with the result that some projects were deferred. Varying views have been expressed by Transpower as to whether the deferred capital expenditure constitutes a yet to be crested 'bow wave' or whether it is now just an inconsequential 'ripple'.

We note the wide oscillation from year to year in the total value of projects over \$1.0m, as shown in the year on year increments in the table below. Transpower advise the level of variability is due to this category being made up largely of 'one-off' projects.

Since Strata began its review of Transpower's capital expenditure, significant adjustments have been made to Transpower's October 2006 Business Plan figures for FY 07/08 and 08/09 on account of recategorisations, project deferrals, new projects and the reclassification of a portion of enhancement expenditure to replacement.

Note that the analysis in the table below reflects the calculation of the sum of all changes, ignoring whether the figures are positive or negative, and then expresses them as a percentage of the original budget. This approach is necessary otherwise large equal and opposite changes would cancel each other out and understate the extent of the changes.

Adjustments to Transpower's October 2006 Business Plan			
	06/07	07/08	08/09
Recategorisations	3,972,197	12,795,968	13,418,385
Deferrals		-	11,823,333
New Projects		1,455,819	4,174,962
Replacement portion of enhancement		1,039,871	4,860,798
Total Adjustments	3,972,197	15,291,658	34,277,478
Original Budget	32,195,155	52,321,718	61,517,152
Total Adjustments as % of Original Budget	12.3%	29.2%	55.7%
Incorrect Categories (recategorisations and replacement portion of enhancement above)			
Total Incorrect Categories	3,972,197	13,835,839	18,279,183
Total Incorrect Categories as % of Original Budget	12.3%	26.4%	29.7%

In three months since the Business Plan was finalised, significant changes have been made to the budget numbers. As shown in the table above, total changes (recategorisations, deferrals, new projects) to the Business Plan since October 2006 represent 12%, 29% and 56% respectively in the current (06/07) year and in each subsequent year. In the current financial year, changes due to recategorisation alone

represent over 12%, 26% and 30% respectively of the refurbishment and replacement budget. We note that these recategorisations do not increase total capital expenditure.

Transpower advise that much of the change was occasioned by a review of the classification of expenditure. This was undertaken because of the greater significance now attaching to accurate categorisation because of the Electricity Commission's Part F approval process and the application of a Commerce Commission threshold.

Comment

The reasons provided by Transpower for the increase in capital expenditure over time are considered to be reasonable. It is very likely that labour and materials costs are increasing significantly. Also we have seen sufficient evidence to satisfy us that health and safety compliance costs and those arising from an ageing asset base are increasing.

As noted, Transpower has explained that the above changes have come about as a result of a review of the categorisation of expenditure. The implication is that now categorisation has taken on greater significance, it will be done more accurately from now on. This may well be the case, however, we note that Transpower has provided three different data series in the short time this review has been proceeding (see 6.3 below).

In our view, the extent of the changes to the Business Plan figures is surprising, particularly the 06/07 and 07/08 years which we would expect to have been relatively settled. At the very least this raises a question about the reliability of the data. In future, Transpower will need to demonstrate that its closer focus on the accuracy of categorisations will continue, and that this will be effective in minimising variability. For the present, a level of uncertainty remains.

6.2 Project cost changes

We have analysed how estimated project costs have changed for each project over time. As shown in the table below, replacement and refurbishment projects which were in the Business Plan in 04/05 have increased in estimated cost by approximately 25% in the 06/07 Business Plan. Those projects which entered first in 05/06 increased in 06/07 by 54% in the case of replacement capital expenditure and 9% for refurbishment. New projects of \$20.0m, which had not appeared in a previous Business Plan, arose in 06/07.

Project cost changes

	Replacement	Refurbishment
04/05 to 06/07 (% movement)	24.3%	26.2%
05/06 to 06/07 (% movement)	54.1%	9.4%
New Projects in 06/07 (\$)	19,145,130	882,651

Transpower has advised that a significant reason for the changes in cost of projects over time has been changes in project scope. However, of the \$16.2m in total changes advised by Transpower (both positive and negative), only \$3.6m (22%) were described as due to changes in scope, The primary single cause related to refining the estimate.

We have also reviewed a sample of changes between the estimated project cost at the PAD / business case stage and the actual completed project cost. In the sample, which consisted of six recent large projects, total actual costs of \$4.9m exceeded the initial PAD estimated cost by 65%. The final budget figures, which had been arrived at after a number of variations had been processed, exceeded the actual cost by 9%.

Comment

We would have expected that, as a result of the challenge and contracting processes, the overall value of a body of projects would steadily reduce as a projects moved from initial HLR and PVD estimates, through PAD approvals, to actual completion. Some projects would be reduced in scope while others would reduce in cost as a result of cost containment measures. The above figures indicate this has not been the case. This supports our view that the challenge process is not robust in relation to meeting the least-cost objective.

While the historical performance in reducing costs has not been optimal Transpower has advised that in 2005 it significantly improved its cost estimation processes. Any resulting improvements may not yet be reflected in the available data. Also, some costs have increased by greater than the rate of inflation and this will account for part of the increase.

Transpower has also advised that a significant factor in the level of change from the PAD approved budget to actual costs was changes in project scope. However, in our view, while project scope changes will be inevitable from time to time, accurately scoping projects is an important aspect of effective capital works management. We note that all six projects were subject to scope changes which added \$1.7m to the initial budgeted total of \$3.0m.

We also note that the \$20.0m of projects which have arisen in the 2006/07 Business Plan, but which were not reflected in previous Business Plans, represents a risk to Transpower under a threshold regime. Inevitably, unforeseen projects will arise, but Transpower should be in a position to anticipate most eventualities and, to a certain extent, should be able to manage the remaining risk by adjusting the priority of works.

We understand that Transpower is only now beginning to establish a process to monitor and compare estimated costs and the actual final cost of projects. We would have expected that, as part of the process of improving the accuracy of cost-estimation and monitoring the performance of the challenge process, this would be a well established practice.

Our view that the project cost estimation process has a relatively wide margin of error is supported by the fact that 'refining estimates' is the largest single cause of project cost changes.

6.3 Recent Budgeted & Forecast Costs Changes

Transpower has recently provided updated data for replacement, refurbishment and enhancement capital expenditure. The table below provides a summary comparison of the current data with that previously provided.

Replacement Refurbishment & Enhancement Capital Expenditure - Updated Figures				
\$ millions	2006/07	2007/08	2008/09	Total
January 2007 figures	51	61	61	173
April 2007 figures	48	53	92	193
% change	-6%	-13%	51%	12%

The table reflects an increase in the total value of projects over three years by \$20m (12%). Year Three (2008/09) increases by more than half as a result of the overall increase and the reallocation of projects from prior years.

Comment

While Transpower has clearly signalled throughout the review that project cost data would change constantly Strata has been surprised at the extent of this recent change, particularly for Year Three. As a consequence Strata does not consider it would be appropriate to use the data as a basis for establishing a threshold without a detailed reconciliation and investigation into the changes to identify the extent to which the figures require adjustment.

7. Best Practice

In addition to our review of the policies procedures and practices Transpower has applied, consideration was also given to what would constitute best practice to ensure replacement, refurbishment and enhancement expenditure was least-cost. Set out below is our view of what would constitute best practice and a comment on whether Transpower conforms:

- Policy settings which clearly set out the least-cost objective (and any limitations or balancing factors) and which are not constrained or compromised by other objectives.

Transpower is considered to conform.

- A focus at Board and Executive level on the effective implementation of the least-cost objective including the setting of specific (savings) targets and measuring and reporting on progress.

We are not aware of specific savings targets or of any measures of performance in capital expenditure management other than the very broad capital spending KPI. To monitor the efficacy of the cost estimation, challenge and contracting processes we would expect to see a comparison of estimated project costs with actual project costs.

- A consistent focus at all levels throughout Transpower on minimising capital expenditure.

We do not consider there is a sufficiently strong focus on cost minimisation within Transpower to ensure the least-cost objective is achieved.

- Assignment of responsibility to a particular group or position within Transpower for ensuring an appropriate focus on cost containment in the capital expenditure process and for reporting appropriately on it

The Business Services Manager is tasked with reviewing and signing off the business case for capital expenditure however Strata questions whether this position would have sufficient time available to bring adequate focus on to least-cost capital expenditure.

- Procedures and processes which ensure:
 - the need for expenditure is correctly identified;
 - the most cost-effective solution is selected, including whether to replace or refurbish. Note this is not the same as achieving least-cost expenditure because, even after selecting an appropriate technical solution, it is essential the policies, processes and practices governing solution specification, cost estimation, tendering, contracting, project / contract management are optimal;
 - the lowest possible cost is consistently and correctly determined;
 - the full range of relevant factors are considered (including asset condition assessments, best practice, environmental conditions, future plans and scenarios); and
 - timing of the works is optimised.

We consider that Transpower performs well in achieving the above, except that: to some extent it is likely to overspend to achieve a high degree of certainty regarding the security of supply; and, it is unlikely to be consistently and correctly ensuring the least-cost outcome. We consider these issues are unlikely to be addressed without the introduction of further measures aimed at cost containment e.g. an open-book contracting basis.

