Electricity Transmission Revised Proposal

2008/09 – 2013/14

SP AusNet™
A member of Singapore Power Group

About SP AusNet

SP AusNet is a major energy network business that owns and operates key regulated electricity transmission and electricity and gas distribution assets located in Victoria, Australia. These assets include:

- A 6,574 kilometre electricity transmission network indirectly servicing all electricity consumers across Victoria;
- An electricity distribution network delivering electricity to approximately 580,000 customer supply points in an area of more than 80,000 square kilometres of eastern Victoria; and
- A gas distribution network delivering gas to approximately 510,000 customer supply points in an area of more than 60,000 square kilometres in central and western Victoria.

SP AusNet's vision and mission are to be the best networks business delivering energy and associated services safely, reliably, responsibly and efficiently. The SP AusNet company values are:

- Commitment to the highest standards of service and performance when creating value for customers, the public, employees and shareholders
- Integrity to act with honesty and to practise the highest ethical standards
- Passion to take pride and ownership in all that we do
- Teamwork, to support, respect and trust each other, with continual learning through sharing of ideas and knowledge

The Victorian electricity transmission network is a key strategic asset servicing Australia's second largest economy and the National Electricity Market (NEM). The network serves in excess of 1.8 million households and 280,000 businesses transferring over 45 million megawatt hours of energy annually.

For more information visit: www.sp-ausnet.com.au

Contact

This document is the responsibility of the Regulatory and Business Strategy Division, SP AusNet. Please contact the officer below with any inquiries.

Thomas Hallam
Manager Transmission Regulation
SP AusNet
Level 31, 2 Southbank Boulevard
Melbourne Victoria 3006
Ph: (03) 9695 6000

Table of Contents

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

1 Executive Summary

1.1 SP AusNet's revised Revenue Proposal

SP AusNet is pleased to provide the Australian Energy Regulator (AER) and its diverse stakeholders, with details of its plans and its revised Revenue Proposal for the six-year period 2008 / 09 – 2013 / 14. This executive summary provides a brief overview of SP AusNet's revised Revenue Proposal.

The revised Revenue Proposal is submitted in accordance with Clause 6A.12.3(a) of the National Electricity Rules (NER). It follows the earlier publication of SP AusNet's original Revenue Proposal[1] and the AER's subsequent Draft Decision[2]. This revised Revenue Proposal reflects SP AusNet's long-term business plan and also responds to the AER's Draft Decision.

This Revenue Proposal delivers

- **High network reliability meeting customers' expectations**
- **Sustainable network condition**
- **Substantial capital investment**
- **Competitive prices**

SP AusNet is committed to the sustainable and long-term delivery of the service and operational outcomes described in this Revenue Proposal on the basis of the acceptance of the overall proposal by the AER.

It is SP AusNet's view that over the coming six years, high levels of service and relatively low pricing should continue; even in the face of significant network challenges that call for major increases in the level of capital expenditure.

The Victorian public and the wider national electricity market have been well served by SP AusNet's transmission infrastructure over the past five years. Backed by our asset management capabilities, high standards of service have been provided at relatively low prices by Australian and indeed international standards.

However, going forward it is the judgment of SP AusNet that the transmission system faces new ongoing challenges. Even with outstanding asset management practices, the fact remains many of our assets are old and due for replacement. Over the last decade, economic growth and changes in demand patterns have eliminated much of the spare capacity that had been created. And the public, as recent bushfire-related outages has reinforced, hold high expectations of continuous electricity supply.

In response to these challenges SP AusNet has a plan that includes a substantial increase in the level of capital expenditure; a program totalling more than $934 million ($838 million in

[1] SP AusNet, Electricity Transmission Revenue Proposal, 2008/09 – 2013/14, 28 February 2007.
[2] Australian Energy Regulator, SP AusNet Transmission Determination, Draft Decision, 31August 2007.

2007 / 08 dollars) over the six-year period. Despite the increase we have proposed only minor increases in pricing levels beyond inflation.

SP AusNet has confidence in the AER and the current regulatory regime, despite the risks inherent in the longer determination duration. The SP AusNet Board is supportive of the plans for reinvestment. They expect the integrity of the assets to be maintained, to ensure long-term sustainable performance.

We request that the AER, and other stakeholders, support our plans and our pricing proposals for the transmission network.

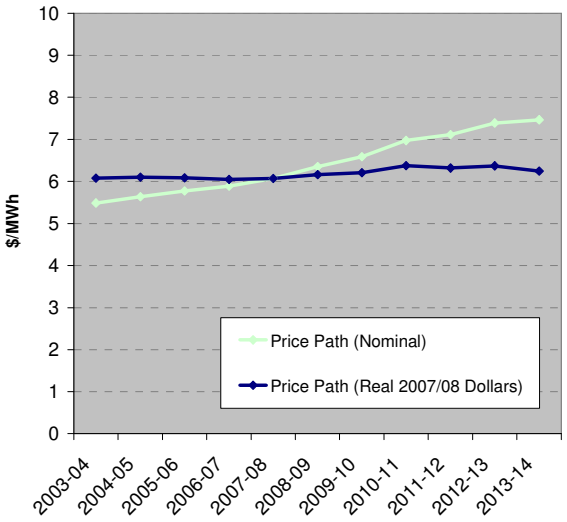
1.2 Future Price Trends

SP AusNet has the lowest charges for electricity transmission services in Australia.

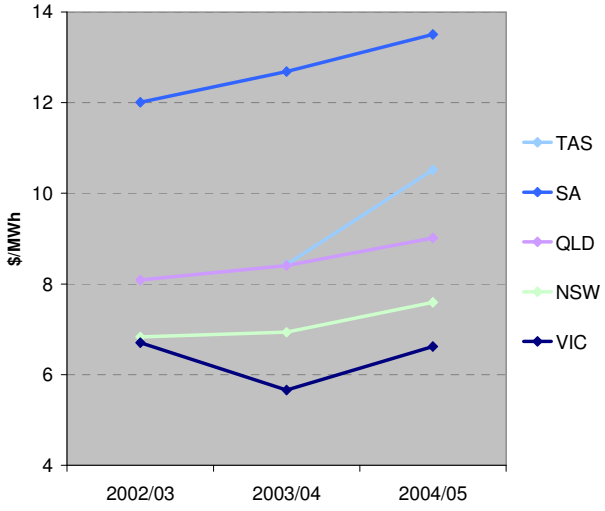
The revenue path outlined in this revised Revenue Proposal will continue to deliver low charges to Victorian customers and ensure that the reliability and performance of the network is continually improved. It should also be noted that the proposed price path also reflects SP AusNet's careful consideration of the matters raised by the AER in its Draft Decision. Figure 1.2 illustrates the proposed price path.

Figure 1.2: Future Price Path and Existing Transmission Charges

Forecast Transmission Price Path*



Transmission Charge 2002 / 03 to 2004 / 05



* Effects of the Victorian easement land tax and the roll-in of previously unregulated assets are excluded to allow a like-for-like comparison over time.

Source: SP AusNet, AER TNSP Comparison Reports.

1.3 Network Reliability

SP AusNet provides its customers with the most reliable and cost effective transmission service in the National Electricity Market (measured in system minutes off supply). The revised proposal outlined in this submission ensures that this level of performance is maintained, and that where possible, further enhancement is provided. SP AusNet remains committed to ensuring that high levels of reliability are maintained.

The Victorian transmission network is a mature network with a significant number of assets approaching their maximum expected life. SP AusNet monitors the condition of these ageing assets and models their replacement requirements in order to limit asset failure risk to within an

acceptable band. This modelling demonstrates the requirement for an increased level of investment for the replacement of assets in the forthcoming regulatory period. The proposed investment builds on the already substantial increase in investment achieved during the current regulatory period.

Since the start of 2003, SP AusNet has invested $472 million ($497 million in 2007 / 08 dollars) to maintain the network's performance at the high levels required. This was an increase of over 180 percent on the average level of expenditure on the transmission network during the previous decade as excess capacity, built when under government ownership, became fully utilised.

1.4 Service Standards Proposals

SP AusNet has delivered large benefits to customers by increasing availability of plant during peak summer periods when market constraints and increased costs to consumers are most likely to occur. This performance has been driven by the existing service standard scheme, combined with the availability incentive scheme agreed with SP AusNet's largest customer, VENCorp.

As requested by the AER, SP AusNet is proposing new service standards to make them consistent with the rest of the National Electricity Market (NEM). The new proposal will entrench the benefits that customers already enjoy, achieved through ensuring a high level of transmission equipment availability in peak periods, while providing sufficient levels of access to the network in off-peak and intermediate periods, to allow the necessary construction and maintenance activities to be carried out. The benchmarks have been revised to reflect actual results and the planned works program.

The revised proposed service standards will provide the necessary linkage between performance measures and responsibilities, with incentives that will produce the desirable outcomes that the AER is seeking. These include:

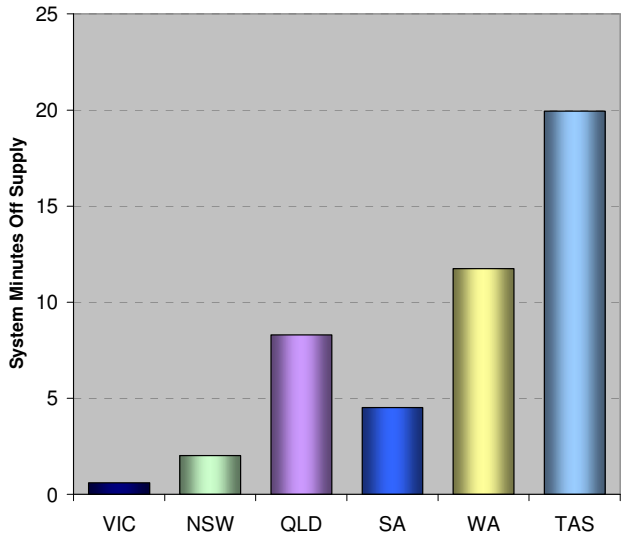
- being linked closely to actions which are controllable by the Transmission Network Service Providers;
- broadly reflecting desirable market and end-user outcomes;
- encouraging flexibility to modify outages in response to changing or unexpected events; and
- rewarding improved performance while penalising poor performance.

It should also be noted that the revised proposed service standards also reflects SP AusNet's careful consideration of the matters raised by the AER in its Draft Decision.

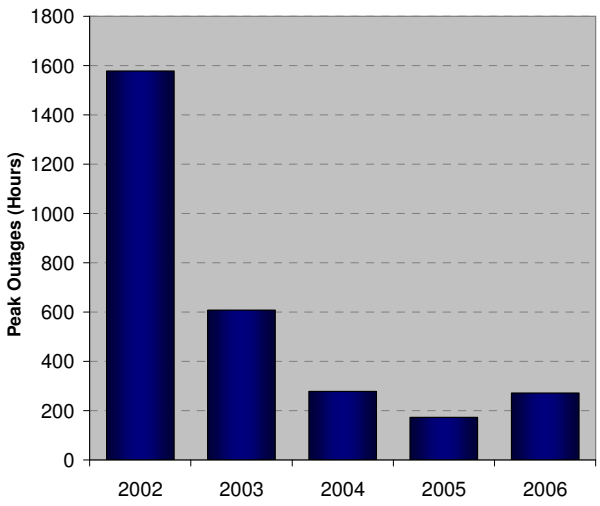
Figure 1.4 below illustrates the performance improvements achieved by SP AusNet over the current regulatory period, and the superior reliability of the Victorian transmission network.

Figure 1.4: Reliability and Availability

System Minutes Lost 1999/00 to 2004/05 (average per annum)



Peak Period Outages, SP AusNet, 2002 to 2006 (per annum)



Source: ESAA, SP AusNet.

1.5 Efficient Asset Management and Performance

The asset-related expenditure needs for the next regulatory period form a key component of this Revenue Proposal. It should be noted that SP AusNet's expenditure plans cover only the replacement capital expenditure requirements and existing regulated networks' operating expenditure, as SP AusNet does not plan augmentation of the transmission network.

SP AusNet's objective is to continue to provide transmission services in an efficient, safe, reliable and secure manner for its customers and the national electricity market, while complying with its other statutory obligations (such as environmental legislation).

As can be seen from the successful delivery of the expenditure program from the previous regulatory period, SP AusNet takes its capital expenditure program very seriously and it is an integral part of our business plan and performance objectives.

Accordingly, SP AusNet's Asset Management Strategy has been significantly enhanced to support the delivery of the following key outcomes for the customers of the Victorian Transmission Network:

- maintaining a stable and sustainable network asset failure risk profile to ensure the maintenance of supply reliability in accordance with customers' needs and preferences;
- meeting operational performance targets for network reliability and availability;
- complying both with occupational health and safety (OH&S), environmental and security legislation, codes and regulations and with operational codes and regulations; and
- optimising total capital, operating and maintenance costs over the asset life cycle.

To produce these outcomes, the asset management strategy facilitates SP AusNet's efficient management of the single most significant challenge in controlling risk and maintaining performance levels – the asset failure risk associated with the ageing of Victoria's transmission network. The asset management strategy also highlights the assets that require replacement before failures occur, based on a rigorous risk and asset condition assessment process, which identifies key asset replacement or maintenance needs.

Asset replacement is the largest single factor driving the nature and cost of the proposed expenditure plans.

SP AusNet's best-practice asset management processes enable the company to perform extremely well in terms of capital expenditure delivery and operational efficiency. Indeed, the efficiency and robustness of the company's Asset Management Strategy and related processes have been recently confirmed, through an independent review of risk management processes by Jervis Consulting[3].

SP AusNet's innovative asset management processes have enabled the company to deliver its planned capital program over the 2003 – 2007 / 08 regulatory control period within 9 percent of the allowance set at the last revenue cap review, despite a number of unanticipated major works. This assists to demonstrate the capital expenditure over the current regulatory period has been prudent and efficient.