- Appropriate controls, checks and balances throughout the entire capital expenditure process to ensure cost-benefits are properly assessed on the basis of least-cost data and are taken account of in asset management decision making.

Transpower does take steps to assess cost-benefits of various options, however, it is doubtful whether the input data always reflects least-cost options. Transpower could take further steps (such as the open-book contracting basis) to better ensure that the options it is analysing are truly least-cost.

- A rigorous internal challenge process which can effectively challenge on price. Ideally (setting aside other considerations) this process should be 'owned' by a structurally separate group within Transpower from that which is responsible for maintaining and managing the Grid.

From the information provided, we do not consider that the internal challenge process currently has the necessary level of rigour. We are not aware of specific responsibility being assigned to minimise capital expenditure.

- A regular independent external audit of a sample of projects

We are not aware of any independent audit conducted with a view to assisting the process of monitoring and minimising capital expenditure.

- Procedures and processes which maximise competition in the tendering and letting of contracts. These should take into account:
 - the highly specialised and skilled nature of much of the work;
 - the often limited pool of providers of such services; and
 - Transpower's position as a major purchaser of such services.

As discussed, our view is that the alliancing principle is sound given these factors. We consider a change to an open-book contracting basis would allow Transpower to exert downward pressure on capital expenditure.

- Contractual provisions and inspection procedures by which the quality of replacement, refurbishment and enhancement works is ensured to be of a high standard. This will best ensure the avoidance of the need for remedial works or reduced asset life as a result of poor performance by the contractor.

We have not focused heavily on this aspect but have noted in our research a significant number of instances where Transpower has to repeat works or replace equipment sooner than expected because of poor quality workmanship at some time in the past.

- Effective processes to ensure continuous improvement in the accuracy of forecasting which captures the lessons learned.

We understand some steps are already being taken to capture the benefit of experience in the cost-estimation process, however, the level of cost increases due to re-estimation suggests more could be done. We know that Transpower is only just beginning to establish a basis on which to compare the initial HLR and PVD cost estimates with the PAD approved budget figures and these figures with actual costs. These measures would appear to be essential to monitoring and improving performance in managing replacement, refurbishment and enhancement capital expenditure so as to achieve the least-cost objective.

8. Potential efficiency and cost reduction gains

Efficiencies and cost reduction gains can be expected from:

Efficiencies and cost reduction gains would be expected if Transpower were to:

- apply greater focus at Board and Executive level on the effective implementation of the least-cost objective, including setting specific targets in relation to capital expenditure and measuring and reporting on progress. These targets, measurements and reporting regimes should include targeted capital expenditure savings, reducing the variability in project costs (initial estimate vs approved budget vs actual), monitoring and reporting on the impact of cost containment measures;
- establish additional controls, checks and balances throughout the entire capital expenditure management process. This is particularly important given the focus on the security of supply which strongly encourages Transpower to

adopt a very cautious approach to replacement and refurbishment capital expenditure, potentially initiating projects where they are not immediately required. An important step in this regard would be to assign responsibility within Transpower for ensuring the least-cost objective is keenly focused on at each stage. Proposers and approvers of projects alike could be required to satisfy themselves that this objective has been met;

- apply a more rigorous internal challenge process which can effectively challenge on price. Ideally, setting aside other considerations, this process could be 'owned' by a structurally separate group within Transpower than that which is responsible for maintaining and managing the Grid. Responsibility could be assigned within Transpower for this function and include the specific task of minimising capital expenditure, subject to meeting Transpower's other obligations;
- ensure a regular independent external audit of a sample of projects is conducted;
- establish alliancing arrangements on an open-book basis and setting capped levels of return;
- improve the flow of actual project cost data back into the project cost estimation process; and
- confirm the adequacy of the current contractual provisions and inspection procedures by which the quality of replacement and refurbishment works is ensured to be of a high standard and by which the appropriateness of the actions of contractors responsible for initiating projects can be assessed.

9. Reasonableness of projects and project costs

- in our view, it should be possible for Transpower to achieve a minimum reduction of 5% within 18 months i.e. by the middle of the 2008/2009 financial year. This is a subjective view based on the gains we would expect to be achieved if Transpower were to implement best practice measures not presently applied. It is difficult to quantify precisely the achievable reduction in capital expenditure levels because the focus of the study has been on the appropriateness of policies, processes and practices rather than on reviewing individual projects (which time would not permit). In our view, some reduction is clearly justified and, in an endeavour to under-adjust rather than over-adjust, we have taken the approach of estimating the minimum reduction possible. We consider this a conservative adjustment and expect that greater gains are possible if Transpower was to implement measures focussed on achieving least-cost capital expenditure. It should be noted that Transpower has provided comment that a 5% reduction in tower painting costs should be achievable through contracting over a longer term
- Transpower has recently provided updated data for replacement, refurbishment and enhancement capital expenditure which reflects an increase in the total value of projects over three years by \$20m. This, together with a reallocation between the years, has resulted in Year Three increasing by more than 50%

from \$61m to \$92m. As a consequence of the scale of the changes in Year Three (2008/09) Strata does not consider it appropriate for the data to be used as a basis for establishing a threshold without a detailed reconciliation and investigation into the changes to identify the extent to which the figures require adjustment

- Transpower has advised that, while replacement, refurbishment and enhancement projects are sometimes approved on a basis which includes contingencies, such contingencies are excluded from budgeted and forecast capital expenditure. Consequently no adjustment for contingencies is required. If they had been included it would be appropriate to reduce contingencies down to a minimal level because, in Strata's view, the threshold should exclude contingencies so as to reflect the actual expected level of expenditure.

On this basis, a downward adjustment of 5% in each of the three years would be appropriate. This should be applied to inflation- adjusted figures in the second and third years.

10. Section II: Information Technology Expenditure

10. Background

In order to meet its obligations as system operator and network owner and to comply with the relevant legislation, standards and EGR, Transpower undertakes investment in IT. A proportion of this expenditure is required for Transpower to perform its obligations under the System Operator Service Provider contract.

In addition to this capital expenditure, Transpower undertakes a number of other capital projects to upgrade or replace IT services. Such expenditure is not currently scrutinised and approved by the Electricity Commission. Whilst still meeting its service obligations, Transpower is required to manage these programmes in a manner that ensures the services grid users and consumers want are delivered at least-cost.¹¹

Transpower defines each of the key categories of IT capital expenditure (which will be subject to a threshold) as follows:

Telecommunications:	capital expenditure relating to the upgrade and replacement of the telecommunications network used for operating the grid
SCADA EMS:	capital expenditure relating to the upgrade and replacement of the application System Control & Data Acquisition / Energy Management Systems (SCADA EMS) used for operating the grid
SCADA RTU Protocol:	capital expenditure relating to the upgrade and replacement of the Remote Terminal Units (RTU) and other station devices used for providing data to SCADA and other grid-operating applications
Network Systems R&R:	capital expenditure relating to the maintenance of components such as RTU's, and the refurbishment and replacement of systems used in support of operating the grid, such as asset management systems

Within these categories, Transpower has established a number of Portfolios which bring together like services. These Portfolios are Asset Management Systems, Enterprise Solutions, Market Systems, IT Security, Real Time and Stations, Services and Infrastructure and Telecommunications and Networking.

¹¹ GPS on Electricity Governance October 2006 paragraph 80 (page 20)

11. Approach taken

A desk top study was undertaken to assess, at a relatively high level, whether the policies and processes which have been applied best ensure that the least-cost capital expenditure objective is achieved. We have not conducted a technical review of individual projects, although a significant degree of focus has been placed on the SCADA/EMS and Telecommunications Network upgrade projects because they are the two largest single projects. We note that, over the three year period under review, these two projects represent 83% of the total capital expenditure that would be subject to a threshold.

The following aspects have been considered:

11.1 Policy, principles and objectives

Transpower's policies and other documents that govern and provide guidelines for the evaluation, planning and implementation of capital expenditure on IT were identified and reviewed. These documents included:

- Rules for Procurement – Dec 2006
- Information Systems Strategic Plan – September 2004
- Information and Communications Technology Governance Board Charter – May 2004
- Condition Assessment policy for IT equipment and facilities – October 2004
- Contingency & Management Reserve Funding guidelines – June 2006
- Technical Standards (12 in total) for specific items of equipment or specific actions – various dates

The principles on which the policies are based were identified together with relevant objectives that have been set. The review considered the appropriateness of the policies and any omissions that would be reasonable for Transpower to have included.

11.2 Procedures processes & practice

A review was undertaken of Transpower's procedures and processes and their application when implementing and managing the capital expenditure on IT. The review considered the contribution these procedures and processes make in ensuring capital expenditure is reasonable and least-cost.

11.3 Measurement and performance

Transpower's approach to measurement and reporting of its IT asset management performance, including benchmarking and past performance, was reviewed. The review included an investigation of whether the benefits of past experience are captured in IT planning and cost management.

11.4 Best practice

In addition to the above analysis, a view was taken on which key policies and practices would best ensure that capital expenditure on IT was reasonable and least-

cost. This was then compared with Transpower's actual policies and practices to gauge the extent to which these matched and where any gaps existed.

12. Policy principles & objectives

12.1 Government Policy Statement on Electricity Governance

The Government Policy Statement on Electricity Governance issued in October 2006 provides (at Para 80) among the objectives for the provision of transmission services that:

“the efficiency of transmission services should be continuously improved so as to produce the services grid users and consumers want at least cost”.

It should be noted that, while the focus of this report is on the extent to which the least-cost objective is being achieved, Strata does not suggest this should be at the expense of achieving the other objectives set out in the GPS. These include grid reliability, diversity of supply to larger load centres and the facilitation of competition.

12.2 Statement of Corporate Intent

Transpower's 2006-2007 Statement of Corporate Intent (SCI) includes objectives to:

- promote efficient investment in the National Grid to provide the platform for a competitive wholesale market thus enabling options for investment in generation and demand-side management;
- seek to efficiently recover the full costs of its services;
- improve the efficiency of its services, whilst optimising asset reliability and availability;
- be as profitable and efficient as comparable businesses not owned by the Crown; and
- seek to provide transmission services at the standard of quality and security agreed with National Grid users or required by regulatory agencies.

12.3 Business Plan 2006/07 (October 2006)

The Business Plan 2006/07 repeats the cost management and efficiency objectives set out in the 2006-2007 Statement of Corporate Intent (see above). It also refers in *Appendix 1: Efficient Performance* to the use of benchmarking to:

“...monitor cost and service trends and highlight areas of potential cost anomaly or cost outliers, which may require further scrutiny.”

For the purposes of managing capital expenditure, Transpower IT does not utilise data from the three benchmarking studies¹² referred to in the Business Plan but does obtain data from the KPMG Utility Survey. However, Transpower has advised that data is

¹² International Transmission Operations and Maintenance Studies (ITOMS), Group of International Comparison of Transmission System Operation Practice (GICTSO), Transmission Operation and Maintenance Costs.,

collected from participants across a number of different sectors and that Transpower's confidence in the data, as a relevant comparator, is not high. For the first time this year, Transpower has been involved in framing a number of questions which will be included in the next KPMG Utility Survey, and data will be collected from all Australian TNSP's. This is likely to improve the value of this data as a comparator.

The Business Plan sets out a number of Key Performance Indicators relating to financial, operational, EGR compliance and health and safety performance. The Business Plan refers (at Page 7) to Key Performance Indicators being used to achieve Transpower's Objectives, including actual performance in delivering value to both shareholders and customers. However, the only measure relating to capital expenditure on IT is the Capital Spend KPI. Under this KPI, Transpower is to deliver approved projects without exceeding Board approved capital spend for the year.

In PricewaterhouseCoopers' *IT Governance Review* of June 2005, criticism was made (at page 3) that the KPI's and metrics for the IT Division were not comprehensive. Partly in response to this, Transpower has implemented the Balanced Scorecard to measure Transpower's performance. Measures include:

- **IT Capital Spend (actual spend) vs Board Budget.** This is a simple measure which compares actual capital expenditure with budget. In the year to date to November 2006, actual capital expenditure of \$19.1m was under the budget of \$25.9m by 26%. In October 2006, the actual spend was approximately 40% below budget. Under the Balanced Scorecard approach, this was regarded as a weakening performance, i.e. the movement from 40% below budget to 26% below was regarded as a worsening situation.
- **Percentage of projects tracking to original scope.** This is a subjective measure which takes into account staying within scope and meeting milestones. Since August 2006 through to November 2006, this measure has steadily declined from 70% to just 30% of projects tracking to scope. Depending on the extent to which they are outside the scope, this has potentially significant implications for the timing of capital expenditure
- **Percentage of milestones missed in the reporting period.** This has increased from approximately 25% in July 2006 to 44% in November 2006.

Performance against these measures is reported via the General Manager to the CEO.

Comment

The GPS, SCI and Business Plan clearly articulate the requirement that capital expenditure (including capital expenditure on IT) is used as efficiently as possible and is carried out on a least-cost basis. **However, the Capital Spend KPI is unlikely to be effective in ensuring the achievement of least-cost capital expenditure because any least-cost inefficiencies will already be embedded in the budget figure against which actual costs are measured.** The KPI will only be effective in ensuring the least-cost objective is achieved to the extent the underlying policies and processes are effective. There is also the opportunity to defer projects in order to meet KPI's. **The KPI will not provide significant incentives for Transpower to ensure the least-cost objective is achieved.**

The Balanced Scorecard approach of comparing actual capital expenditure on IT with budget is also unlikely to be effective for the same reasons (because any

inefficiencies will be embedded in the budget). Also, it is not always clear what the performance data actually tells us. The actual versus budget measure is considered to reflect weakened performance if actual capital expenditure increases to become closer to the budget. However, such a movement could easily reflect improved performance in meeting timelines which would accelerate the spend.

We note that, given the lack of appropriate benchmarking data, Transpower is not in a position to use benchmarking as a means of assessing its performance in achieving the least-cost objective. **It is, therefore, important that benchmarking is not assumed to be a safeguard which effectively guarantees that the least-cost objective is met.**

We would have expected a greater linkage between the least-cost objective and Balanced Scorecard measures and KPI's.

12.4 IT restructuring & realignment

12.4.1 Organisational & strategic reviews

During the course of 2003/2004, Transpower's IT functions underwent a major restructuring and re-focusing. This has impacted positively on Transpower's performance in achieving the objective of least-cost capital expenditure on IT because of its significant effect on the policies, principles and objectives applied to Transpower's IT functions. These policies, principles and objectives have, in turn, impacted significantly on the processes by which capital expenditure on IT projects is initiated, evaluated and managed, and on how projects are implemented.

During 2003/04, a number of studies were undertaken of which an organisational design study by LTS and a current state assessment by Azimuth were key. The central conclusions reached were that there was:

- an extreme organisational split of IT Planning and IT Delivery leading to severe dysfunctionality and inappropriate systems solutions;
- a significant lack of architecture capability – starting at the enterprise level and leading to incoherent point solutions;
- a lack of service focus;
- poor assurance in respect of IT standards, practices and solution quality;
- no governance of IT;
- inadequate business analysis;
- ad hoc customer engagement;
- limited security resources for a critical infrastructure service provider; and
- some applications reaching the end of life cycle.

12.4.2 Information & Communication Technology Governance Board

In May 2004 the Information & Communication Technology Governance Board (ICTGB) was established subject to a Charter. This sets out (at page 3) the Board's goal of ensuring that the Executive has the information it needs to make informed decisions that are essential to achieve the ultimate objectives of ICT governance. These objectives were defined as:

- alignment of IT and the business;
- delivery of value by IT to the business;
- sourcing and use of IT resources;
- management of IT-related risks; and
- measurement of IT performance.

The Charter sets out key governance principles (at pp 3-5) of which the following are relevant to achieving least-cost capital expenditure:

- the key governance principle will be openness and contestability;
- Transpower expects a return on investment in projects that meet or exceed the company target for Return on Capital Employed;
- business managers are accountable for (among other things):
 - recovering the value of IT investments: and
 - realisation of business benefits;
- the General Manager, Information Technology, is responsible for (among other things) managing IT capabilities, skills and resources to assure the effective application of:
 - IT standards, practices and a repeatable systems delivery life cycle;
 - systems methods and practices which are insightful and which meet industry standards for quality and good practice; and
 - establishing and enforcing compliance with enterprise, architectural and interoperability standards which reflect good industry practice;
- the development, implementation and maintenance of systems are contestable activities, which will be overseen by the ICTGB and contracted and managed according to the contestability guidelines set out in IT policies;
- in keeping with the principles of contestability within Transpower, every Transpower manager who has accountability for an IT outcome, should be aware of best practice relating to that outcome and able to demonstrate that all practical steps have been, or are being taken to at least match best practice. This accountability includes seeking advice on best practice and effective utilisation of Transpower resources; and,
- the relationships between business units, the IT business unit, and corporate management exist in a contractual framework, which is recorded in service level agreements between the parties.

12.4.3 IT Organisational restructuring

Prior to 2004, the planning and solutions design of IT services was the responsibility of the IT&T Planning unit reporting to the GM Network. Service delivery was the responsibility of IT&T Service Delivery reporting to the GM Service Delivery. The restructure in July 2004 combined the functions of IT&T Service Delivery and IT&T Planning with a new reporting line directly to the GM IT who had been appointed to the newly created position in February 2004.

12.4.4 Information Systems Strategic Plan

In September 2004, PA Consulting produced the Information Systems Strategic Plan (ISSP) document for Transpower. This provided a further review of Transpower's IT function and proposed a new strategic focus and a programme of work for migrating the current services to a state more able to meet Transpower's future needs.

PA Consulting developed the ISSP through a combination of workshops, interviews, surveys and document reviews to make an assessment of the IT function at the time, the drivers of change in the business, the priorities for the business and the options available to Transpower to move forward.