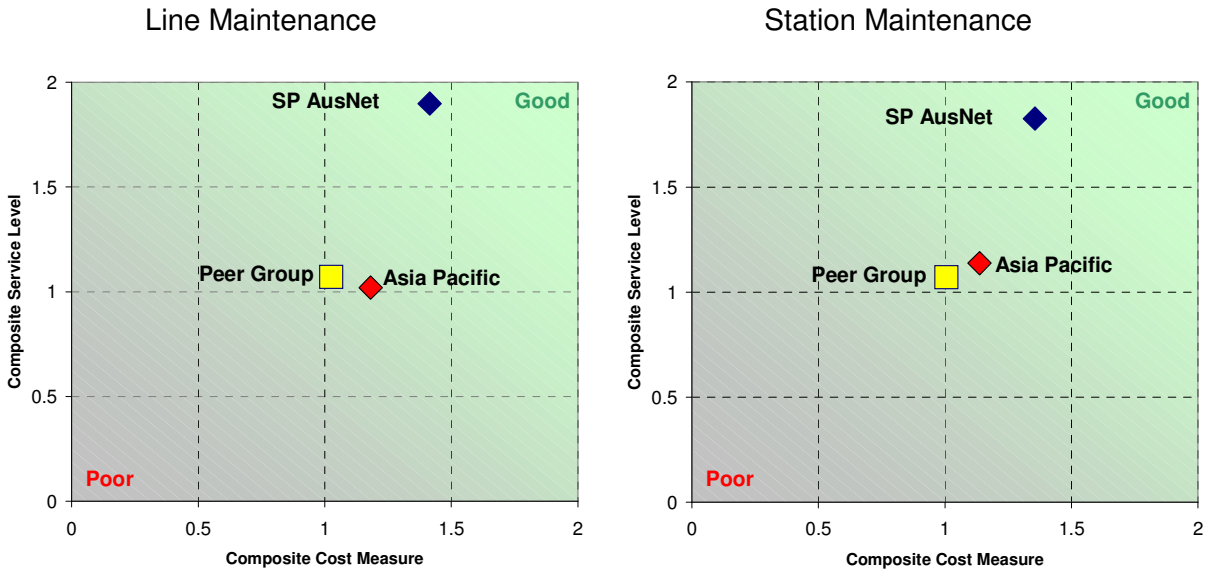
Looking forward to the forthcoming regulatory period, the Asset Management Strategy will continue to provide an effective framework to facilitate the efficient delivery by SP AusNet of a safe, reliable and secure network for customers, while also ensuring compliance with all statutory obligations.

[3] Jervis Consulting Report (Appendix A)

Benchmarking studies confirm that SP AusNet's operational effectiveness places the company at the forefront of the transmission sector in Australia and the world. SP AusNet participated in the latest round of international benchmarking – International Transmission Operations and Maintenance Study (ITOMS 2005). The results of this study indicate that SP AusNet remains one of the most cost-efficient transmission entities.

Figure 1.5 favourably compares SP AusNet's performance with the averages of international peers (companies with similar asset profiles to SP AusNet) and Asia Pacific peers (including Australia and New Zealand) in transmission line maintenance and station related maintenance.

Figure 1.5: Benchmarking



Source: ITOMS 2005 Report

SP AusNet's strong performance provides further substantiation of the prudency and efficiency of SP AusNet's asset management processes, and its work delivery processes.

1.6 Capital Expenditure Requirements

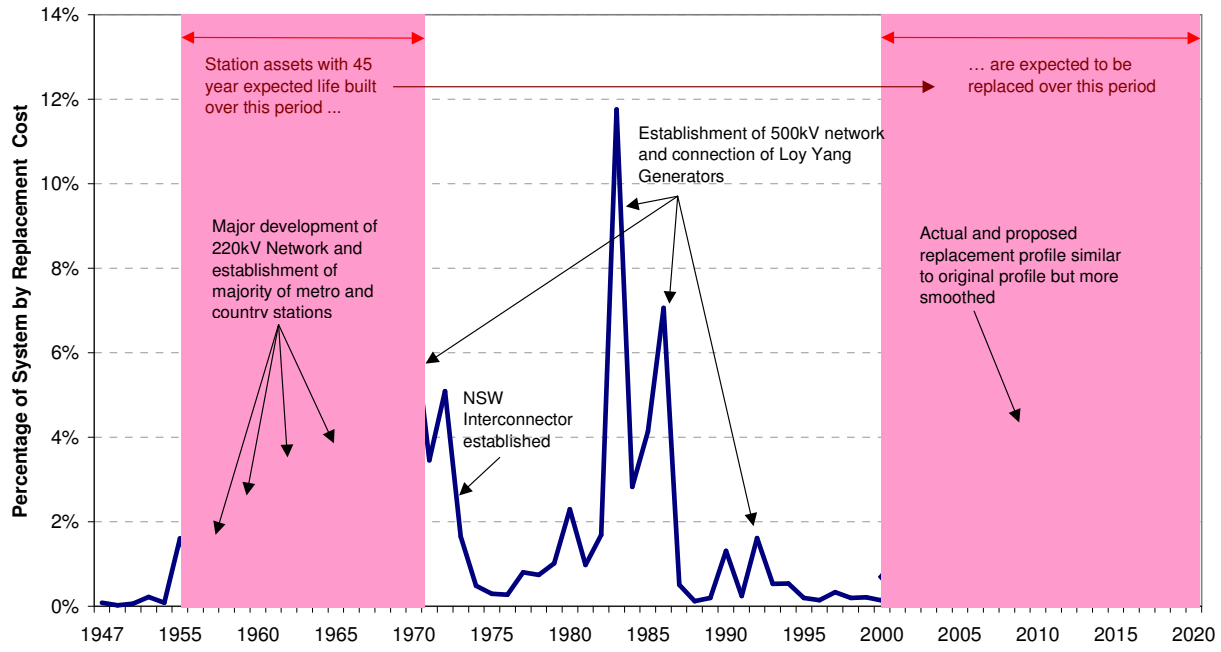
The capital expenditure program in this revised Revenue Proposal is predominately based on the replacement of existing assets as their condition or performance deteriorates, to ensure the ongoing reliability and security of the transmission network.

The majority of SP AusNet's 220 kV system and associated 22 kV and 66 kV connection assets at terminal stations were built between 1955 and 1970. Primary Terminal Station assets are expected to last 45 years on average, with a range between 40 - 50 years, depending on the actual condition of the asset.

SP AusNet does not simply replace like with like, but coordinates and integrates asset replacement with augmentation and customer initiated proposals. This is to ensure capital expenditure to meet demand forecasts is optimised.

Figure 1.6 highlights the increasing need for the replacement of aged and unreliable assets based on the initial service dates of the key transmission stations and lines that make up the Victorian transmission network.

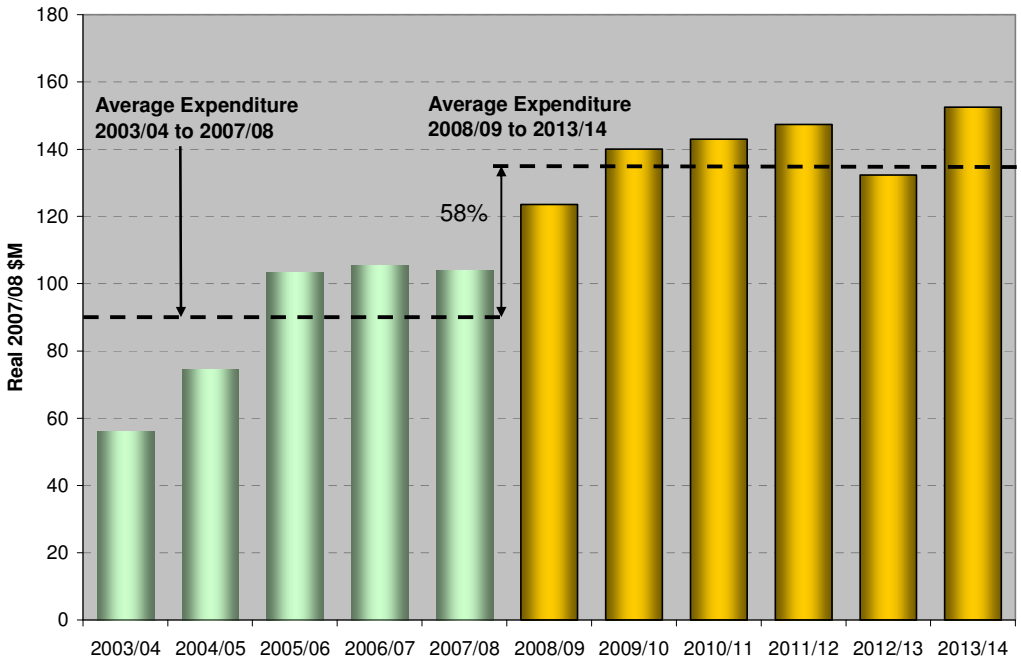
Figure 1.6.1 Relationship Between System Development and Replacement



Source: SP AusNet

The proposed non-augmentation capital expenditure program represents a 58 percent real increase in the capital program for the period 2008 / 09 to 2013 / 14 (refer Figure 1.6.2).

Figure 1.6.2 Non-Augmentation Capital Expenditure 2003/04 to 2013/14 (Real 2007/08 $m)



* Actual to 2006/07, forecast to 2013/14.

Note: Capital expenditure as commissioned (6 months IDC excluded)

Source: SP AusNet

Additional factors driving the increase in capital expenditure in the forthcoming regulatory control period include:

- more difficult and complex rebuilding work at confined city sites, where supply must be fully maintained throughout the renewal work, and conversion to more expensive compact gas-insulated switchgear to allow room for asset expansion at these confined sites to meet future demand;
- a substantial increase in the number of transformers being replaced over the period, which will rise from 12 to 40; and
- more demanding safety, environmental and security requirements. Consumer, workforce and public expectations in each of these areas continue to reflect higher standards, requiring utilities to provide additional facilities to meet these requirements.
- high material and equipment costs associated with increased commodity prices and increasing demand pressures from worldwide infrastructure investment; and
- strong competition for skilled labour associated with the substantial growth in infrastructure and resource development in Australia.

The revised proposed capital expenditure (capex) program for the forthcoming regulatory period continues and builds on the successfully completed capex program for the current regulatory control period. In fact, the company's previous revenue cap application in 2002 clearly foreshadowed the need for increasing levels of capital expenditure in future regulatory periods.

Representing an optimal balance of the costs of asset replacement and maintenance on one hand, and the risk and costs of deteriorating reliability and asset performance on the other, the capital expenditure program is aimed at ensuring the ongoing maintenance of network reliability and service in accordance with customers' needs, whilst minimising the total life cycle cost of service. It should also be noted that the revised capital expenditure proposal reflects SP AusNet's careful consideration of the matters raised by the AER in its Draft Decision.

1.7 Operating Expenditure Requirements

SP AusNet has delivered considerable efficiency savings during the current regulatory period, which will flow to consumers during the forthcoming period. SP AusNet's operating expenditure (opex) from the current regulatory period averaged 11.9 percent below the AER benchmark. Much of the efficiency saving was driven by one-off synergy benefits from the merger of SP AusNet's transmission and distribution businesses. As such, savings of this magnitude are unlikely to occur in the future.

SP AusNet also achieved substantial savings for recurrent routine maintenance costs as the replacement capex program was rolled out, averaging 24.5 percent below the AER benchmark. These savings have been generated through changed work practices and investment in improved systems. Again, the easiest efficiency gains have been achieved and are unlikely to occur in the future at this rate.

In addition, a range of major repair programs have been identified as necessary during this six-year period, that are not of a recurring nature. These major operational expenditure programs cannot be benchmarked against the previous period, and have therefore been separately costed.

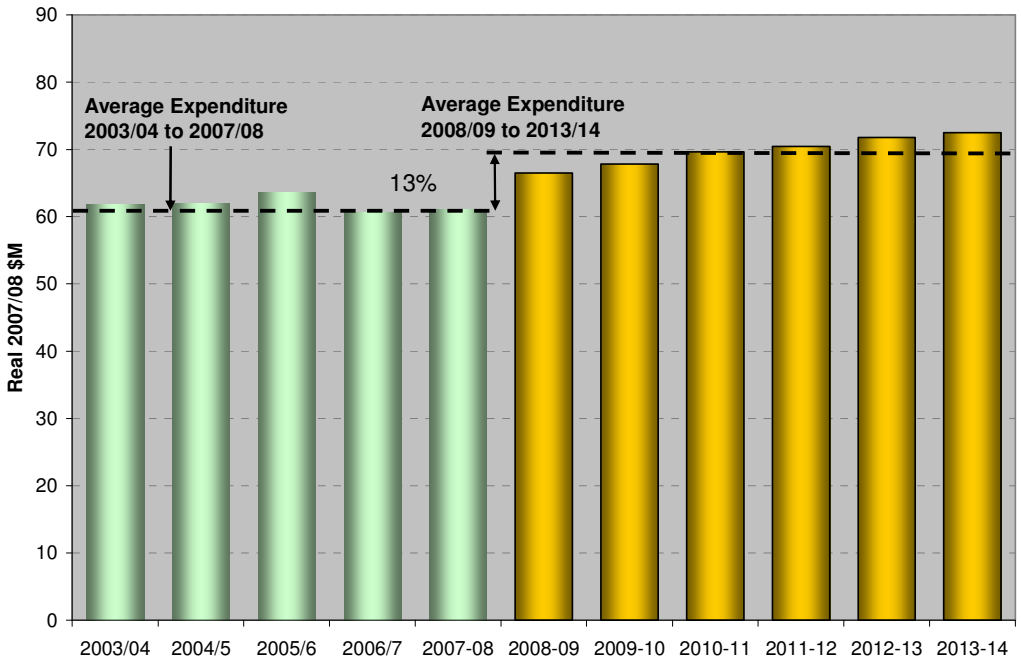
The asset works program between 2008 / 09 and 2013 / 14 will continue to focus on managing operational risk to within an acceptable band through:

- repair and prevention of tower corrosion through painting and component replacement;
- significant repair or refurbishment projects for switchgear, gas insulated switchgear refurbishment and repairs to power cables and instrumentation;
- reduction in occupational health and safety and environmental risk, through asbestos removal programs, switchyard resurfacing, removal of lead contamination and repair of transformer oil leaks; and
- infrastructure maintenance, advanced condition monitoring and miscellaneous works.

The present strong competition for skilled labour due to the resource and construction boom will continue to place upward pressures on the costs of efficiently procuring and deploying operating and maintenance resources. Despite these pressures, SP AusNet plans to deliver an efficient overall opex program in the forthcoming regulatory period at a total cost that represents a modest increase on the actual opex incurred in the current period.

Expenditure for the forthcoming regulatory period is only expected to increase by 13 percent in real terms. In addition, it is noteworthy that opex benchmarking analyses outlined in section 1.5 demonstrate SP AusNet's operational efficiency. This provides additional confidence that the proposed opex for the forthcoming regulatory period is efficient and consistent with delivering appropriate compliance and service outcomes. Figure 1.7 illustrates the opex profile over the current and future regulatory period. It should also be noted that the operating expenditure proposal reflects SP AusNet's careful consideration of the matters raised by the AER in its Draft Decision.

Figure 1.7 Total Controllable Operating Expenditure 2003/04 to 2013/14 (Real 2007/08 $m)



* Actual to 2006/07, forecast to 2013/14

* From 2003/04 to 2007/08 excludes easement tax, glide path for opex, debt and equity raising costs and rebates, from 2007/08 to 2013/14 excludes easement tax, glide path for opex, debt and equity raising costs and rebates, however, it includes SP AusNet's claim for self-insurance.

Source: SP AusNet

1.8 Easement Land Tax

In 2004, the Victorian Government extended land tax to electricity transmission easements owned by electricity transmission companies in Victoria. This revised Revenue Proposal includes a forecast for the land tax for each year of the regulatory period. SP AusNet's interpretation of the NER is that any positive or negative variation between the actual tax paid and the forecast adopted by the AER will be recovered or reimbursed, as appropriate, in accordance with SP AusNet's savings and transitional provisions in clause 11.6.21 of the NER. Therefore, SP AusNet will only recover the actual tax paid over the period.