PA Consulting concluded that:

- many applications were not suited to meet future demands;
- there was a structural inability to provide valuable, timely and accurate information to the business;
- technology obsolescence and legacy issues were inhibiting the full realisation of benefits from more recent and future technology investments;
- most of Transpower's telecommunications technologies were at end-of-life and were not able to support anticipated future demands; and
- some of the IT process areas that were critical to the efficient and effective delivery of anticipated IT demands were ineffective.

PA Consulting concluded that change in the demands of the business and in the organisation's environment (e.g. regulator, market design) would occur and that these changes would place more extreme demands on IT than in the past. It was therefore necessary to strengthen the IT environment and introduce agility and flexibility to enable IT to respond to future business change. The key factors which would drive change over the next five years were identified as:

- significant new or changed business processes were likely to result from current programme of work to make the grid more robust and sustainable;
- new and / or changed requirements flowing from the move to a new and independent regulatory environment;
- likely increased pressure (via the Regulator) on cost savings and efficiency imperatives;
- increased emphasis on risk identification and risk management; and
- more emphasis going forward on adopting good industry practice.

Key strategic objectives defined in the ISSP are:

- establishment of an Enterprise Architecture capability (EA) that allows IT to be deployed as a responsive, flexible asset and IT investment to deliver sustained benefit to the business. The ISSP notes (at page 76) that the holistic view that EA promotes, coupled with key architectural principles, ensures that investment decisions are made in the wider context of achieving a cost-effective, technically convergent and integrated IT architecture;

- fulfilment of Transpower's immediate critical information needs whilst establishing a sustainable information management capability;
- establishment of a robust and flexible Applications Environment that meets and supports the business needs and facilitates future business change;
- strengthening of the Telecommunications & Networking environment and services to support anticipated future business needs; and
- strengthening of the IT processes that are critical to the delivery of the ISSP and ongoing effective IT support to the business.

A five year programme of nine workstreams arose out of these strategic objectives:

Application Replacement & Enterprise Architecture (EA)

A programme of work to replace existing Market Systems and Asset Management Systems within the context of an EA process.

Critical Information needs

A programme of work to identify and address the immediate information needs of the business

IT process effectiveness

A programme of work to develop and build on existing core capabilities and best practice IT processes.

Telecommunications & Networking Design & Planning

A detailed replacement plan for the installation of optic fibre on core routes, supported by microwave radio technologies.

Telecommunications & Networking Sourcing Strategy

A detailed review of the ability and suitability for the external supply market to participate at any level of the telecommunication & networking replacement programme, particularly in the area of fibre rollout and microwave replacement and the services provided above this core infrastructure layer.

Execute the Telecommunications & Networking Sourcing Strategy

A detailed rollout and implementation plan for telecommunications and networking.

SCADA Upgrade

Upgrade the SCADA system to a robust condition.

Set Equipment Standards for Substations Devices

Establish standards for intelligent substation devices.

Test Feasibility of Outsourcing MDM

Establish technical and commercial feasibility of using an external meter data service provider.

The ISSP is currently undergoing an update. It is understood to be likely the revised ISSP will set a strategy and programme of workstreams extending out 15 years.

Comment

The scale of the change in Transpower's IT function occasioned by the restructuring and realignment process which arose out of the ISSP and other major studies done both before and afterwards has been immense. The resulting strength and focus of the strategic and policy framework has had a significant positive impact on the achievement of the objective of least-cost capital expenditure through its influence on processes and the discipline of linking the evaluation of proposed actions back to core objectives. . As a result the initiation, consideration and implementation of capital expenditure proposals are subject to a relatively standardised, disciplined approach. These processes are considered in detail at *13. Procedures processes & practice* below.

12.5 Procurement Policy

Transpower's procurement policy is governed by the *Rules for Procurement* policy. Although the copy sighted is labelled draft and dated 24 November 2006, we understand that Transpower's Board has now approved it. This policy operates in conjunction with the Contractor Acquisition and Management Policy. The *Rules for Procurement* policy provides (at 1.1 page 3) that:

“It is a requirement that Transpower procurement activities deliver goods and services to meet specified minimum performance criteria for the lowest “whole of life” cost, through the use of a transparent, efficient, fair, and auditable set of processes and procedures.”

The policy provides that any contract exceeding \$200,000 must, except in certain limited circumstances, be subject to an open tender process. Also, unless a Division determines it is not in Transpower's interests to award a contract, it must award a contract to the supplier that has been determined to be fully capable of undertaking the contract, and whose tender is determined as offering the lowest evaluated whole of life price.

The document also sets out a number of provisions covering the general approach to procurement, technical specifications, tendering procedures and awarding contracts. These are best-practice requirements, intended to maximise the efficiency of the procurement process. It includes a provision that Divisions may seek to establish preferred supplier arrangements. Particular contracting relationships (outcome based, open-book and alliancing) are considered at *13.6 Competitive Tendering Processes* below.

Comment

The draft corporate *Rules for Procurement Policy (24 November 2006)* provides a tightly focused requirement on Transpower's procurement activities to ensure goods and services meet minimum performance criteria through a transparent, efficient, fair and auditable process which includes an evaluation of the lowest whole-of-life cost. Subject to effective implementation, we consider that this policy is likely to improve the achievement of least-cost outcomes.

However, the policy has only recently been issued, which we note was after the budgets had been developed and the review of Transpower's capital expenditure by Strata commenced

12.6 Asset specific policies

Transpower has a number of standards which set out policy in relation to capital expenditure on specific categories of IT assets. Standards are developed by working groups comprised of internal IT and business staff as well as external experts. All standards are developed taking into account industry best practice, health and safety, risk and cost.

In some instances, these set out condition assessment requirements which directly impact on capital expenditure requirements. However, the standards sighted primarily cover technical specifications for design, installation and testing. Any solution is required to conform to these standards.

Comment

The focus of these standards is primarily on technical specifications and. It is not surprising that the management of capital expenditure, through these documents, does not appear to be a strong focus.

13. Procedures processes & practice

13.1 Policy development & review procedure

Transpower standards and policy documents are controlled documents which are subject to registration and version control. The requirements for the content and the procedure for developing such documents is set out in the *Guidelines for Transpower Controlled Document Development* (October 2005) and in accordance with the *Corporate Policy Framework* (January 2006). Policy documents are generally required to explain the reasons for the policy, identify any linkages to high-level overarching policy documents (such as the SCI) and define the process by which the policy is to be given effect.

13.2 Transpower Solution Life Cycle

Templates

The Transpower Solution Life Cycle (TPSLC) defines the process whereby an initiative progresses from concept through to implementation and into production. A suite of template documents is used to regularise the approach taken in each project. Transpower advises the use of the templates is mandatory, irrespective of the size of the project. The templates include:

- Concept document
- Requirements document
- Future Business State Design
- Technical Design
- Business Case
- Test Plan
- Issues Register

- Solution Options & Decision
- Risk Register
- Build Plan
- Handover documentation
- Project Variation Request
- Project Management Plan
- Deployment Plan
- Post-Implementation Review; and
- Communication Plan.

Concept Document

A project will usually be initiated by a Portfolio Manager using the Concept document template. Transpower advises a Concept document is completed for every project except for straightforward capital expenditure on telecommunications.

We note that the sample of concept documents sighted are all just two pages long. These documents set out, very briefly, the proposal and note the expected benefits in one sentence without any supporting analysis. The broad cost estimate provided does not contain an explicit contingency or reserve sum. Transpower has advised that the format of the Concept document has changed and is now six pages long including a one page appendix which provides an example of a cost-benefit analysis.

The Concept document, which must be signed off by the Project Sponsor and the Business Owner, will trigger a sequence of actions which will involve developing an investigation plan, further defining the requirements, considering technical design solutions, test plans, training plans and resourcing requirements. Provided the investigation supports proceeding, then a Full Business Case document will be prepared to seek approval for the expenditure. The challenge process is discussed in greater detail at 13.3 *IT Planning & challenge process*.

Some projects are initiated as a result of the condition assessment process which is set out in *Condition assessment for IT equipment and facilities* specification April 2006. This provides (at page 4) that all operational IT equipment is uniformly condition assessed on a consistent basis. The specification sets out guidelines for assessment and the steps to be taken based on the assessment. On the basis of the data collected, IT Production Services then prioritises replacement or refurbishment.

Business Case SCADA EMS Upgrade

The Business Case for the \$17.4m SCADA EMS Upgrade comprehensively sets out the analysis of the business problem. As required by the template for the Business Case, a relatively detailed cost-benefit analysis and calculation of the Net Present Value (NPV) and Internal Rate of Return (IRR) of the project is provided.

However, the discussion of the alternative solutions was relatively limited. The separate Board paper, under which Transpower's Board gave its approval, was similarly limited and the Board was not provided with any other analysis. Transpower has advised that the General Managers for System Operations, National Grid and Information Technology were on hand at the Board meeting to answer any

questions. Immediately after the Board Meeting, but before the Business Case was approved, a further paper was produced which assessed the options more carefully and set out the case for the solution selected.

We note that in its review of the probity of the single source decision regarding SCADA, PricewaterhouseCoopers were critical of the lack of formal review of SCADA procurement options but acknowledged that a purchase from Areva might be a 'practical' option. This review was conducted 1-2 months before the Board paper.

Transpower visited Electranet in Adelaide in February 2006 to ascertain whether any lessons could be learned from its recent experience of an Areva SCADA EMS upgrade. Electranet's costs were found to be significantly lower however, the data was not comparable because of Transpower's larger number of transactions and displays, greater hardware and software complexity, larger number of users and higher level of support required.

While the SCADFA EMS Upgrade Business Case set out the costs and benefits in some detail, nothing was disclosed regarding the steps being taken to achieve the least-cost objective. This was a particularly important issue in this instance because Transpower had elected to pursue a single-source strategy. Transpower was upgrading, rather than replacing SCADA and the strategy meant that the incumbent, Areva, would have to be the supplier of the upgrade. This put Areva in a position where potentially, it could potentially exploit that position.

Also, this was in the context of the situation where, since commissioning in November 2001, the existing SCADA system has (as set out at page 10 of the Business Case) remained essentially unchanged and Transpower had been unable to benefit from ongoing development by Areva. This was despite the establishment of a Gold Support agreement with Areva and an intention to implement a rolling upgrade program.

The Project Management Office (PMO) guidelines provide for the addition of a 10% contingency to cover the risk that known tasks, that cost more than estimated, and a 10% management reserve to cover any unforeseen costs. The exception to this is for the purchase of hardware, where a flat 5% contingency and no management reserve is applied.

Also, Transpower has advised that a Full Business Case is not presented for approval unless Transpower has a firm price. However Transpower has confirmed the project cost stated in the SCADA EMS Business Case was an 'estimated maximum' with confirmation of price to subsequently occur on the basis of a detailed statement of work. Transpower's advice is that the project was sufficiently urgent to warrant this departure from procedure.

Business Case - Telecommunications & Networking Upgrade

The Business Case for the Telecommunications and Networking 5-Year Transformation Programme was prepared in November 2006. This sought approval in principle to commit to a total cost of \$232m, comprised of \$123m capital expenditure, operating expense of \$60m and lease costs of \$50m, spread over the current year and ensuing five years. This indicated that approval to proceed would be sought subsequently on the basis of separate Business Cases being submitted for each project.

The Business Case set out the business requirements showing clear linkages back to Transpower's strategic objectives. The options available were fully assessed against technical and commercial requirements, including cost. The analysis of costs included NPV calculations over a five year and twenty year basis, comparing the base case (continuing the present basis of servicing Telecommunications requirements) with the proposed solution. Over a twenty year period, the proposed solution resulted in an NPV \$50m better than the base case.

The Business Case and supporting documentation indicated a thorough appraisal of the sourcing options for the proposed solution, the benefits of a mix of lease and purchase options, the governance arrangements, resource availability, risks and issues. Costs were clearly a focus and it was noted the proposed solution would deliver cost benefits as a result of the strategic approach, particularly the purchase from a smaller number of suppliers and the mix of lease and purchase options.

Project Approval

Business Case documents progress to the required level of delegated authority for approval. The table below sets out for the 2006/07 year the split of approvals at the various delegated authority levels. This shows that 75% was signed off at CEO or Board level.

2006/07 Year IT Capital Expenditure Approvals by DFA Level

DFA Level	Approval Limit	Total	%
Portfolio Manager	up to \$250k	5,240,123	9%
Senior Management Team	up to \$500k	4,929,741	8%
IT General Manager	up to \$1m	4,913,838	8%
CEO	up to \$5m	7,439,000	13%
Board	over \$5m	36,966,298	62%
Total		59,489,000	

The table below shows that 72% of projects had approved Business Cases as at the commencement of 2006/07.

2006/07 Year IT Capital Expenditure Approvals as at 1 July 2006

Project Status	Total	%
Business Case Approved	43,004,075	72%
Proposed	16,484,925	28%
Total	59,489,000	

Project Governance & Delivery

Having obtained approval for the Full Business Case, the solution design and detailed architecture will be completed and approved by the IT Design Authority as a final check on compliance of the solution with internal standards and frameworks. A Project Charter and Project Plan will be developed and approved where necessary. For each project a Project Team, Project Council and Steering Committee will be established.

The Project Team is responsible for delivery of the project and reports weekly to the Project Management Office (PMO) on progress against budget and milestones and raises any issues. All IT projects, except those carried out by Field Services, are run through the PMO which has responsibility for monitoring these and managing interdependencies between projects.

The Project Council's function is to provide stakeholder representation for decision-making on day-to-day project issues. The Steering Committee is responsible for the governance of the project and ensuring alignment with business objectives. It monitors progress against plan and budget through reports. It is responsible for reviewing and resolving escalated risks and issues and for reviewing audit and quality reporting.

Comment

The Concept information sheets sighted were very limited documents in terms of the analysis of the costs and of the benefits. However this has been improved in the latest version of the concept document template through the addition of a more detailed cost-benefit analysis in a one page appendix. Whilst the costs do not contain a contingency or management reserve, the cost estimates appear sufficiently broad to suggest some buffer is built in.

The focus of the condition assessment specification is primarily on performance and reliability and has a formulaic approach to the timing of replacement or refurbishment with the number of years to replacement being specified for each condition assessment level. Overall, the focus on condition assessment as a tool to achieve the least-cost objective does not appear to be high.

While the Business Case document requires a cost-benefit analysis, we make the point that, in itself, this is not sufficient to ensure that least-cost capital expenditure is achieved. This analysis can only be as good as the quality of the input data. Therefore such analysis cannot be relied on as a safeguard which ensures that the least-cost objective is achieved. To better ensure this the Business Case template could be amended to require discussion of the steps taken to ensure the least-cost-objective is met and to require that the supporting and approving signatories must satisfy themselves in this regard.

It would appear that, while the SCADA EMS Business Case did not follow guidelines entirely, the single-source solution proposed nevertheless appears to be the appropriate one. However, we would have expected a fuller analysis of the options. We would also have expected that the Business Case and the Board paper would have identified the risk that Areva would seek to take advantage of its position as the only supplier of an upgrade option. This risk and the steps to mitigate it should have been set out. It is understood Transpower sought to minimise the risk through negotiating a contract rather than accepting a standard book price or a take it or leave it quotation.

13.3 IT planning & challenge processes

In late March each year, Portfolio Managers present prioritised proposed project lists to the General Manager IT, the Strategy and Architecture Manager and the Development Manager. The proposed projects are challenged on the basis of the importance of the project, the nature of the project, the cost and proposed timing.

The projects are separated into various categories:

Category 1: “must do” initiatives such as the Market Systems Project (MSP), Telecommunications and their enabling projects

Category 2: “should do” initiatives

Category 3: initiatives that are proposed for deferral till the following financial year but which could be advanced

IT Division has a system for prioritising projects which takes into account a wide range of factors:

- business criticality;
- key project dependencies (such as the Market Systems Project and SCADA Upgrade);
- whether a Business Case has already been signed off (which among other things considers cost);
- the likelihood of completion in the current year;
- buy-in from the business (stakeholders);
- delivery risks (dependencies and complexity);
- IT resource availability;
- business resource availability; and
- risk to Transpower of non-completion.

These factors are given a weighting and the resultant points scored provide a ranking of projects. On the basis of this, decisions are made regarding the timing and scope of projects. This challenge process generates a wide range of questions which are dealt with progressively over the following two months. At the weekly meeting, responses to the questions are presented and the proposed project debated.

At the end of May (to fit into the Business Planning cycle) a prioritised list of projects is reviewed and subject to challenge by the entire IT senior management team. The Divisional Business Plan is then finalised and submitted to Corporate Services and the Executive on 31 May. The Divisional Budget is then reviewed in accordance with Budget Guidelines and, as part of this process, the proposed capital expenditure is likely to be challenged further. The divisional plans are then consolidated into the overall Business Plan which is finally put to the Board.

In 2006, the initial lists of proposed projects produced by Portfolio Managers totalled approximately \$120.0m. By the time the Divisional Business Plan was finalised on 31 May, this had been reduced to \$82.7m. Transpower attributes this significantly to the efficacy of the challenge process. We sought information and data from Transpower that would substantiate this claim but, while this gave details of the changes, it did not clearly demonstrate that these arose directly as a result of the challenge process. However from our understanding of the challenge process we consider this likely to be true in large part although, to some extent, the deferral of some projects was probably unavoidable because of delays in interdependent projects.

Although Business Cases are presented throughout the year for formal approval, by the commencement of the financial year on 1 July, the majority of proposed projects for that year will have approved Business Cases. On 1 July 2006, 72% (by value) of projects were subject to an approved Business Case. During the course of the year, project-end costs for the current year are reviewed monthly, including those not yet subject to a formal approval of a Business Case.

Comment

The process of categorising projects in broad groups according to priority, status and inter-dependencies, and then allocating points on the basis of a range of key factors, is considered to be a good one. This process provides a reasonably robust challenge process to ensure that the projects are justifiable and are given appropriate priority, and that resources are available to deliver them and inter-dependencies with other projects are taken into account.