This is consistent with the undertakings given by the Victorian Government at the time the tax was introduced, and the process was established by the Australian Competition and Consumer Commission (ACCC) in treating this issue during the previous regulatory period.

1.9 Return on Capital

The importance of the rate of return for a capital-intensive business with long-lived assets underpins the application of a conservative approach where there is uncertainty surrounding the estimation of the rate of return. In the longer term, consumers' interests are protected by ensuring adequacy and consistency in the rate of return available to investors in Australian energy infrastructure.

SP AusNet notes that there is a substantial body of regulatory precedent in relation to the rate of return applied to Australian infrastructure assets. This has been reflected in the methodology and parameters for this review, which are prescribed in Chapter 6 of the NER.

The Weighted Average Cost of Capital (WACC) is calculated according to those prescribed methodology and parameters. The nominal vanilla WACC used for the revised Revenue Proposal is 8.85 percent and is unchanged from SP AusNet's original Revenue Proposal submitted on 28 February 2007. The equivalent real vanilla WACC is 5.66 percent. These values will be updated to reflect prevailing capital market conditions at the time of the AER's Final Decision on SP AusNet's revenue cap.

1.10 Return of Capital (Depreciation)

Under Clause 6A.6.3 of the NER, depreciation schedules must use a profile that reflects the nature of the category of assets over the economic life of that category of assets.

SP AusNet has depreciated each asset category in the Regulated Asset Base (RAB) on a straight-line basis over the economic life proposed. As per Clause 6A.6.3, SP AusNet has followed standard practice by assigning a regulatory life to assets that equate to their expected economic or technical life. In general, the regulatory, economic and technical lives of an asset coincide.

In SP AusNet's original Revenue Proposal submitted on 28 February 2007, the company modified the regulatory lives in some asset categories from those used in the previous regulatory control period. The intention of this modification is to better reflect the true economic life of the secondary asset base by shortening the economic life from 25 years to 15 years, consistent with other Transmission Network Service Providers. This is driven by:

- the substantial replacement of analogue secondary equipment;
- the shorter life of "off the shelf" digital equipment; and
- the SCADA systems and Remote Terminal Units (RTU) in the secondary asset base having a technical life closer to 10 years.

SP AusNet also aligned the regulatory and statutory lives for information technology and business support costs to better reflect realistic expectations of asset lives.

The Draft Decision commented that it has assessed SP AusNet's depreciation schedules and considers that the methods and rates used are in accordance with clause 6A.6.3(b)(3), with the exception of the proposed economic life of vehicles. The AER considered that seven years reflects the expected economic life of these types of assets, and adjusted SP AusNet's depreciation schedules accordingly. Notwithstanding this, SP AusNet proposes to fully depreciate vehicles over three years, which is inconsistent with current industry practice.

1.11 Conclusion

This revised proposal outlines the revenue requirement for SP AusNet to operate its transmission business and provide its transmission services to customers. The revised Revenue Proposal has considered carefully and responded to the matters raised by the AER in its Draft Decision.

The revised revenue requirement ensures that SP AusNet can continue to provide high levels of asset performance and reliability, whilst optimising the mix and timing of expenditure to ensure that total life cycle costs are minimised. Victoria's average transmission prices will remain stable and the most competitive in Australia.

The annual revenue requirement has been constructed using the post-tax nominal building block approach in accordance with Chapter 6 of the NER and the relevant AER Guidelines and Models.

The forecast for each of these components is presented in the Table 1.11, together with the CPI - X smoothed revenue requirement.

Table 1.11: Revenue Requirement, 2008/09 to 2013/14 (nominal $m)

	Financial years ending 31 March					
	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Return on capital	194	203	211	220	228	238
Depreciation	*109*	*119*	*128*	*136*	*144*	*141*
Indexation	*-66*	*-69*	*-72*	*-75*	*-78*	*-81*
Net Economic Depreciation	43	50	56	61	66	59
Opex	78	81	86	89	93	97
Glidepath	9	7	6	4	2	0
Net tax allowance	13	14	15	15	15	14
Total Revenue (Net of ELT)	**337**	**355**	**373**	**388**	**405**	**409**
Easement Land Tax (ELT)	78	89	89	102	102	116
Total Revenue (Inclusive of ELT)	**415**	**444**	**462**	**490**	**506**	**525**
Smoothed revenue requirement	**414**	**437**	**460**	**485**	**512**	**540**

Source: SP AusNet forecasts

SP AusNet's revised Revenue Proposal addresses the issues raised by the AER's Draft Decision and provide further explanatory and supporting information to demonstrate why SP AusNet's position in the Revised Revenue Proposal should be adopted in the AER's Final Decision, in particular:

- Information supporting revisions to capital expenditure requirements;
- Information supporting revisions to operating expenditure, including;
- Maintenance cost for the North West contract;
- Land tax (non easement);
- Management fee expenses;
- Self insurance costs;
- Equity raising costs;
- Rebates (Availability Incentive Scheme) and
- Easement Land tax escalation.

2 Introduction and Background

2.1 Purpose, Structure and Coverage of this Document

This document sets out the revised Revenue Proposal for the Victorian electricity transmission network assets owned and operated by SPI PowerNet Pty Ltd (trading as SP AusNet), which provide prescribed transmission services. Submission of this document follows the earlier publication of SP AusNet's original Revenue Proposal[4] and the AER's subsequent Draft Decision[5]. This revised Revenue Proposal reflects SP AusNet's long-term business plan and also responds to the matters raised in the AER's Draft Decision.

This revised Revenue Proposal covers the regulatory control period commencing on 1 April 2008 and ending on 31 March 2014. A six-year period will smooth the future workload of both SP AusNet and the Australian Energy Regulator.

For the avoidance of doubt, the prospective costs and revenues associated with any non-contestable network augmentations undertaken over the regulatory control period commencing on 1 April 2008, fall outside of the revenue cap which is the subject of this revised Revenue Proposal.

This revised Revenue Proposal is submitted in accordance with, and complies with the requirements of Chapter 6A – Economic Regulation of Transmission Services – of the National Electricity Rules (NER) and relevant Guidelines issued by the Australian Energy Regulator (AER).

All numbers presented in this proposal are calculated on a GST exclusive basis.

Importantly, this revised Revenue Proposal builds on SP AusNet's original Revenue Proposal by retaining information where that information remains relevant. The document structure adopted in SP AusNet's original Revenue Proposal is also retained for this revised Revenue Proposal. In addition, matters raised by the AER in the Draft Decision are also addressed in this document, with appropriate explanations as to how SP AusNet has revised its original Revenue Proposal in relation to those matters.

The structure of this document is as follows:

- The remainder of this chapter provides: an overview of the transmission system in Victoria; a brief description of the role of SP AusNet in the Victorian transmission sector; and an outline of the organisational arrangements adopted by SP AusNet to maximise its business efficiency. This background information is intended to enable a clear understanding of the context in which this revised Revenue Proposal is made.
- Chapter 3 explains SP AusNet's asset management practices, that the capital expenditure has been efficient and prudent and demonstrates its overall cost and service performance against international benchmarks.
- Chapter 4 describes the service outputs to be delivered and the compliance obligations that must be addressed in the forthcoming regulatory control period.
- Chapters 5 and 6 describe SP AusNet's capex and opex proposals in light of recent expenditure levels, future network requirements and with particular regard to the AER's Draft Decision.

[4] SP AusNet, Electricity Transmission Revenue Proposal, 2008/09 – 2013/14, 28 February 2007.
[5] Australian Energy Regulator, SP AusNet Transmission Determination, Draft Decision, 31August 2007.

- *SP AusNet's revised Revenue Proposal addresses the issues raised by the AER's Draft Decision and provide further explanatory and supporting information to demonstrate why SP AusNet's position in the Revised Revenue Proposal should be adopted in the AER's Final Decision, in particular;*
  - Information supporting revisions to capital expenditure requirements;
  - Information supporting revisions to operating expenditure, including;
  - Maintenance cost for the North West contract;
  - Land tax (non easement);
  - Management fee expenses;
  - Self insurance costs;
  - Equity raising costs;
  - Rebates (Availability Incentive Scheme); and
  - Easement Land tax escalation.

- Chapter 7 calculates the regulated asset base for the forthcoming regulatory control period in accordance with the NER and taking account of the AER's Draft Decision, updated for the latest available information on 2006/07 and 2007/08 expenditure.
- Chapter 8 describes the depreciation allowance.
- Chapter 9 explains SP AusNet's capital financing costs and taxation and provides information supporting a revision of the forecast of CPI
- Chapter 10 applies an efficiency gain sharing mechanism in respect of opex efficiencies achieved during the current regulatory control period.
- Chapter 11 presents SP AusNet's revised total revenue requirement for the forthcoming regulatory control period and the resulting transmission price path. It reflects SP AusNet's revised view of the proposed price path in light of the AER's Draft Decision.
- Appendices A to Q are provided to support and substantiate SP AusNet's revised Revenue Proposal. It should be noted that Appendices A to G were provided as part of the original Revenue Proposal and have been retained in this document unchanged. In addition, SP AusNet has included at Appendix H, its response to the AER's Clause 6A.11.1 Information Request, which was submitted to the AER on 30 April 2007. The inclusion of Appendix H therefore ensures that the revised Revenue Proposal complies fully with the requirements of the NER. New Appendices I to Q have also been included as each responds in detail to specific matters raised in the Draft Decision. Appropriate cross-references to these new appendices are included in the main body of this revised Revenue Proposal.

2.2 Overview of the Victorian Transmission System

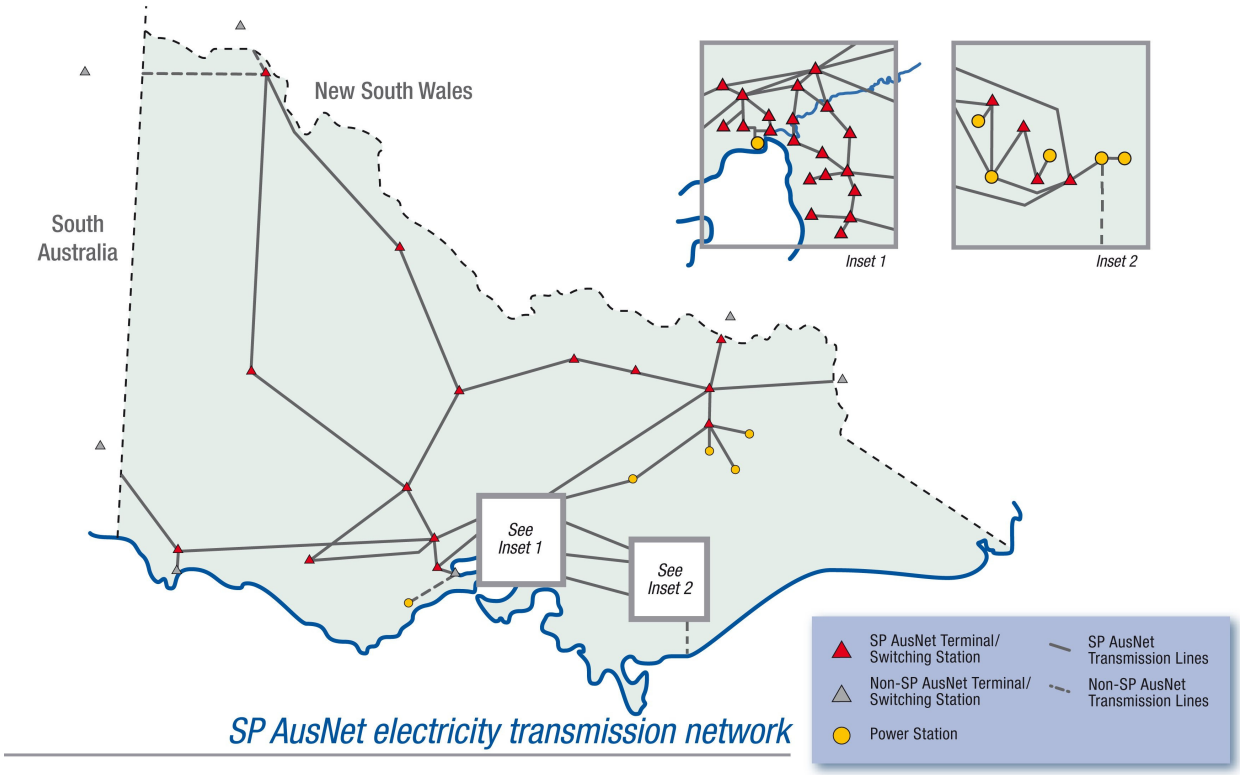
SP AusNet's electricity transmission network interconnects generators, distributors, high voltage customers and the transmission systems of the neighbouring States of New South Wales, South Australia and Tasmania. This network serves all of Victoria, covering an area of approximately 227,600 square kilometres and a population of over 5 million people[6].

In Victoria, the major transfer of power is between the coal and gas-fired generators in Gippsland, hydro-electric generators in the Victorian Alpine Region and the significant load centres of Melbourne, Geelong and the Portland aluminium smelter.

As illustrated in Figure 2.2.1, a 500 kV network backbone, running from the Latrobe Valley through to Melbourne and across the south-western part of the state to Heywood, serves the major load centres. This network is reinforced by:

- A 220 kV ring around Melbourne supplying 220 kV / 66 kV / 22 kV terminal stations;
- Inner and outer rings of 220 kV / 66 kV / 22 kV terminal stations in country Victoria supplying the regional centres; and
- Interconnections with New South Wales, South Australia and Tasmania

Figure 2.2.1 SP AusNet's transmission network – Victoria



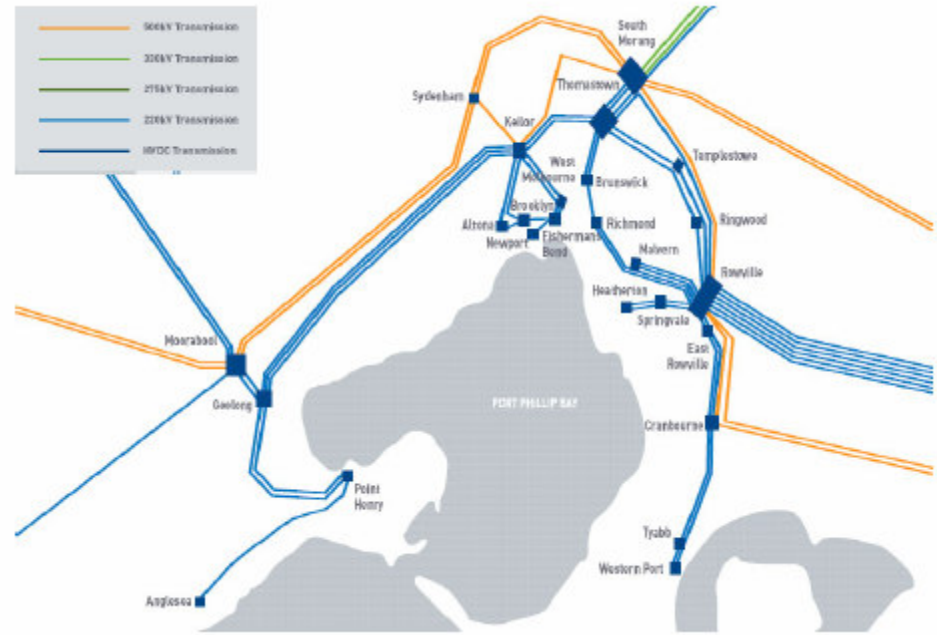
Source: SP AusNet

Metropolitan Melbourne is served by 500 kV and 220 kV networks which receive power from major generators in the Latrobe Valley, the Victorian hydro-electric power stations, the gas-fired Newport power station and the interstate links.