The emphasis on providing highly reliable services incentivises Transpower to ensure IT systems are robust. Without appropriate controls, checks and balances this could lead to over-engineered solutions as a 'better safe than sorry' approach is taken. The challenge process is a significant tool in ensuring the least-cost objective is achieved but, to be effective, it still requires that the cost inputs to that process are truly least-cost and that those running the process do so with a clear focus on achieving least-cost capital expenditure. To ensure this the challenge process and Business Case template would need to explicitly require robust consideration of whether the least-cost objective is being achieved.

13.4 Review processes

As discussed at *13.2 Transpower Solution Life Cycle* above, there is a regular process of reporting by project teams to the PMO and Steering Committees which review progress against scope, budget and timing. Any issues are highlighted, the level of risk identified, and actions required to resolve it are set out. Larger projects are split into stages and reported on separately. Strategic projects are reported on to the ICTGB.

Close-out reports are done on every project at completion with the exception of straightforward projects conducted by Field Services. Close-out reports are carried out by the Project Team and consider actual performance against budget, scope and milestones and whether any lessons were learned.

We note that Transpower's initial advice, when requested for copies of close-out reports, was that none had been performed as all major projects were still in progress. When it was drawn to Transpower's attention that since July 2006 \$12.4m of projects had been completed, Transpower advised that in fact, a number of close-out reports had been completed.

Transpower has just instituted the post-implementation review process which is to be conducted independently of the Project Team. At this point, no reviews have been completed. The intention is to wait at least 6 months after project completion in order to better gauge whether the intended benefits are being, or are likely to be, captured.

On large IT projects, Transpower extends the project assurance activities to include independent audits. In *Transpower Probity Review Single Source Decision SCADA* (January 2006) PricewaterhouseCoopers reported on its audit of the decision process which decided on a single source for the SCADA Upgrade. PricewaterhouseCoopers were critical of the assumption that, because it was an upgrade, Areva (the incumbent)

were considered by the Project Team as the natural choice. We note that, subsequent to the PricewaterhouseCoopers audit, an assessment of the options was carried out.

Transpower has sought to ensure best practice by implementing two internationally recognised best practice standards against which it is audited:

ITIL

Information Technology Infrastructure Library (ITIL) is a framework of best practice to efficiently manage software, hardware, and human resource services to ensure continued and uninterrupted business.

COBIT

Control Objectives for Information and related Technology (COBIT) is an IT governance framework and supporting toolset that is intended to enable managers to bridge the gap between control requirements, technical issues and business risks. COBIT enables clear policy development and good practice for IT governance throughout organisations.

Comment

Transpower's IT processes are subject to significant internal review processes and, for the larger projects, both internal and external review. The efficacy with which projects are initiated and implemented will have spin-off impacts on the achievement of the least-cost capital expenditure objective. **However, to achieve a significant direct impact on meeting this objective, Transpower will need to explicitly focus these review processes on whether the least-cost objective has been achieved.**

We note our concern that, not being aware that in fact a number of close-out reports had been completed, raises a question about the degree of importance attached to them.

13.5 Electricity Commission approvals

Transpower has some discretion regarding what capital expenditure on IT it seeks approval from the Electricity Commission for, under Part F, and what is subject to a threshold. There may also be discretion on what expenditure is recovered from the Electricity Commission through the system operator service provider contract and what is included in the general IT expenditure that falls under the threshold.

We understand that, the only documentation regarding the process and criteria by which Transpower determines the capital expenditure for which IT will seek EC approval, is a one page high level decision tree chart.

Where replacement capital expenditure includes an element of enhancement, the costs are apportioned on the basis of what the primary driver for the expenditure is. If it is enhancement, then the whole job is classified as enhancement irrespective of whether assets are being replaced. The proposed expenditure is submitted to the Electricity Commission for approval. If the primary driver is replacement, but there is an element of enhancement, then the enhancement element will need to be approved by the Electricity Commission. If it does not approve this, then that component will need to be within the (proposed) Commerce Commission threshold.

Comment

It is beyond the scope of this report to consider the incentives on Transpower to classify capital expenditure as either requiring or not requiring Electricity Commission approval, but we note that there is some room for Transpower to exercise discretion in this. We consider that a review of expenditure that is included under the system operator service provider contract should also be undertaken.

13.6 Competitive tendering processes

A key means by which IT Division endeavours to ensure project costs are genuinely least-cost is through a competitive tender process. We understand Transpower's draft *Rules for Procurement* policy dated 24 November 2006 has now been approved by the Board and governs the contracting process. This policy operates in conjunction with the Contractor Acquisition and Management Policy.

The *Rules for Procurement* policy prescriptively sets out in significant detail the approach to procurement, the content of tender documents, the tender process, the evaluation and award of contracts. As discussed above at *12.5 Procurement Policy*, the *Rules for Procurement* policy sets out (at page 3) that:

“It is a requirement that Transpower's procurement activities deliver goods and services to meet specified minimum performance criteria for the lowest “whole of life” cost, through the use of a transparent, efficient, fair, and auditable set of processes and procedures.”

Transpower has advised that service level outcomes based contracting has been an approach taken in a number of contracts, particularly in the telecommunications and network area. It is likely that more contracts will take this approach going forwards such as the SCADA EMS upgrade.

To a lesser extent, Telecom Ltd has entered into contracts on an “open-book” basis so that Transpower can see, at the time the contract is negotiated, the cost of all project components and the return the contractor is expecting to receive. This can be a particularly useful approach in achieving least-cost capital expenditure when, due to the specialised nature of much of the work and market size limitations, there is often a small number of potential tenderers. It also has potential to be used in single source situations.

In some instances within other divisions, Transpower has adopted an alliancing policy whereby it commits to certain expenditure with a particular provider over an extended period. Given the predominance of discrete projects within IT Division, this is likely to be less appropriate. However, from discussions, it is understood that there may be some opportunity to utilise this approach. The benefit to the contractor is the certainty of revenue over a longer period from which to recoup its investment in equipment and staff training. The commercial value of this to the contractor should enable Transpower to negotiate better pricing.

Comment

We again note that the draft Transpower *Policy for Procurement* was only released on 24 November 2006, which was after the commencement of this review of capital expenditure by Strata.

Whilst it is too soon for this policy to have had a discernable impact, we consider that its provisions establish a very good basis for ensuring the tendering process does result in lowest whole of life cost. We expect that, provided the policy is diligently observed, it will, in the future, have a positive effect in future in achieving the least-cost objective.

However, we consider that simply relying on a tender process is not sufficient to ensure truly competitive price pressure is achieved in instances where there are a limited number of potential tenderers and significant barriers to entry of new providers (market size and specialised skill and equipment requirements).

This situation provides ideal conditions for contractors to share price-sensitive information with each other and engage in anti-competitive practices. While Strata has no evidence of such behaviour, it considers the opportunity certainly exists and the behaviour would be hard to detect.

We consider that Transpower would benefit from pursuing opportunities to use a range of different types of contracting arrangements which potentially provide additional leverage which can be used to ensure the least-cost objective is achieved. These contracting arrangements include:

- 'open-book' contracts under which the financial return to the contractor is disclosed at the time a contract is negotiated and which forms a factual background against which the contract is negotiated;
- contracts negotiated on required service level basis where the contracted deliverable is a set of outcomes rather than a particular application or item of hardware; and
- partnering/alliancing arrangements.

We consider that Transpower would need to have a clear view of the benefits it would expect or seek from such arrangements, in particular the opportunity to ensure that the least-cost objective is achieved.

14. Measurement & Performance

14.1 IT capital expenditure trends

The table below sets out capital expenditure on the categories of IT expenditure which will be subject to any agreement regarding thresholds. It is Transpower's intention that certain services required for the Telecommunications Upgrade will be leased. We note that these costs are not reflected in the table below.

Capital Expenditure on IT FY04/05 to 08/09

Transpower Capital Expenditure on IT					
Capital Expenditure on IT which is to be subject to a threshold (not adjusted for inflation)	2004/05 Actual	2005/06 Actual	2006/07 Budget	2007/08 Forecast	2008/09 Forecast
Telecommunications (major replacement)	3,963,379	4,618,200	11,221,470	46,085,000	23,400,000
SCADA EMS & RTU Protocol (major replacement)					
SCADA RTU Protocol	0	0	0	3,000,000	3,000,000
SCADA EMS	110,140	2,366,106	11,925,000	0	0
SCADA EMS & RTU Protocol Total	110,140	2,366,106	11,925,000	3,000,000	3,000,000
Network Systems Refurbishment & Replacement					
- Asset Management Systems	2,393,072	1,442,937	1,770,000	3,700,000	5,500,000
- Real Time & Stations	923,228	1,039,411	3,804,000	3,870,000	2,190,000
Network Systems R&R Total	3,316,300	2,482,348	5,574,000	7,570,000	7,690,000
Total	7,389,819	9,466,654	28,720,470	56,655,000	34,090,000

The table shows a dramatic increase in capital expenditure across all categories from the FY04/05 onwards. This largely reflects the impact of the work programme set out in the ISSP which was based on an analysis of the current state of Transpower IT, the business drivers and the key priorities (for a fuller discussion see *12.4.4 Information Systems Strategic Plan* above). Also influential is the Telecommunications & Networking Strategy Review completed in April 2005.

Since the commencement of Strata's review of capital expenditure on IT, some adjustments have been made to Transpower's October 2006 Business Plan figures for FY 06/07, 07/08 and 08/09. Figures provided at the commencement of the review reflected capital expenditure of \$128m over the three years compared with a total of \$119m now. We understand this 7% reduction primarily reflects a shift in respect of some components of the Telecommunications Upgrade from an intention to purchase outright to entering into a lease.

14.2 Project cost estimates

We have compared how the actual costs of projects compared with budget. Of the 60 projects completed since July 2006, the vast majority cost less than budget. In total, the actual capital expenditure was \$12.4m compared with a budget of \$15.7m, 21.5% under budget. Only seven projects ran over budget and then only to the combined extent of \$51,000.

To compare Concept document cost estimates with Business Case and actual costs, it was necessary to select a sample of Concept documents because Transpower does not collate data for Concept document cost estimates. A sample of seven of the larger projects showed that the Concept document estimate and the Actual Cost were very closely aligned (within 4% of each other). The business case projects costs were 21% higher than actual costs.

Comment

The 21.5% difference between Business Case cost and actual costs very closely reflects the standard 10% contingency and 10% management reserve added to the

base cost. These results indicate a good level of accuracy in the Business Case cost estimates. This is not surprising given the requirement that a firm price, usually obtained through an open tender process, is required for any project in excess of \$200,000 before a Business Case could be passed for approval.

The challenge processes, including the monthly review of project costs (whether approved or not), also appears to be effective in refining the cost estimates in Concept documents.

We would have expected that as part of the process of improving the accuracy of cost-estimation and monitoring the performance of the challenge process that Transpower would collect and compare data on costs in the Concept and Business Case documents with actual costs.

15. Best Practice

In addition to our review of the policies procedures and practices Transpower has applied, consideration was also given to what would constitute best practice to ensure I.T. capital expenditure was least-cost. Set out below is our view of what would constitute best practice and a comment on whether Transpower conforms:

- Policy settings which clearly set out the least-cost objective (and any limitations or balancing factors) and which are not constrained or compromised by other objectives.

Transpower conforms.

- A focus at Board and Executive level on achieving the least-cost objective and measuring and reporting on progress. It may be possible to set specific savings targets in relation to repeat capital expenditure.

It appears that costs at the concept document, business case and actual project costs are not aggregated and assessed as a matter of course. We would have expected to see this analysis to monitor the effectiveness of the cost estimation, challenge and contracting processes. We do not consider the Capital Spend KPI or the Balanced Scorecard measures to be effective in achieving the least-cost objective.

- A consistent focus at all levels throughout Transpower on minimising capital expenditure.

Transpower's corporate policy document Rules for Procurement clearly articulates the least-cost objective and sets out effective measures relating to the procurement process to achieve it. A consistent focus on the least-cost objective and close observance of this policy will improve the prospects of achieving it. In our view, the focus on achieving least-cost could still be strengthened further.

- Assignment of responsibility to a particular group or position within Transpower for ensuring an appropriate focus on cost containment in the capital expenditure process and for reporting appropriately on it.

The Business Services Manager is tasked with reviewing and signing off the each business case for capital expenditure however Strata questions whether this position would have sufficient time available to bring adequate focus on to least-cost capital expenditure

- Procedures and processes which ensure:
 - the need for expenditure is correctly identified;
 - the most cost-effective solution is selected, including whether to replace or refurbish. Note this is not the same as achieving least-cost expenditure because, even after selecting an appropriate technical solution, it is essential the policies, processes and practices governing solution specification, cost estimation, tendering, contracting, project / contact management are optimal;
 - . ;

- the lowest possible cost is consistently and correctly determined;
- the full range of relevant factors are considered (including asset condition assessments, best practice, environmental conditions, future plans and scenarios); and
- timing of the works is optimised.

We consider that Transpower performs well in achieving these but note that a risks exists that IT will overspend to achieve a high degree of certainty regarding the provision of IT services (particularly key services).

- Appropriate controls, checks and balances throughout the entire capital expenditure process to ensure cost-benefits are properly assessed on the basis of least-cost data and are taken account of in asset management decision making.

The framework established as a result of the restructuring and realignment process which occurred in 2004 and the subsequent steps to improve processes provide a good basis for Transpower to achieve the least cost capital expenditure. However, we consider a requirement that this issue is explicitly addressed in the procurement process would be beneficial.

- A rigorous internal challenge process which can effectively challenge on price. Ideally (setting aside other considerations) this process should be 'owned' by a structurally separate group within Transpower from that which is responsible for maintaining and managing the Grid.

It appears that the internal challenge process currently has a reasonable degree of rigour. However, we feel that the reduction of forecast capital expenditure for the 2006/07 year from \$120m down to \$83 m was likely to at least be partly due to project delays, rather than the success of the challenge process.

- A regular independent external audit of a sample of projects

While IT Division does use external parties to audit aspects of its projects we are not aware of any such audits having a specific focus on assessing the effectiveness in achieving least-cost capital expenditure.

- Procedures and processes which maximise competition in the tendering and letting of contracts. These should take into account:
 - the highly specialised and skilled nature of much of the work;
 - the often limited pool of providers of such services; and
 - Transpower's position as a major purchaser of such services.

As discussed, our view is that arrangements such as alliancing, outcome based and open-book contracting should continue to be explored and exploited, not just to better achieve the desired service level but also as a tool to best ensure the least-cost objective is achieved.

- Effective processes to ensure continuous improvement in the accuracy of forecasting and lessons learned in relation to achieving least-cost capital expenditure.

The close-out report and newly instituted post-implementation review processes should go some way to ensuring that learning is captured and performance assessed. The effectiveness of this would, in our view, be improved if there was a specific requirement to address the least-cost capital expenditure objective in each of these processes.

As discussed at 13.4 Review Processes Transpower has implemented two internationally recognised best practice standards

ITIL

Information Technology Infrastructure Library (ITIL) is a framework of best practices to efficiently manage software, hardware, and human resource services to ensure continued and uninterrupted business.

COBIT

Control Objectives for Information and related Technology (COBIT) is an IT governance framework and supporting toolset that is intended to enable managers to bridge the gap between control requirements, technical issues and business risks. COBIT intended to enable clear policy development and good practice for IT governance.

16. Potential efficiency and cost reduction gains

Efficiencies and cost reduction gains can be expected from:

- A continued focus at Board and Executive level on the effective implementation of the least-cost objective, including setting specific targets in relation to capital expenditure and measuring and reporting on progress. These targets, measurements and reporting regimes would include targeted capital expenditure savings, monitoring Concept document cost estimates vs approved Business Case capital expenditure costs vs actual costs), and reporting on the impact of cost containment measures;
- Establishing additional controls, checks and balances throughout the entire capital expenditure management process. This is particularly important given the level of focus on systems reliability and performance levels. Proposers and approvers of projects alike could be required satisfy themselves the least-cost capital expenditure objective has been met;
- A regular independent external audit of a sample of projects could be conducted with a specific focus on whether the least-cost objective was achieved;
- Further exploration of the use of different contracting arrangements (outcomes based, open-book and alliancing) with a focus not only on ensuring the project performance criteria are met, but also as a means of ensuring the least-cost capital expenditure objective is achieved;

17. Reasonableness of projects and project costs

A number of factors need to be considered in relation to determining the reasonableness of the proposed threshold figures for 06/07, 07/08 and 08/09:

- the expenditure thresholds relate to actual costs and not to cost estimates which include contingencies, i.e. the threshold amount will operate as an amount which actual expenditure may reach, but not exceed. Therefore, we consider the budgeted and forecast capital expenditure levels established by Transpower are not appropriate for consideration as a threshold but should be adjusted downwards because the data on which they are based includes contingency sums. The data from the 60 projects completed since 1 July 2006 indicates that IT Division, on average, does not use its contingencies at all and, in fact, comes in slightly under budget. We consider that a 12.5% downward adjustment to the budgeted expenditure, to adjust for the contingency component, would be appropriate when setting thresholds. This level of adjustment reflects the fact that contingencies and reserves usually represent a total loading of 20% on top of the base cost;
- if Transpower does take steps to improve its performance to reduce capital expenditure these will take time to implement and derive a benefit. There is some prospect of impacting the 07/08 year but the full impact of the any measures taken is unlikely to be felt until 08/09; and
- in our view, it should be possible for Transpower to achieve a minimum reduction of 2.5% within 18 months, i.e. by the commencement of the 2008/2009 financial year. This is a subjective view based on the gains we would expect to be achieved if Transpower were to implement best practice measures not presently applied. It is difficult to precisely quantify the achievable reduction in capital expenditure levels because the focus of the study has been on the appropriateness of policies, processes and practices rather than on reviewing individual projects (which time would not permit). However, in our view, some reduction is justified. In an endeavour to under, rather than over-adjust the proposed levels, we have taken the approach of estimating the minimum reduction possible.