[6] Australian Bureau of Statistics, June 2006

The Melbourne metropolitan area transmission network is illustrated in Figure 2.2.2.

Figure 2.2.2 SP AusNet transmission network – metropolitan Melbourne



Source: SP AusNet

The Latrobe Valley to Melbourne transmission link comprises four 500 kV lines and six 220 kV lines. The 500 kV network supplies power from Loy Yang and Hazelwood power stations to Keilor, South Morang, Rowville and Cranbourne Terminal Stations. The 220 kV network transfers power from the Hazelwood and Yallourn generation units into the eastern metropolitan area at Rowville Terminal Station.

The 500 kV / 220 kV transformation added at Rowville Terminal Station in 1999 and Cranbourne Terminal Station in 2006 have provided the additional network capacity needed to service the continuing demand of the south-eastern metropolitan growth corridor.

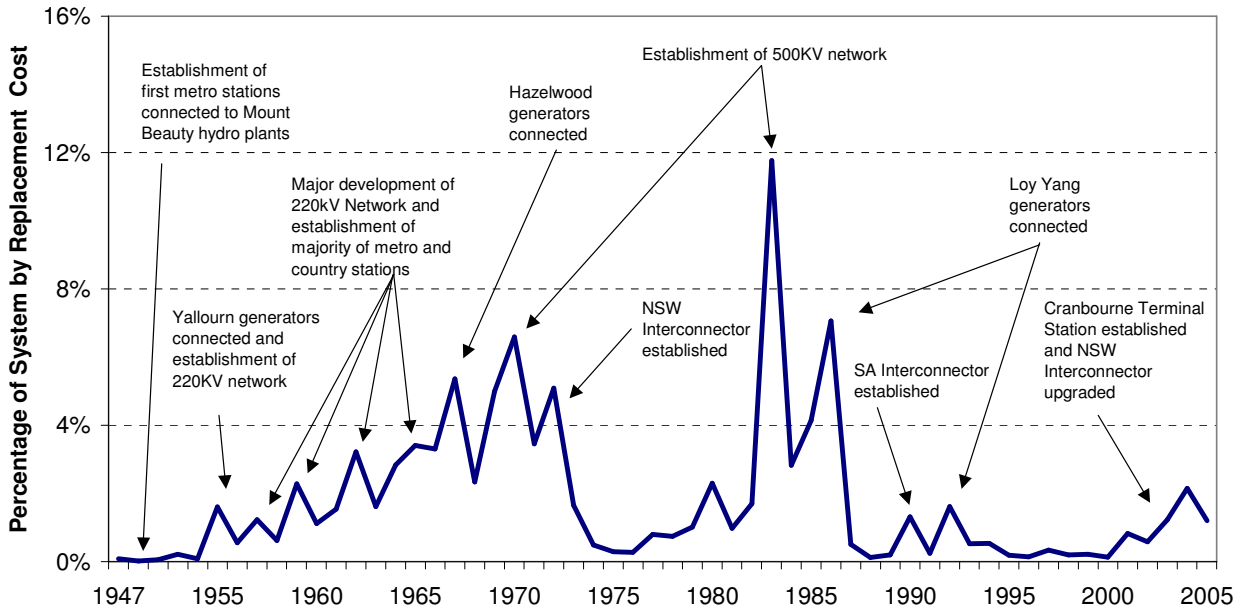
Supply from New South Wales and the Snowy Mountains generators is via two 330 kV lines from Dederang Terminal Station in Victoria's north-east to the South Morang Terminal Station on Melbourne's northern perimeter. A 220 kV system connects the Southern Hydro generators at Kiewa, Eildon and Dartmouth to Thomastown Terminal Station.

Springvale, Heatherton, East Rowville, Tyabb and Malvern Terminal Stations derive their supply from radial single tower, double-circuit 220 kV transmission lines to minimise the amount of land required for energy transmission in the metropolitan area.

Transmission links between Newport Power Station and Fishermen's Bend Terminal Stations and between Brunswick and Richmond Terminal Stations have increased the number of supply routes for the inner suburbs and the Central Business District.

The historic development of the SP AusNet transmission network is shown in Figure 2.2.3. The major development milestones are also highlighted. Figure 2.2.3 shows the relatively large amount of network development and investment that took place in the 1960s through to the early 1970s. Many of these assets installed over this period are approaching the end of their technical lives, and this will lead to an increasing need for the asset replacement expenditure over the next decade and beyond.

Figure 2.2.3 Historical Development of Victorian Transmission System



Source: SP AusNet

In response to the AER's request for further information under Clause 6A.11.1, SP AusNet submitted a detailed system map. A copy of that document is available at the AER's web page, under the heading "Supplementary Information" at:
http://www.aer.gov.au/content/index.phtml/itemId/710249/fromItemId/710179

2.3 Transmission Arrangements in Victoria

Under the disaggregation and privatisation of the Victorian Electricity Industry during the 1990s, responsibility for transmission was split between:

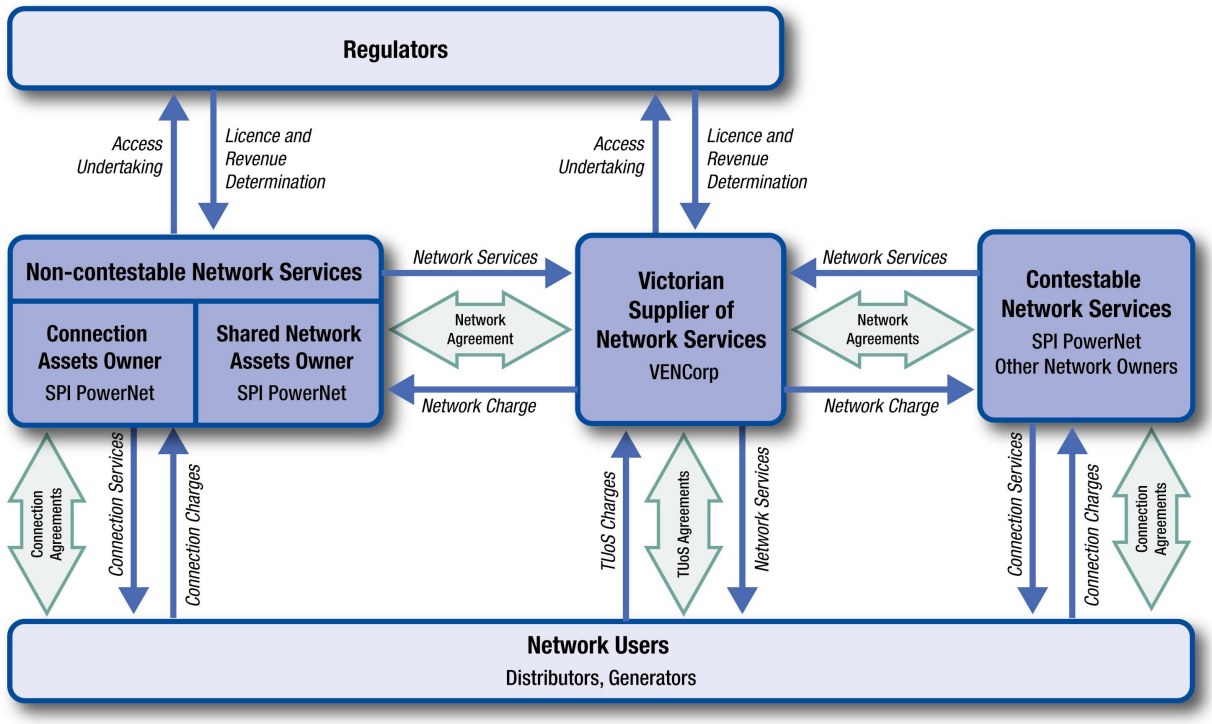
- VENCorp (then VPX), which is the body solely responsible for planning the shared network[7] and procuring network support and shared network augmentations;
- the asset owner, SP AusNet (then PowerNet Victoria); and
- the transmission customers (distribution companies, generation companies and directly-connected industrial customers) which are responsible for planning and directing the augmentation of their respective transmission connection facilities.

These arrangements differ from other states in Australia, where planning and responsibility for augmentation is not separated from the incumbent transmission company (although independent planning oversight occurs in South Australia). These arrangements have implications for the definition of SP AusNet's prescribed services, which are subject to the revenue cap proposed in this document.

[7] The shared transmission network is the main extra high voltage network that provides or potentially provides supply to more than a single point. This network includes all lines rated above 66 kV and main system tie transformers that operate between two voltage levels above 66 kV.

The relationships between these parties and the Regulators are shown in Figure 2.3.1.

Figure 2.3.1: Regulatory and commercial relationships



Source: SP AusNet

VENCorp is a government-owned organisation responsible for:

- procuring bulk shared network services from SP AusNet and other providers;
- providing transmission use of system services to transmission customers (including administering transmission pricing); and
- planning and requisition of augmentation to the shared transmission network.

The responsibilities of the parties within the Victorian structure for electricity supply are set out in Victorian legislation, the licences, guidelines and codes administered by the Essential Services Commission and Victorian derogations in Chapter 9 of the NER. Together these describe the Victorian model for procurement and provision of transmission services in Victoria.

A feature of the regime is the ability for significant augmentations to be sourced on a competitive basis by the parties responsible for planning and directing the augmentation of the transmission network. In these circumstances, SP AusNet competes with other providers for the right to construct, own and operate the augmentation. Any transmission service provided by SP AusNet on a contestable basis is a “non-regulated transmission service” and, pursuant to clause 6A.1.1 of the NER, these services are not subject to regulation under Chapter 6A of the NER.

Many transmission network augmentations are not suited to being procured on a contestable basis because of their high level of integration with the existing network. In such cases, the planner and director of augmentation (namely, VENCorp or a distributor) requests SP AusNet to provide the augmentation on a non-contestable basis.

The scope, specification and timing of these services is not the responsibility of SP AusNet and these are established by SP AusNet in accordance with the Victorian arrangements and are not prescribed services in respect of SP AusNet under Chapter 6A of the NER. Therefore, costs and revenues associated with any non-contestable augmentations that are undertaken within a regulatory control period sit outside the revenue cap for that regulatory period.

However, in other respects these services satisfy the definition of prescribed services, and NER clause 11.6.21 has been included during the recent development of new Rules for the regulation of transmission revenues. It provides for these non-contestable projects, developed within a regulatory period, to be added to the Regulatory Asset Base (RAB) at the commencement of the subsequent regulatory period, so that from that time they then form part of SP AusNet's revenue capped prescribed services. Chapter 7 outlines the non-contestable prescribed services that are to be added to the RAB for the forthcoming regulatory control period.

2.4 Organisational Arrangements

2.4.1 Management Company

'SPI Management Services', a wholly owned subsidiary of Singapore Power International Pte Ltd has entered into a Management Services Agreement with SP AusNet Networks (Transmission) Ltd and SP AusNet Networks (Distribution) Ltd. This agreement is to last for ten years but includes rights of termination to all parties under certain circumstances.

The Management Company provides the following services to SP AusNet[8]:

- Employee management;
- Business management;
- Evaluation of business opportunities;
- Management of regulatory compliance and relations with regulators;
- Financial and accounting management;
- Asset Management Strategy;
- Management of information technology;
- Management and coordination of maintenance & engineering services;
- Public and investor relations;
- Legal and company secretarial services; and
- General administration and company reporting.

This structure is designed to allow flexibility and the strategic ability to undertake new projects as and when they arise in the future. However, all the costs incurred in this management services agreement are costs that would be incurred by any transmission service provider.

The management company is reimbursed for the costs of providing these services through the service fee and receives further revenues under incentive arrangements. It is only elements of the service fee that are passed through into the regulated costs. None of the incentive arrangements result in a cost to the transmission business.

[8] As per SP AusNet Prospectus and Product Disclosure Statement

SP AusNet has allocated only the costs related to the provision of services to the transmission business into the regulatory accounts and not the price of the contract itself. This is to ensure that only appropriate costs are included within the base from which the forecast for the next regulatory period is developed.

2.4.2 Related Party Contracts

Interested parties should be aware that SP AusNet submitted supplementary information on related party contracts to the AER on 30 April 2007. The information supplements that contained in SP AusNet's original Revenue Proposal, and was submitted in response to a request issued by the AER pursuant to clause 6A.11.1 of the NER. For ease of reference, this supplementary information is set out in Appendix H. Supplementary information on related party contracts is provided in section 1.6 of Appendix H.

SP AusNet's only contract with a related party is the Management Services Agreement, as outlined above. As noted, SP AusNet reports costs on the basis of actual costs allocated to and associated with the provision of prescribed transmission services. These costs are clearly disclosed in the information provided as part of this revised Revenue Proposal for the forthcoming regulatory control period. The efficiency incentives that form part of the AER's economic regulatory framework allow the AER and stakeholders to be confident that SP AusNet's revealed costs are efficient.

Outsourcing arrangements are undertaken only where careful analysis demonstrates that such arrangements can be expected to result in a lower cost of service delivery than could be achieved from the provision of these services in house, or where the requirement for program services exceed internal capacity.

The extent of the cost reductions achieved by SP AusNet and revealed in the regulatory accounts demonstrates that the efficiency incentives are working to ensure the delivery of services to customers in accordance with their needs and preferences, at the lowest sustainable cost.

2.4.3 Allocation of Costs between Networks

Interested parties should be aware that SP AusNet submitted supplementary information on cost allocation to the AER on 30 April 2007. The information supplements that contained in SP AusNet's original Revenue Proposal, and was submitted in response to a request issued by the AER pursuant to clause 6A.11.1 of the NER. For ease of reference, this supplementary information is set out in Appendix H. Supplementary information on cost allocation is provided in section 1.12 of Appendix H.

The regulatory accounts relating to the electricity transmission business include only the share of SP AusNet's total costs that relate to the transmission business. Where possible this is done on a direct causal basis. Where shared costs cannot be directly attributed to the transmission network then an appropriate driver is used, given the nature of the cost, to allocate the shared cost between SP AusNet's networks (for example, relative RAB value, relative employee numbers).

2.4.4 Allocation of Costs between Regulated / Unregulated Segments

The regulatory accounts relating to the electricity transmission business only include regulated costs. All unregulated costs are allocated to unregulated activities at the time of deriving the regulatory accounts for the electricity transmission business.

As noted above, information supplementing SP AusNet's original Revenue Proposal in relation to this matter has been provided in section 1.12 of Appendix H.

3 Efficient Asset Management and Performance

3.1 Introduction

This chapter demonstrates that SP AusNet's advanced asset management processes enables the company to perform effectively in terms of capital expenditure allocation, delivery and benchmarking. As noted in further detail in this chapter:

- SP AusNet's sound asset management processes have enabled the company to deliver its planned capital program over the 2002 / 03 – 2007 / 08 period, ensuring that the network continues to meet the high standard of performance expected by customers. This has been achieved within 9 percent of the allowance set at the last revenue cap review, despite a number of unanticipated major works identified through the ongoing review of key network needs. This demonstrates the prudence and efficiency of the company's actual capex over the 2002 / 03 – 2007 / 08 period; and
- The effectiveness, efficiency and robustness of the company's Asset Management Strategy and related processes have been recently confirmed through an independent review of risk management processes by Jervis Consulting.

The chapter is structured as follows:

- Section 3.2 provides an overview of SP AusNet's approach to asset management, including its Asset Management Strategy;
- Section 3.3 outlines SP AusNet's asset management documentation and process;
- Section 3.4 demonstrates that SP AusNet's asset management processes benchmark well compared to other transmission companies;
- Section 3.5 provides a high-level description of the capital projects completed during the current regulatory control period, in accordance with the Company's asset management strategy and plans. This information is intended to assist the AER in conducting its review to ensure that expenditure has been prudent. Section 3.5 also sets out SP AusNet's response to matters raised in the Draft Decision in relation to actual capex over the period from 2002/03 to 2007/08; and
- Section 3.6 concludes the chapter by presenting cost and service benchmarking information that confirms SP AusNet's strong operational performance and efficiency, thereby providing further evidence of the company's prudent and efficient asset management and operational practices.

Interested parties should be aware that SP AusNet submitted supplementary information in relation to historic expenditure to the AER on 30 April 2007. The information supplements that contained in SP AusNet's original Revenue Proposal, and was submitted in response to a request issued by the AER pursuant to clause 6A.11.1 of the NER. For ease of reference, this supplementary information is set out in Appendix H. Supplementary information relating to historic capital expenditure is provided in section 1.2 of Appendix H.

3.2 Overview of SP AusNet's Approach to Asset Management

3.2.1 Background

The overall reliability and security of the transmission network is critically dependent on the continuous and trouble-free operation of all the individual items of plant that, together, form the transmission network. The design of the transmission system generally allows an outage of a single item of plant without any impact on reliability (supply to customers). However, such an outage will impact on security (the ability of the system to withstand further events).

Unexpected plant failures at times of system stress, or during other plant outages, may lead to customer outages or prolonged periods of reduced security. An equipment failure can place substantial load at risk (reducing system security) or even result in loss of supply arising directly from the failure itself, or because of the need to shed load to return the system to a secure operating state. Explosive failures of plant are of particular concern because of obvious health and safety risks, and because it can also result in failure of adjacent plant, often rendering it unavailable for service on a prolonged basis, due to damages sustained in an explosion.

In view of these considerations, a key purpose of the asset management strategy is to identify necessary equipment replacement actions in advance of any such potential failure. This is achieved through a careful assessment of the potential risk of failure for each plant item, and repairing or replacing deteriorating equipment before a failure occurs.

Every asset on the system has a risk of failure related to condition. The risk associated with each plant item depends on the possibility that the individual asset may fail, and the impact on the network and network users in the event that the failure did occur. The possibility that an item of plant may fail depends on the age and condition of the equipment, while the impact of a failure will vary substantially depending on its location and the loading of the transmission network.

3.2.2 SP AusNet's Asset Management Strategy

SP AusNet's vision is to be the best network business. To achieve this vision, SP AusNet aims to provide transmission network services in the most reliable, efficient, safe and environmentally responsible manner as possible.

The company recognises that it must continually seek to improve its performance to achieve this vision. Accordingly, SP AusNet is clearly focused on continual performance improvement. The Asset Management Strategy provides the framework within which specific actions can be planned and executed to ensure that the company achieves its objective of reliable, efficient, safe and environmentally responsible service provision.

Specifically, the Asset Management Strategy aims to deliver the following key outcomes for the Victorian transmission network and its customers:

(1) maintaining a stable and sustainable network asset failure risk profile to ensure supply reliability in accordance with customers' needs and preferences;

(2) meeting operational service targets for network reliability and availability;

(3) complying with operational codes and regulations and with occupational health and safety, environmental and security legislation, codes and regulations; and

(4) optimising total capital, operating and maintenance costs over each asset's entire life cycle.

3.2.3 Efficient Risk Management Approach to Asset Management

SP AusNet has adopted a rigorous approach to identifying necessary asset replacement. This approach recognises that while asset age is a key indicator of the need for replacement, the key determinant is the condition of the asset. Asset condition will deteriorate with age, but may also depend of other factors, including for example the location of the assets, and specific operating requirements or duty cycles that differ from normal.

The development of the asset replacement program takes into account both the condition of the asset, and the implications of failure.

3.2.4 Consequence

The impact of failure of each particular asset within an asset class may differ considerably and it may impact very differently on customers. As an example, where there is redundancy in the network design, an outage may be tolerated without any customer outages, while in the case of dedicated plant items an outage would result in outages for customers that are supplied from the dedicated plant item.

Consequence of failure models are constructed for each individual asset based on its location within the overall network and the credible outcomes that would arise from a major failure in terms of reliability, availability, health, safety, environment and code compliance. Consequence models are calibrated to the outcomes of recent failures as recorded in System Incident Reports.

3.2.5 Asset Condition and Probability of Failure

Assigning an accurate probability of failure to each individual asset is achieved through the following process:

- Standard probability of failure (PoF) curves are defined, which relate the probability of failure to the length of time an asset has been in service. These curves are developed for each class of asset based on a variety of information and experience. A “base” curve is established which represents the characteristic for a “typical” asset within the category operating in a “typical” environment. At least, in principle, it could be expected that the service period on this curve that aligned to the point at which the probability of failure reaches an unacceptable level, would be the technical life that is assigned to this asset class.
- A family of curves are developed to cover circumstances where asset condition degrades at different rates to the typical case. Differences may arise where the operating environment differs from average for different operating requirements, as a result of a specific incident that impacted on the particular item of plant, or through type or design problems that emerge for the plant item.
- Curves are established which show the impact where the above factors have combined to result in more rapid degradation of asset condition (a more rapid increase in the probability of failure than would be typical for this asset) or a slower degradation of asset condition (reflected through a slower increase than average in the probability of asset failure). This results in failure probability curves for each asset fleet which may be viewed as a “short life” asset failure curve and a “long life” asset failure curve, with intermediate curves defined as required.

An assessment is made for each individual plant item based on maintenance records, system incident reports, equipment defect reports, the experience of SP AusNet’s engineers, information from manufacturers and advice from other transmission utilities.

This information is used to identify the appropriate probability of failure curve to be used as the basis for the condition assessment. It is then possible to assess each asset to determine whether or not it is approaching the point where the probability of failure becomes unacceptably high.

It is important to recognise that the point where the probability of failure becomes unacceptable may differ for individual assets within an asset fleet or class, depending on the potential impact of the failure. This information is taken into account when making the assessment of whether the probability of failure has reached the "critical" point for each particular asset.

The probability of failure curves are developed from experience and understanding of the performance and life of the relevant plant items. This is augmented by a calibration process where the "mean time between failure" which is predicted by the curve is calibrated with the outcomes from historical outage information for the asset fleet.

3.2.6 Optimising Total Life Cycle cost

One of SP AusNet's key objectives is to provide transmission network services in the most efficient manner (consistent with other objectives) by optimising total life cycle costs. SP AusNet's Asset Management Strategy ensures that its overall expenditure and work plans minimise life cycle costs using detailed cost-benefit analyses.

SP AusNet's cost-benefit analyses use discounted cash flow analysis techniques (in accordance with the reliability limb of the regulatory test), for all major projects where costs can reasonably be estimated (estimation declines in accuracy towards the end of the forecast regulatory period). These costs include capital costs, operational risks and operating and maintenance costs. The assessment includes a quantitative estimate of the value of reliability, taking the risk of plant failure and the consequences of unserved load (namely, the cost to consumers of involuntary supply interruption), and reduced network performance into account as part of each asset management decision.

In addition to developing least-cost options for addressing specific equipment issues, careful attention is paid to ensure that overall program costs are minimised when specific solutions are consolidated into overall opex and capex plans. These plans incorporate additional work scheduling efficiencies for the entire planning period by integrating projects, where possible.

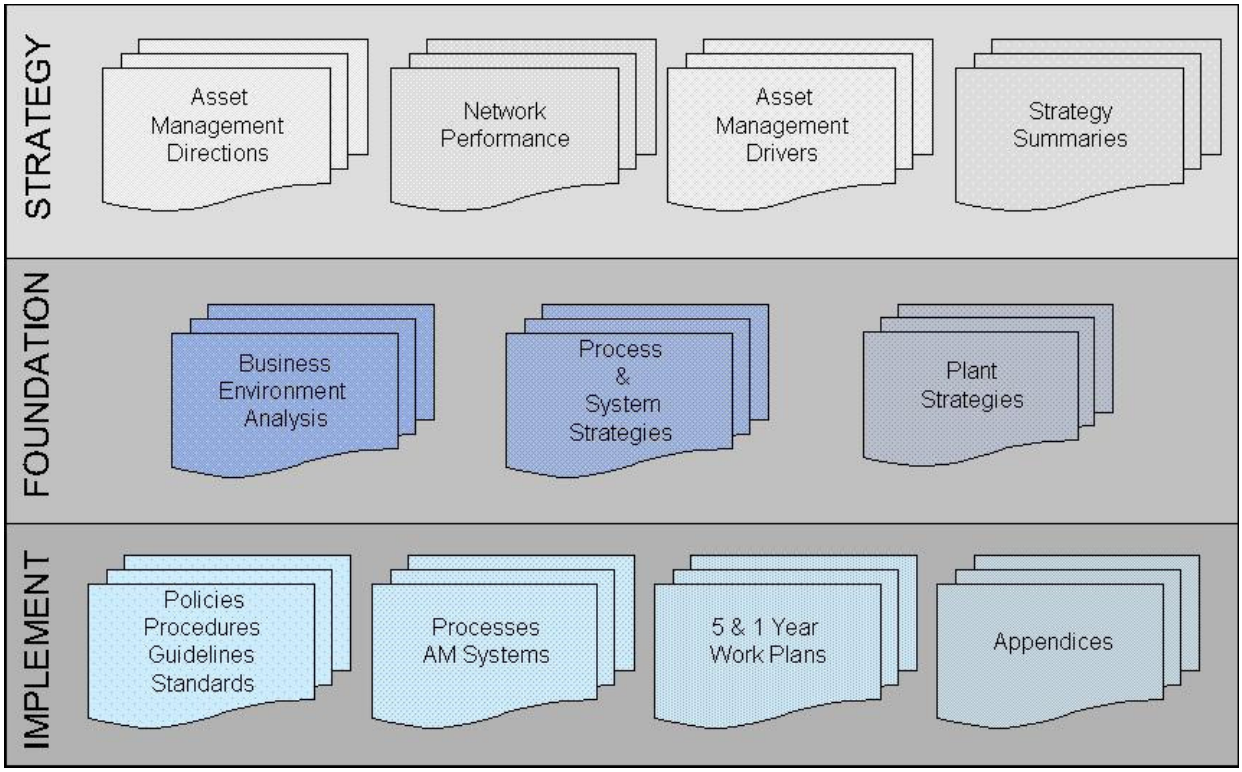
As well as co-ordinating the various SP AusNet-initiated replacement projects, the Asset Management Strategy also integrates replacement plans with the augmentation plans of VENCorp, the distributors and the generators. This approach:

- minimises project delivery costs by optimising engineering effort and resource utilisation; and
- enhances network performance by minimising the number of outages required to carry out the full work program.

3.3 Asset Management Documentation and Process

SP AusNet has developed a three-tiered documentation structure to guide and support its asset management processes. At the apex of this structure is the Asset Management Strategy, which is central to the asset management process. This document is supported by two levels of resource documents, one focused on the analytical foundation to the strategy and the other on implementation of the strategy. The hierarchy of this structure is illustrated in Figure 3.3.1.

Figure 3.3.1: Asset Management Strategy Documentation

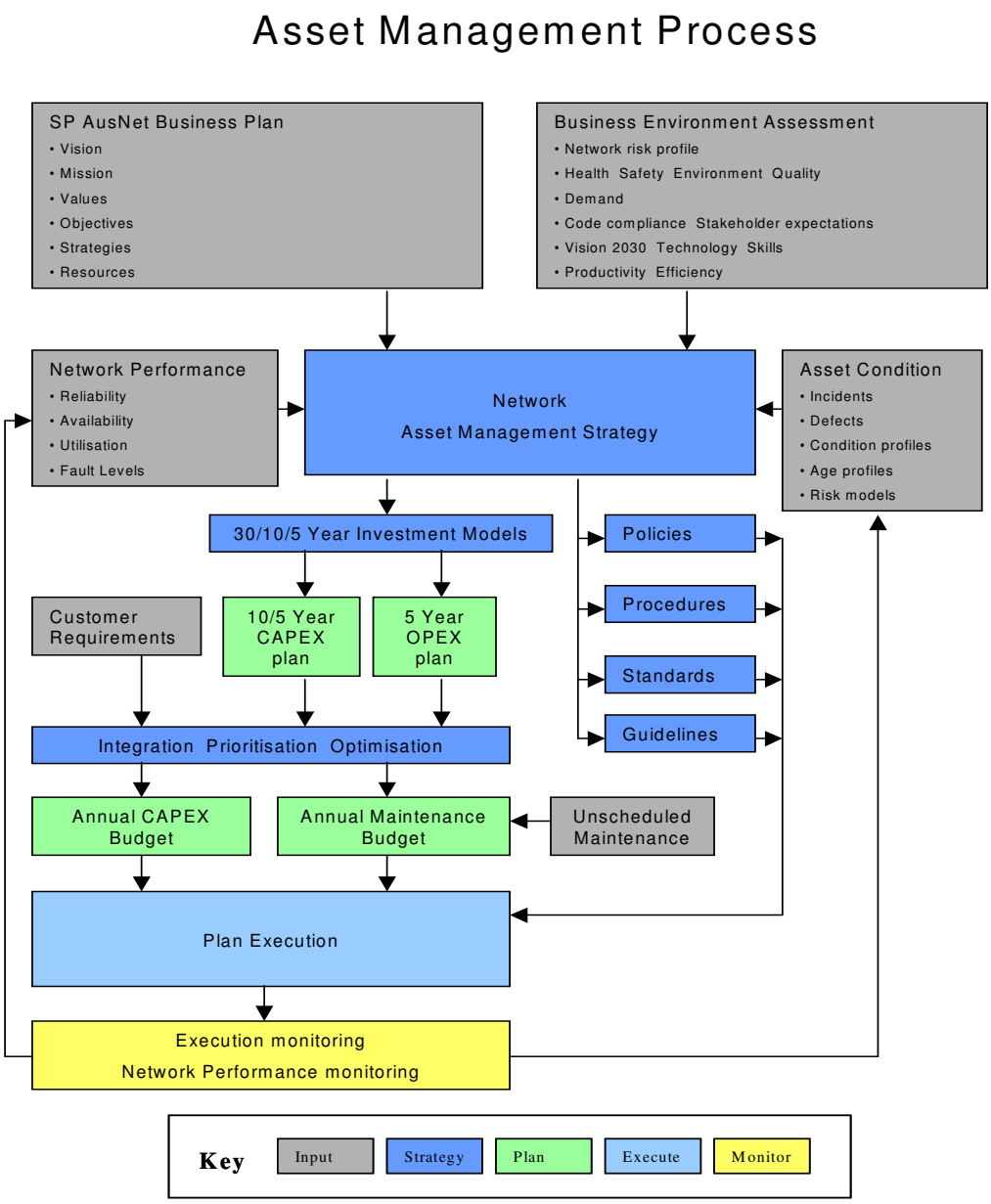


Source: SP AusNet

The asset management process ensures that the strategy and its supporting documentation is informed by inputs from the SP AusNet business plan, assessments of the external environment, asset condition, network performance and the future augmentation requirements of customers. The asset management process also ensures that the strategy feeds into the implementation plans and internal budgeting process.