On this basis, a downward adjustment of 15.0% (i.e. 12.5% adjustment for contingency plus 2.5% adjustment for potential efficiency gains) from the budgeted expenditure in each of the three years would be appropriate in establishing thresholds. This should be applied to inflation- adjusted figures in the second and third years. We note that an overall downward adjustment of 15% would result in a threshold for each year equivalent to the forecast base cost of projects plus a contingency of 2%. This is calculated on the basis the proposed adjustment is applied to the entire budgeted and forecast expenditure, including the contingency sums.

Despite the greater effectiveness of the practices and processes which impact on achieving least-cost capital expenditure on IT, the proposed downward adjustment is higher than for refurbishment, replacement and enhancement capital expenditure primarily because the average level of contingencies is higher. A greater downward

adjustment to IT capital expenditure is therefore required to reduce the contingency component to a relatively low level.

Section III: Summary and Conclusions

18. Conclusions for Asset Replacement, Refurbishment and Enhancement

Whilst the least-cost objective is embodied in a range of policy and procedural documents, we consider that, in practice, Transpower is not strongly focused on achieving this objective and its current capital expenditure management processes could be improved in that respect. We reached these conclusions primarily on the basis of our views that:

- the internal challenge process, with respect to achieving least-cost replacement, refurbishment and enhancement capital expenditure, is relatively weak;
- the project tendering process is not particularly competitive and creates a situation which may encourage tenderers to act in an anti-competitive manner;
- it is necessary for Transpower to take steps that ensure the close observance of the recently introduced *Rules for Procurement* corporate policy;
- Transpower's focus on achieving the least-cost objective is not strong;
- Transpower takes a cautious approach to capital expenditure as a result of the high importance attached to ensuring the security of supply. This is entirely appropriate given the importance of a reliable electricity supply. However, with such a strong bias towards security there is a risk of over-spending and going beyond the requirements of the Grid Reliability Standards; and
- the accuracy of project cost data is in question, particularly the correct categorisation of capital expenditure and the accuracy of estimates.

We consider that Transpower's performance in achieving its least-cost objective could be improved through implementing a range of measures and changes in approach including:

- instituting a more rigorous challenge process with respect to project costs;
- setting cost reduction targets and better monitoring performance with regard to managing replacement, refurbishment and enhancement capital expenditure and in achieving the least-cost objective;
- establishing an open-book process of negotiating project costs under longer-term alliancing agreements;
- improving the accuracy of the cost-estimation process; and
- raising the focus throughout Transpower on achieving the least-cost objective.

We therefore consider it would be appropriate, if using Transpower's budgeted and forecast capital expenditure as a basis to establish a threshold on Information Technology capital expenditure, for each of the three years to be adjusted downwards. In determining the extent of the adjustment appropriate to each year, the following factors should be taken into account:

- in our view, it should be possible for Transpower to achieve a minimum reduction through efficiency gains of 5% within 18 months i.e. by the middle of the 2008/2009 financial year. This is a subjective view based on the gains we would expect to be achieved if Transpower were to implement best practice measures not presently applied. It is difficult to quantify precisely the achievable reduction in capital expenditure levels because the focus of the study has been on the appropriateness of policies, processes and practices rather than on reviewing individual projects (which time would not permit). In our view, some reduction is clearly justified and, in an endeavour to under-adjust rather than over-adjust, we have taken the approach of estimating the minimum reduction possible. We consider this a conservative adjustment and expect that greater gains are possible if Transpower was to implement measures focussed on achieving least-cost capital expenditure. It should be noted that Transpower has provided comment that a 5% reduction in tower painting costs should be achievable through contracting over a longer term
- Transpower has recently provided updated data for replacement, refurbishment and enhancement capital expenditure which reflects an increase in the total value of projects over three years by \$20m. This, together with a reallocation between the years, has resulted in Year Three increasing by more than 50% from \$61m to \$92m. As a consequence of the scale of the changes in Year Three (2008/09) Strata does not consider it appropriate for the data to be used as a basis for establishing a threshold without a detailed reconciliation and investigation into the changes to identify the extent to which the figures require adjustment
- Transpower has advised that, while replacement, refurbishment and enhancement projects are sometimes approved on a basis which includes contingencies, such contingencies are excluded from budgeted and forecast capital expenditure. Consequently no adjustment for contingencies is required. If they had been included it would be appropriate to reduce contingencies down to a minimal level because, in Strata's view, the threshold should exclude contingencies so as to reflect the actual expected level of expenditure.

On this basis, a downward adjustment of 5% in each of the three years would be appropriate. This should be applied to inflation- adjusted figures in the second and third years.

In summary, we conclude that for asset replacement refurbishment and enhancement capital expenditure, the budgeted and forecast capital expenditure figures overstate appropriate threshold levels by 5%, and possibly more, and accordingly should be adjusted downwards.

19. Conclusions for Information Technology Expenditure

A number of factors combine to provide an environment favourable to Transpower achieving the objective of least- cost capital expenditure on IT:

- a strong strategic and governance framework;
- a focused and well integrated approach to initiating and evaluating projects which arose out of the restructuring and realignment processes commenced in 2003/04
- disciplined, standardised project management processes, which again arose from the restructuring and realignment processes;
- relatively strong internal challenge processes;
- the requirement to obtain a firm price before a Business Case can be submitted for approval;
- the new *Rules for Procurement* policy which, in time, will improve the management of capital expenditure, provided the policy is closely observed

Whilst these factors are conducive to achieving least-cost capital expenditure, we consider Transpower's performance in achieving its least-cost objective could be improved through implementing a range of measures and changes in approach including:

- generally raising the focus throughout Transpower on achieving the least-cost objective;
- taking steps to ensure the close observance of the recently introduced *Rules for Procurement* corporate policy;
- introducing provisions into process and policy documentation requiring that, throughout the process of initiating, evaluating and implementing projects, the achievement of least-cost capital expenditure objective is explicitly considered and that the steps being taken (or intended to be taken) to achieve it are set out;
- requiring that supporting and approving signatories to documentation approving capital expenditure satisfy themselves that all reasonable steps to achieve least-cost capital expenditure have been taken;
- setting capital expenditure cost reduction targets (at least for repeat replacement, refurbishment and enhancement capital expenditure);
- better monitoring and measurement of performance in managing capital expenditure on IT (including the comparison of cost estimates with actual costs and developing better KPI/Balanced Scorecard measures);
- investigating further the opportunities to utilise certain contracting practices (open-book, outcomes-based and alliancing) to deliver, not only the required project outcomes, but also least-cost capital expenditure;

We therefore consider it would be appropriate, if using Transpower's budgeted and forecast capital expenditure as a basis to establish a threshold on Information Technology capital expenditure, for each of the three years to be adjusted downwards. In determining the extent of the adjustment appropriate to each year, the following factors should be taken into account:

- the expenditure thresholds relate to actual costs and not to cost estimates which include contingencies, i.e. the threshold amount will operate as an amount which actual expenditure may reach, but not exceed. Therefore, we consider the budgeted and forecast capital expenditure levels established by Transpower are not appropriate for consideration as a threshold but should be adjusted downwards because the data on which they are based includes contingency sums. The data from the 60 projects completed since 1 July 2006 indicates that IT Division, on average, does not use its contingencies at all and, in fact, comes in slightly under budget. We consider that a 12.5% downward adjustment to the budgeted expenditure, to adjust for the contingency component, would be appropriate when setting thresholds. This level of adjustment reflects the fact that contingencies and reserves usually represent a total loading of 20% on top of the base cost;
- if Transpower does take steps to improve its performance to reduce capital expenditure these will take time to implement and derive a benefit. There is some prospect of impacting the 07/08 year but the full impact of the any measures taken is unlikely to be felt until 08/09; and
- in our view, it should be possible for Transpower to achieve a minimum reduction of 2.5% within 18 months, i.e. by the commencement of the 2008/2009 financial year. This is a subjective view based on the gains we would expect to be achieved if Transpower were to implement best practice measures not presently applied. It is difficult to precisely quantify the achievable reduction in capital expenditure levels because the focus of the study has been on the appropriateness of policies, processes and practices rather than on reviewing individual projects (which time would not permit). However, in our view, some reduction is justified. In an endeavour to under, rather than over-adjust the proposed levels, we have taken the approach of estimating the minimum reduction possible.

On this basis, a downward adjustment of 15.0% (i.e. 12.5% adjustment for contingency plus 2.5% adjustment for potential efficiency gains) from the budgeted expenditure in each of the three years would be appropriate in establishing thresholds. This should be applied to inflation- adjusted figures in the second and third years. We note that an overall downward adjustment of 15% would result in thresholds for each year equivalent to the forecast base cost of projects plus a contingency of 2%. This is calculated on the basis the proposed adjustment is applied to the entire budgeted and forecast expenditure, including the contingency sums.

Despite the greater effectiveness of the practices and processes which impact on achieving least-cost capital expenditure on IT, the proposed downward adjustment is higher than for refurbishment, replacement and enhancement capital expenditure primarily because the average level of contingencies is higher. A greater downward adjustment to IT capital expenditure is therefore required to reduce the contingency component to a relatively low level.

In summary, we conclude that the budgeted and forecast capital expenditure on Information Technology overstate appropriate threshold levels by 15%, and possibly more, and accordingly should be adjusted downwards.