The asset management process is an iterative one, and it involves updating the Asset Management Strategy and associated documents and actions required when conditions and information change. The asset management process showing the inter-relationships between inputs, strategy, planning and implementation is illustrated in Figure 3.3.2.

Figure 3.3.2 Asset Management Process



NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

3.4 Benchmarking of SP AusNet's Risk Management Processes

SP AusNet commissioned Jervis Consulting to prepare a report on SP AusNet's transmission risk management processes, and to benchmark those processes against the United Kingdom's gas and electricity utilities.

In completing the review, Jervis Consulting referred to the results of the UK Regulator's *2002 Office of Gas and Electricity Markets (Ofgem) Asset Risk Management Survey*. This survey included the 14 large UK electricity and gas network operators, and it was used by the UK regulator to assess the quality of "medium and long term asset risk management practices".

The Jervis Consulting Report's key conclusion was:

> SP AusNet is undertaking its asset risk management activities in a structured and sound manner and is at or better than most best practices identified in the UK Ofgem study.

More specifically, Jervis Consulting found that[9]:

- in terms of Business Strategy and Direction, SP AusNet's performance was generally equal to the average. Business strategy and direction includes clear aims and objectives, identification of key issues for risk management, clear structures and accountabilities, integration of information, analysis and operations, good risk assessment and decision making and good review processes;
- in relation to Asset and Network Strategy, SP AusNet outperforms the average in all categories. Asset and network strategy includes good policies and procurement practices, defining asset life and sustainability, recording asset information, innovation and new technology, security of supply and asset utilisation and compliance with legislation; and
- in Asset Life Cycle Management, SP AusNet again shows superior performance in all segments. Asset life cycle management includes procurement and project delivery practices, asset register contents, utilisation, use of contractors and suppliers, inspection and maintenance regimes, risk assessment and decision-making.

The report findings provide independent confirmation that SP AusNet has effective risk management processes in place at the core of its asset management strategy, which accords with good industry practice, and which facilitates the efficient delivery of a safe, reliable and secure network for customers while also ensuring compliance with all applicable statutory obligations[10].

[9] Jervis Consulting Report (Appendix A)
[10] These compliance obligations are described in Chapter 4.

3.5 Delivery of Prudent and Efficient Capital Expenditure

3.5.1 Introduction

The Asset Management Strategy has been employed over the current regulatory period to assist SP AusNet to determine, amongst other things, the level of asset replacement expenditure over that period. SP AusNet's Asset Management Strategy and related processes ensure that the company undertakes only those projects that are required to maintain network performance and reliability in accordance with customers' needs, at the lowest total life cycle cost. Accordingly, SP AusNet is confident that all capital expenditure undertaken during the current regulatory period is prudent and efficient.

It is important to remember that prudent asset management is a dynamic process with continual revision and updating of the underlying analysis as new information or problems come to light. Therefore, it is inevitable that there are differences between the forecast and delivered capital programs as asset management priorities change to ensure the most critical work is completed.

This is an important consideration because the AER's *Statement of Regulatory Principles* (SRP) provides for a test by the Regulator to determine if the actual the capital expenditure by SP AusNet during the current regulatory is "prudent" before that expenditure is permitted to be included in the Regulatory Asset Base[11].

Accordingly, the AER must make an assessment of the of SP AusNet's capital expenditure to determine if it was prudent before the opening asset base value (that will apply at the start of the forthcoming regulatory control period) can be set.

SP AusNet understands that the test to determine prudency involves a systematic examination of a TNSP's decisions in selecting and delivering investments. The purpose of the examination is to establish whether the TNSP made decisions at each stage of the investment process that were consistent with good industry practice. The examination consists of three sequential stages and is applicable to projects regardless of whether or not they have undergone the regulatory test. The three stages are:

(1) Assess whether there is a justifiable need for the investment. This stage examines whether the TNSP correctly assessed the need for investment against its statutory rules and obligations. The assessment focuses on the need for investment, without specifically focussing on what the correct investment to meet that need is. An affirmation of the need for an investment does not imply acceptance of the specific project that was developed.

(2) Assuming the need for an investment is recognised, assess whether the TNSP proposed the most efficient investment to meet that need. The assessment reviews whether the TSNP objectively and competently analysed the investment to a standard that is consistent with good industry practice.

(3) Assess whether the project that was found to be the most efficient was developed, and if not, whether the difference reflects decisions that are consistent with good industry practice. This assessment examines the factors that caused changes in the project design and/or delivery, and assesses how the TNSP responded to those factors relative to what could be expected of a prudent operator.

[11] These arrangements are preserved as a transitional rule in Clause 11.6.9 of Chapter 11 of the National Electricity Rules.

SP AusNet has examined the AER's recent Draft Decision on the Queensland transmission network revenue cap[12] to obtain a more detailed understanding of the AER's approach to conducting these reviews. Page 17 of the Draft Decision stated:

> "In consultation with the AER, PB's approach in conducting its detailed reviews involved selecting a sample of projects, which consisted of large and small commissioned projects from all of Powerlink's investment categories. These included projects that were commissioned either under or over the original budget. Several large augmentation projects were selected to assess whether Powerlink properly applied the regulatory test. Several small projects were also selected to assess the prudency of low value investments, since these projects comprise a significant proportion of Powerlink's commissioned projects. This approach also provided PB with the opportunity to review whether Powerlink was properly implementing its specified capex policies."

SP AusNet anticipates that the AER will adopt a similar approach in reviewing this revised Revenue Proposal.

3.5.2 Assessing SP AusNet's Historic Capital Expenditure Program

SP AusNet's original Revenue Proposal

SP AusNet's original Revenue Proposal noted that SP AusNet's management of its capex program across the six-year period from 1 April 2002 to 31 March 2008 is relevant to the current review. This period includes the forecast for the last nine months before the commencement of the current regulatory period, which is necessary for calculating the opening RAB (on 1 January 2003) for the current period.

The completed program has not been identical to that approved in the 2002 Decision as priorities, problems and solutions have changed. Nonetheless, the majority of the program forecast in 2002 has been rolled out. The comparison between forecast and actual capex over the period, as presented in SP AusNet's original Revenue Proposal is shown in Table 3.5.1.

Table 3.5.1: Capital Expenditure 2002/03 to 2007/08 (Nominal $m) as submitted in SP AusNet's original Revenue Proposal

Year	2002/03	2003^	2003/04	2004/05	2005/06	2006/07*	2007/08*	Total
Decision (CPI Adjusted)	73.1	17.7	73.4	69.0	58.7	82.0	85.2	441.5
Actual Capex	38.2	30.4	52.4	71.2	102.1	108.9	116.3	489.1
Actual Disposals	-0.8	-0.7	-1.0	-2.2	-1.6	-0.8	-0.8	-7.1
Actual Net Capex	37.4	29.7	51.4	69.0	100.5	108.1	115.6	481.9
Difference	**-35.7**	**11.9**	**-22.0**	**0.0**	**41.7**	**26.1**	**30.3**	**40.5**

^ Stub period from 1 January to 31 March 2003.

* Forecasts

Source: SP AusNet Roll-forward Model

It should be noted that SP AusNet lodged its original Revenue Proposal using actual capex for 2002/03 to 2005/06. For 2006/07 the original Revenue Proposal contained 9 months of actual

[12] AER Draft Decision, Powerlink Queensland Transmission Network Revenue Cap 2007-08 to 2011-12, 8 December 2006

data and 3 months of forecasts. Forecasts were used for 2007/08 capex and the WIP outstanding at the end of 2007/08.

During the review process following SP AusNet's submission of its original Revenue Proposal, several minor variations to non-system capex were made to improve the accuracy of the allocation into the non-system asset classes. There was no net change to the total non system capex from this reallocation. These adjustments are shown in Table 3.5.2 below.

Table 3.5.2: Non-system Capital Expenditure Adjustments 2002/03 to 2007/08 (Nominal $m)

Year	2003^	2003/04	2004/05	2005/06	2006/07*	2007/08*	Total
Original Proposal							
Inventory	0.03	1.58	0.40	1.65	0.38	0.00	4.04
IT	3.96	6.18	5.13	9.25	5.69	7.67	37.87
Premises	0.67	0.51	0.71	6.22	2.79	0.00	10.90
Office Equipment	0.15	0.07	0.15	0.05	0.00	0.00	0.42
Tools and Equipment	0.43	1.59	1.03	0.39	0.95	0.52	4.89
Vehicles and Mobile Plant	0.32	1.39	0.95	1.48	1.08	0.07	5.29
Other	0.00	0.45	1.57	2.22	0.00	0.00	4.23
Total	**5.57**	**11.77**	**9.93**	**21.25**	**10.88**	**8.26**	**67.65**
Adjustments during review							
Inventory							
IT			0.83			-2.52	-1.69
Premises							
Office Equipment							
Tools and Equipment						1.34	1.34
Vehicles and Mobile Plant						1.18	1.18
Other			-0.83				-0.83
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Modified Original Proposal							
Inventory	0.03	1.58	0.40	1.65	0.38	0.00	4.04
IT	3.96	6.18	5.96	9.29	5.69	5.15	36.23
Premises	0.67	0.51	0.71	6.22	2.79	0.00	10.90
Office Equipment	0.15	0.07	0.15	0.05	0.00	0.00	0.42
Tools and Equipment	0.43	1.59	1.03	0.39	0.95	1.86	6.23
Vehicles and Mobile Plant	0.32	1.39	0.95	1.48	1.08	1.25	6.46
Other	0.00	0.45	0.74	2.17	0.00	0.00	3.37
Total	**5.57**	**11.77**	**9.93**	**21.25**	**10.88**	**8.26**	**67.65**

^ Stub period from 1 January to 31 March 2003.

* Forecasts

Source: SP AusNet

The Draft Decision and SP AusNet's response

The AER's Draft Decision accepted SP AusNet's original Revenue Proposal and the modified non-system adjustments (detailed above) with two minor variations in the final year. The adjustments are:

- the (possibly unintentional) rejection of the reallocation of IT non system costs into vehicles and tools and equipment categories resulting in a cut to forecast non-system capex in 2007/08; and

- $0.4 M of contingency removed from the 2007/08 forecast for the Redcliffs Terminal Station rebuild project.

In effect, SP AusNet's revised Revenue Proposal implements the Draft Decision with updated capex forecasts. As stated above, SP AusNet lodged its original Revenue Proposal using capex forecasts for 2006/07 which contained 9 months of actual data and 3 months of forecasts. SP AusNet's revised Revenue Proposal includes a full year audited costs for the 2006/07 capex. SP AusNet's total capex forecast was within 2% of the actual outcome.

SP AusNet has also updated forecasts for 2007/08 and the WIP at the end of 2007/08 where better data has become available.

Importantly, these updates render the adjustments in the Draft Decision (described above) obsolete. In particular:

- a new 2007/08 capex forecast for IT has been provided; and
- the updated forecasts for Redcliffs Terminal Station rebuild project no longer include a contingency for the project as final costs are more certain.

Having regard to all of the foregoing information, the capital expenditure for 2002/03 to 2007/08 is shown in Table 3.5.3 below.

Table 3.5.3: Revised Capital Expenditure 2002/03 to 2007/08 (Nominal $m)

Year	2002/03	2003^	2003/04	2004/05	2005/06	2006/07	2007/08*	Total
Decision (CPI Adjusted)	73.1	17.6	73.4	69.0	58.5	81.5	85.2	440.7
Actual Capex	38.2	30.3	52.6	71.2	101.9	107.2	109.0	480.1
Actual Disposals	-0.8	-0.7	-1.0	-2.2	-1.6	-0.2	-0.4	-6.1
Actual Net Capex	37.4	29.6	51.7	69.1	100.3	107.0	108.6	474.0
Revised Difference	-35.7	11.9	-21.7	0.1	41.8	25.5	23.4	33.3
Original Difference	**-35.7**	**11.9**	**-22.0**	**0.0**	**41.7**	**26.1**	**30.3**	**40.5**

^ Stub period from 1 January to 31 March 2003.

* Forecasts

Source: SP AusNet Roll-forward Model

The capital expenditure for 2002/03 to 2007/08 shown above has been incorporated into SP AusNet's regulatory asset base for this revised Revenue Proposal as set out in section 7.7.

Matters relating to SP AusNet's Historic Capital Expenditure Program

SP AusNet's original Revenue Proposal noted that while the quantum of capital expenditure forecast has been spent in total, the profile has differed from what was forecast to achieve a managed increase in the capex program. This was done to:

While the quantum of capital expenditure forecast has been spent in total, the profile has differed from what was forecast to achieve a managed increase in the capex program. This was done to:

- allow the lessons learnt from managing some of the initial station rebuilds to be used in later projects. This was important, as rebuilds had not been performed on the system before 2000. In particular, new standards and processes had to be developed and tested on early projects before being rolled out across the program;

- allow a steady increase in resourcing to help maintain a competitive environment for service providers of design and construction services. This avoided large jumps in tendered work which can increase supplier pricing power;
- allow rescheduling to incorporate new higher priority work programs not forecast at the last reset, i.e. the tower safe access program addressing newly identified health and safety risks and resulting standards; and
- allow rescheduling to integrate the program with the modified augmentation plans of VENCorp and the Distributors, i.e. the Kerang Terminal Station refurbishment was delayed so it could be integrated with a Powercor transformer augmentation;

These initiatives reduced the overall cost of the program. Therefore, the net result of SP AusNet's management of its capex program has resulted in a lower inflation adjusted RAB. This lower RAB results in permanently lower prices for customers in the future.

Importantly, there has not been any net deferral of work between periods (which would simply mean price rises in future) once the inclusion of unforecast work is accounted for.

To assist the AER in conducting its prudency review, a list of the major capital projects undertaken during the current regulatory period, together with a summary of the actual/forecast cost for each project is provided in Table 3.5.2. The list also indicates whether or not the project was foreseen (and budgeted for) at the time of the last revenue cap review in 2002.

Table 3.5.2: Largest Projects or Programs by Capitalisation (>$10M)

Station Switchyard	Business Case	Forecast in 2002	Status	Actual/Forecast Costs*
Malvern Terminal Station Redevelopment	$36.5M	Yes	Ongoing	$38.6M
Optical Fibre Ground Wire Installation Program	$33.0M	Yes	Complete	$29.9M
Brunswick Terminal Station Refurbishment	$21.5M	Yes	Complete	$22.1M
Water and Oil Management Program	$17.7M	Yes	Ongoing	$17.6M
Terang Station Refurbishment	$16.2M	Yes	Complete	$17.6M
Tower Safe Access Program	$18.0M	No	Ongoing	$16.8M
Station Security Upgrade	$17.1M	No	Ongoing	$15.4M
Redcliffs Terminal Station Refurbishment	$11.1M	Yes	Complete	$15.0M
Ballarat Terminal Station Refurbishment	$15.5M	Yes	Complete	$14.6M
Bendigo Terminal Station Refurbishment	$14.8M	Yes	Complete	$14.5M
Mount Beauty Terminal Station Redevelopment	$12.3M	Yes	Complete	$12.1M
Eildon Power Station Switchyard Rebuild	$11.1M	Yes	Complete	$10.7M
Shepparton Terminal Station Refurbishment	$10.7M	Yes	Complete	$10.5M
Horsham Terminal Station Redevelopment	$9.9M	Yes	Complete	$10.3M
Instrument Transformer Replacement Program	$12.7M	No	Ongoing	$10.2M
Kerang Terminal Station Refurbishment	$9.9M	Yes	Complete	$10.1M

Note: actual/forecast cost includes project IDC.
Source: SP AusNet

The following sections provide a brief description of the planned and unanticipated capex programs undertaken during the current regulatory period.

As noted in section 3.1, information supplementing SP AusNet's original Revenue Proposal in relation to this matter has been provided in section 1.2 of Appendix H.

3.5.3 Planned Station Rebuild and Refurbishment Program

This program constituted the major part (45 percent) of SP AusNet's planned capex program for the current regulatory period. In its 2002 revenue cap proposal, SP AusNet proposed the replacement or major refurbishment of switchyards at twelve stations. The detailed program is listed in Table 3.5.3.

After completing detailed engineering analysis of each proposed station rebuild or refurbishment, SP AusNet has delivered the program approved by the ACCC for the 2002 / 03 to 2007 / 08 period. SP AusNet has achieved this positive outcome through:

- various cost control measures including increased use of long-term purchasing contracts with suppliers, partnering with various providers, and optimising the mix of insourcing and outsourcing of resources in response to quoted prices;
- improvements to asset management systems and processes; and
- close integration of the program with customer augmentation where possible to achieve cost synergies.

The deferral of the Dederang terminal station refurbishment was shown by detailed engineering studies to be the most economically efficient action to take in that particular case.

Table 3.5.3 Station Refurbishment Program proposed by SP AusNet in 2002

Station Switchyard	22 kV	66 kV	220 kV	Status
Eildon Power Station Switchyard			Y	Complete
Kerang Terminal Station		Y	Y	Complete
Brunswick Terminal Station	Y		Y	Complete
Ballarat Terminal Station		Y	Y	Complete
Shepparton Terminal Station			Y	Complete
Horsham Terminal Station		Y	Y	Complete
Dederang Terminal Station			Y	Deferred
Bendigo Terminal Station		Y	Y	Complete 2007/08
Redcliffs Terminal Station		Y	Y	Complete 2007/08
Terang Terminal Station			Y	Complete 2007/08
Mount Beauty Terminal Station		Y	Y	66 kV Complete 220kV Complete 2007/08
Malvern Terminal Station	Y	Y	Y	Underway

Source: SP AusNet

3.5.4 Other Planned Programs

Other key programs that SP AusNet planned to undertake and were completed during the current regulatory period, are outlined below.

Installation of Optical Fibre Ground Wire	The optical fibre ground wire installation program incorporated the integrated replacement of transmission line overhead ground wires and power line carrier equipment with new optical fibre embedded in transmission line overhead ground wire (OPGW), between various terminal station sites and central control and monitoring locations. The installation of OPGW represented the least cost solution to: ▪ provide the critical communications signals for protection and control for parts of the network, ▪ ensure compliance with the operational requirements of the NER; and ▪ enable enhanced monitoring and information management at terminal station sites.
Water and Oil Management Program	This environmental program facilitated the improvement of civil infrastructure to reduce the possibility of escape of oil or contaminants offsite or into groundwater in the event of an emergency. These works ensured that SP AusNet complies with relevant legislation, regulation, statutory policy and good environmental management practices for the management of oil and water at sites. The scope of work included the installation of drainage, storm water, oil containment and oil collection and treatment at terminal stations and other sites where oil is handled or stored.
Circuit Breaker Replacement Program	The circuit breaker replacement program covered various projects for the replacement of 220 kV and 66 kV circuit breakers due to their condition or performance. The projects covered replacement of circuit breakers at sites where station refurbishments were not required for a number of years, and where it was more cost effective to replace these selected circuit breakers on an individual basis. In some cases the replacements were also used to provide critical spares to keep other circuit breakers of the same type in service, thereby extending the life of these remaining assets.

3.5.5 Major Unanticipated Projects

SP AusNet has had to address unforeseen events in its capital program over the current period, and has undertaken the required expenditure within its existing allowance without compromising its forecast replacement program. This is not unexpected in a large complex transmission network, and capital expenditure allowances must be flexible enough to recognise the changing priorities that may occur in expenditure over a five-year period.

SP AusNet's asset management and capital management processes allow these projects to be incorporated into the work plans on a continual basis.

The major unanticipated projects completed over the current regulatory period are listed below.

Tower Safe Access Program	In 2001, an SP AusNet worker suffered a fatal injury during line work. The subsequent inquiry identified a design weakness on some of SP AusNet's older towers, which resulted in an unacceptable health and safety risk to its linesmen. In response, SP AusNet initiated the Tower Safe Access program, which included an additional **$16.8 million** of unanticipated and unbudgeted expenditure over the current period. This program covered a group of projects required to ensure that line-workers can safely access transmission line towers without encroaching on electrical safety clearances. The work involves the installation of signs, access ladders, safety screens and anti fall devices on transmission line towers. The work has been designed to conform to the National Guidelines for safe approach distances to electrical apparatus. This program is expected to continue into the next regulatory control period.
Richmond Terminal Station	The Richmond Terminal Station 22 kV switchyard was not scheduled for major replacement works during the 2003 - 2008 period. However, in 2004, investigations by geotechnical consultants revealed the 22 kV Switchyard to be subsiding. This has required the rebuilding of the 22 kV Switchyard at an alternative location on the site at a cost of **$6.0 million**.
Station Security Upgrade	In response to world events since September 11 in 2001, critical infrastructure such as the transmission system has become a focus of security assessments. These assessments have resulted in the *National Guidelines for Protecting Critical Infrastructure from Terrorism* and *ENA/ESAA Guidelines for Prevention of Unauthorised Access to Electricity Infrastructure*. In response, SP AusNet initiated a capital program in order to comply with these new guidelines. This program consisted of **$15.8 million** of capital expenditure to upgrade fencing, access and monitoring of transmission sites. This program is expected to continue into the next regulatory control period.
CT replacement program	This program covered the replacement of high voltage oil filled instrument transformers due to deterioration of primary insulation. Failures, including explosive failures at some stations, and test results showed some unexpected and serious problems with particular fleets used on the SP AusNet network. A replacement program was put in place to remove the fleets from service. As a result, an extra **$10.1 million** was committed to this program. This program is expected to continue into the next regulatory control period.

3.5.6 Prudent Capital Expenditure: Concluding Remarks

SP AusNet is confident that the AER's review will confirm that actual capital expenditure undertaken over the current regulatory period has been prudent, and meets the requirements for incorporation into the regulatory asset base. As noted in further detail in Chapter 5, SP AusNet has substantially delivered its planned capex program within 9 percent of the expenditure allowance provided in the revenue cap, despite upward cost pressures and unforeseen demands on capital during the current regulatory control period. At a detailed level it can be demonstrated that SP AusNet:

- has a best-practice Asset Management Strategy in place which ensures that planned investment achieves the objective of providing network services in accordance with customers' needs at the lowest possible total cost;
- has robust and effective systems for the detailed assessment and approval of each project;
- has robust systems in place for the tracking and control of project implementation costs. Upon completion of a project, the scope for process improvements are identified for future projects, and the improvements are implemented; and
- can provide detailed cost data to reconcile any differences between expenditures and outcomes approved in a business case and actual project outcomes.

As noted in further detail in Section 3.6, SP AusNet performs well compared to its peers against a range of partial performance indicators and benchmarks. Whilst these measures focus on maintenance costs, SP AusNet's good performance against such measures further substantiate that SP AusNet's asset management processes and its work delivery processes are prudent and efficient.

As noted in section 3.1, information supplementing SP AusNet's original Revenue Proposal in relation to this matter has been provided in section 1.2 of Appendix H.

3.6 Benchmarking

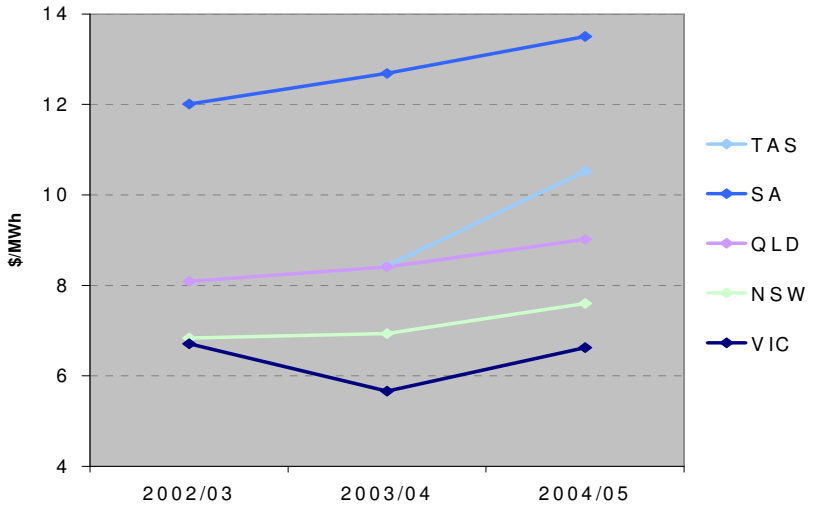
SP AusNet continues to deliver a low-priced, high quality transmission service through strong cost-control and high levels of network performance. The evidence presented below is assembled from internal sources and external industry surveys and confirms that SP AusNet's operational performance places it at the forefront of the transmission sector in Australia. It also provides confidence to stakeholders that the proposed expenditure in the forthcoming regulatory period is efficient, and consistent with delivering appropriate compliance and service outcomes.

3.6.1 Transmission Price Benchmarks

The price of transmission in Victoria per megawatt hour (MWh) is currently the lowest in Australia, and on the basis of this revised Revenue Proposal, will continue to be the lowest. The Victorian electricity customer is unquestionably reaping the rewards of:

- the State's long-standing commitment to a well-designed and well-maintained transmission network; and
- SP AusNet's prudent and efficient asset management and operational practices.

Figure 3.6.1 Transmission Charge 2002/03 to 2004/05 (Nominal)



Note: effects of the Victorian easement land tax are excluded.

Source: SP AusNet using AER TNSP Comparison Reports.

3.6.2 Operating Expenditure Cost Benchmarks

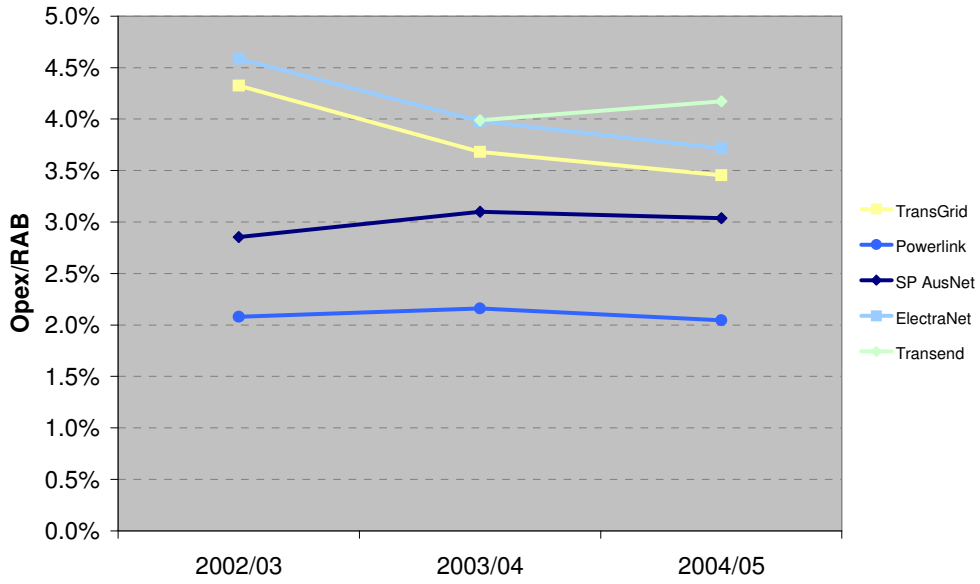
There has been increasing prominence given to benchmarks by the AER in more recent revenue decisions. However, the AER has also recognised that:

> comparisons based on partial measures are not very meaningful. Nevertheless, different measures used in combination can help to assess whether a TNSP's opex is reasonable.[13].

The AER reviews the performance of each TNSP, and provides stakeholders with access to comparative data on the financial and service performance of each respective TNSP. Using the information from the AER's comparative reports SP AusNet has determined partial measures on: opex/RAB, opex/GWh, opex/line length and opex/substation for each respective TNSP between the years 2002 / 03 to 2004 / 05. Figures 3.6.2 and 3.6.3 illustrate SP AusNet's strong performance on the opex/RAB and opex/GWh measures.

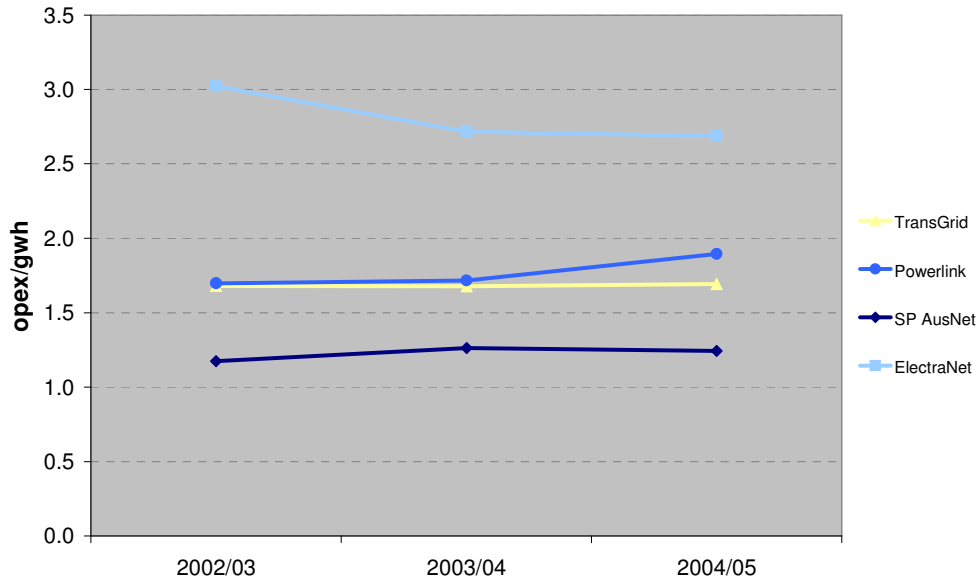
[13] The NSW and ACT Transmission Revenue Cap TransGrid 2004/2005 to 2008/09: Draft Decision (page 33)

Figure 3.6.2 Opex/RAB (Nominal)



Source: SP AusNet using AER TNSP Comparison Reports.

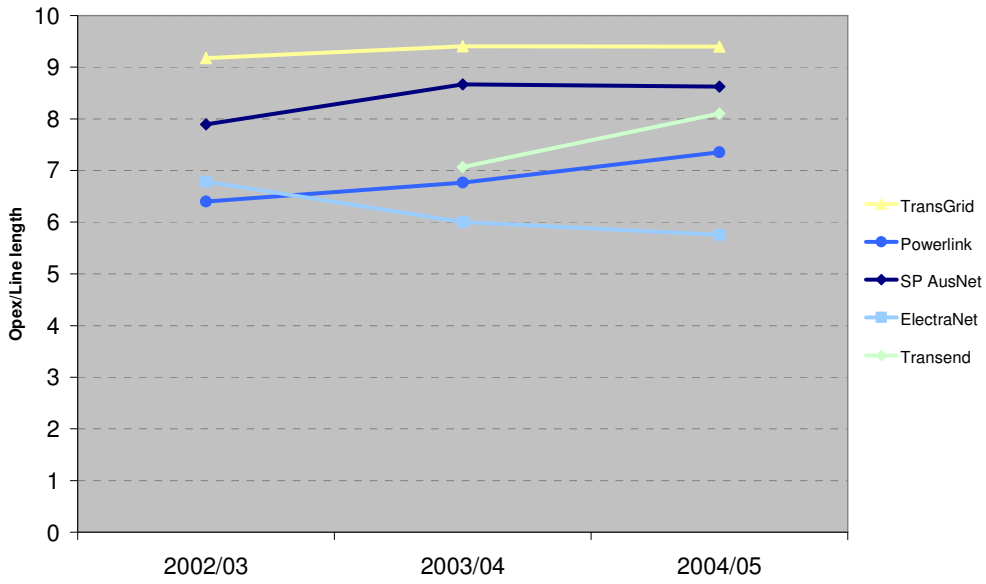
Figure 3.6.3 Opex/GWh (Nominal)



Source: SP AusNet using AER TNSP Comparison Reports.

Figure 3.6.4 illustrates SP AusNet's performance on the opex/line length ratio. SP AusNet has a highly meshed network and denser energy usage patterns compared to other TNSPs which means that opex costs are spread across far fewer kilometres of lines to transfer power from generators to customers. Therefore, SP AusNet does not perform as well on this ratio.

Figure 3.6.4 Opex/Line length (Nominal)



Source: SP AusNet using AER TNSP Comparison Reports.

An equivalent measure to the opex/line length ratio would be SP AusNet's opex performance on non-line assets such as opex per number of maintenance units installed (CBs, transformers, reactive plant) and/or opex per nominal MVA capacity of transformers installed.

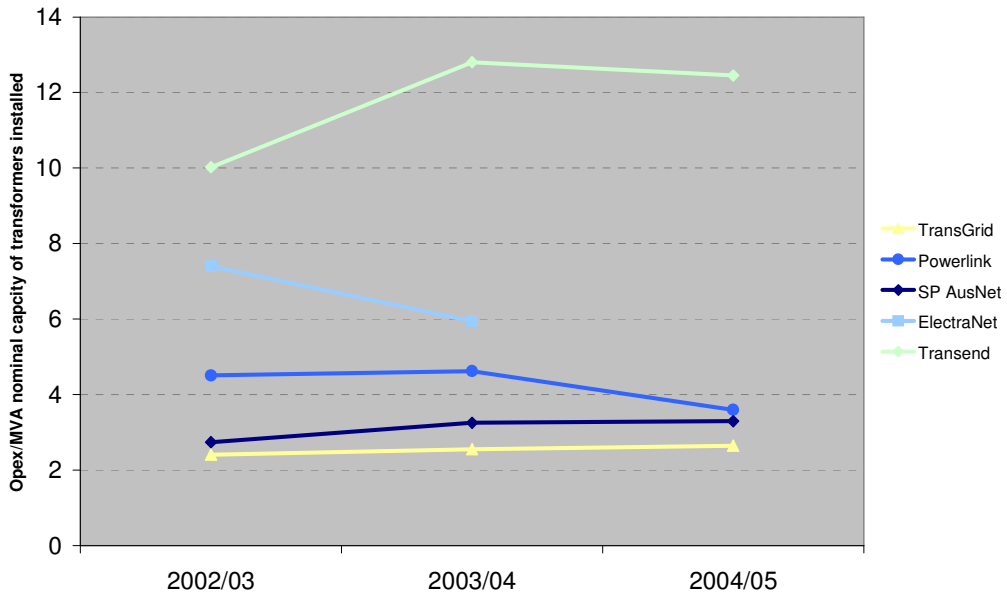
However, the AER has adopted the opex/substation ratio as an equivalent measure. SP AusNet does not believe that the number of substations provides an appropriate representation of the opex requirements of a TNSP in maintaining its substation assets and therefore this measure does not provide a meaningful metric of costs incurred by a TNSP.

Substations differ markedly in size between TNSPs, reflecting the location of load centres, the load density in various States, and decisions regarding the optimum sizing to meet security needs in the desired manner. The number of substations is not a particularly robust measure as a basis for assessing operating cost requirements. Operating expenditure is more closely related to actual numbers of individual items of equipment or the actual capacity of the equipment, which are required to be maintained.

Operating expenditure per maintenance units installed, however, is not publicly available, and hence comparisons between businesses cannot be made. A potential surrogate measure, which involves publicly available information, is opex per nominal MVA capacity of transformers installed. This information is contained in the ESAA publication of *Electricity Gas Australia 2006*.

Figure 3.6.5 clearly illustrates that SP AusNet performs far better using the measure of opex per MVA capacity of transformers installed.

Figure 3.6.5: Opex/Nominal MVA capacity of transformers installed (Nominal)



Source: SP AusNet using AER TNSP Comparison Reports and ESAA Electricity Gas Australia 2006

3.6.3 International Cost / Performance Benchmarks

SP AusNet has for some time now participated in the International Transmission Operations & Maintenance Study (ITOMS) conducted by a consortium of international transmission companies as a means of comparing performance and practices within the transmission industry worldwide. The most recent ITOMS study in 2005 includes SP AusNet data for its 2004 / 2005 financial year.

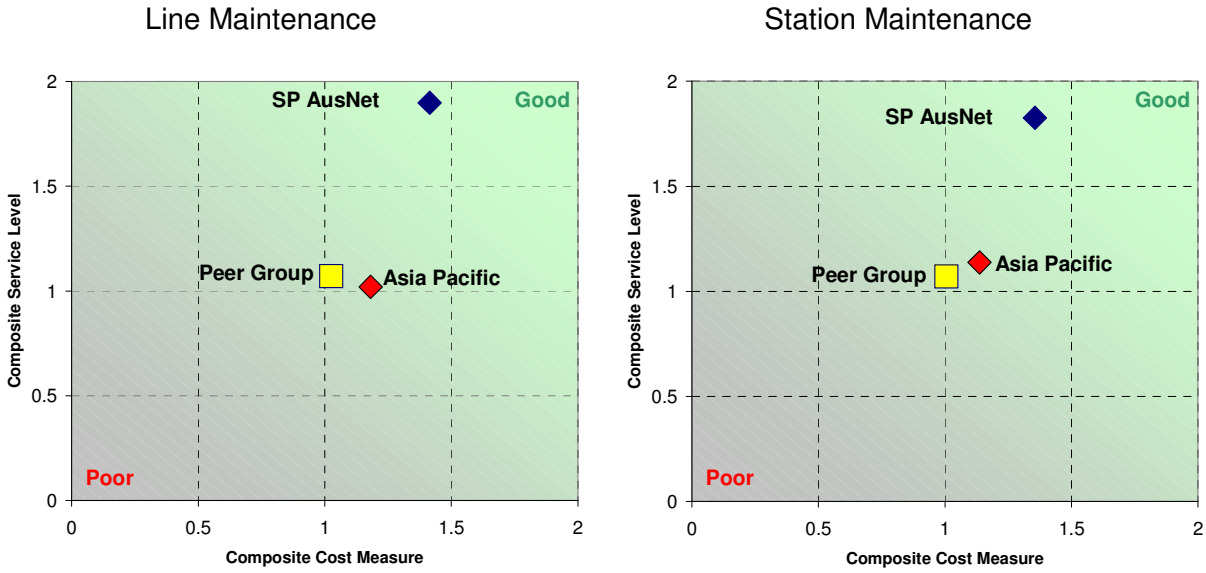
The independent study involves companies from the Asia Pacific, Europe and North America. It focuses on competing indicators of cost (operations and maintenance) and service performance (network reliability). Benchmarking results are presented as a cross plot of reliability and cost.

This benchmarking recognises that cost and reliability cannot be considered in isolation. As indicated in Figure 3.6.6, SP AusNet delivers a high level of network reliability, whilst also ensuring low costs. The level of reliability is the highest in Australia.

The study confirms SP AusNet's continuing 'top quartile' performance in transmission line related maintenance and terminal station related maintenance amongst international TNSPs.

Figure 3.6.6 compare SP AusNet's performance with the averages of international peers (companies with similar asset profiles to SP AusNet) and Asia Pacific peers (including Australia and New Zealand) in transmission line maintenance and station-related maintenance respectively.

Figure 3.6.6 Transmission Line and Station Maintenance



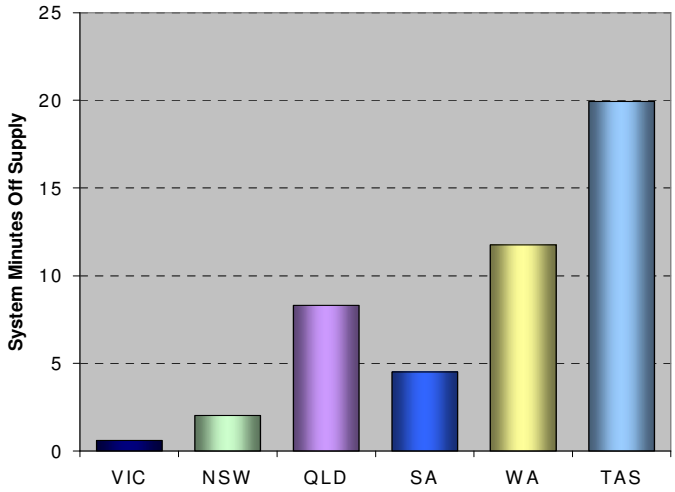
Source: International Transmission Operations & Maintenance Study (ITOMS)

3.6.4 System Reliability Benchmarks

While SP AusNet's business operations are extremely cost-efficient, the company recognises that overall efficiency must also be gauged by observing service delivery performance.

Benchmarking studies confirm that SP AusNet's reliability and network service performance has not been diminished as a result of its low cost of operations. The reliability of SP AusNet's network is best measured by reference to system minutes off supply. Figure 3.6.7 illustrates that SP AusNet has achieved the lowest system minutes off supply on average in Australia over the period 2001 / 02 to 2004 / 05.

Figure 3.6.7 System minutes off supply on average 2001/02 to 2004/05



Source: ESAA, SP AusNet

4 Operational Service Outputs and Compliance Obligations

4.1 Introduction

This chapter describes:

- the operational service targets that SP AusNet is planning to deliver during the forthcoming regulatory control period; and
- the mandatory obligations with which SP AusNet must comply during the forthcoming regulatory control period.

These service targets and mandatory compliance obligations effectively define the outputs that SP AusNet will deliver over the forthcoming period. The quality and level of these outputs is an important determinant of the capital, operating and maintenance costs that the company expects to incur over the forthcoming period[14].

In relation to service standards, it is noted that clause 6A.7.4 of the NER requires the Australian Energy Regulator (AER) to establish a service target performance incentive scheme. The AER has indicated that it will continue to use the measures used for the performance incentive scheme that has applied in the current regulatory control period. In setting new targets for these measures, it has proposed some modifications that will apply for the forthcoming regulatory control period.

In addition, SP AusNet has continued the availability incentive scheme with its major customer, VENCorp, entered into in 2002. Under this agreement, SP AusNet pays VENCorp an availability rebate for outages of main transmission network elements on the shared network.

In its Draft Decision, the AER proposed a number of changes to the service incentive scheme and the availability incentive scheme as presented by SP AusNet's in its original Revenue Proposal. In this Chapter, SP AusNet has developed revised proposals in respect of both schemes that give careful consideration to the issues raised by the AER in its Draft Decision.

The remainder of this chapter is structured as follows:

- Section 4.2 describes SP AusNet's performance under the existing scheme for the current control period;
- Section 4.3 describes the AER's mandated changes to the scheme;
- Section 4.4 sets out SP AusNet's proposed targets and weightings for the incentive arrangements to apply for the forthcoming regulatory control period, which take account of the issues raised by the AER in its Draft Decision;
- Section 4.5 provides a description of the availability scheme agreed with VENCorp, and explains SP AusNet's proposed approach to this scheme in light of the AER's Draft Decision;
- Section 4.6 concludes the chapter by providing an overview of the mandatory standards and obligations with which SP AusNet must comply.

Interested parties should be aware that SP AusNet submitted supplementary information in relation to the availability incentive scheme and proposed performance incentive scheme parameters to the AER on 30 April 2007. The information supplements that contained in SP AusNet's original Revenue

[14] Capital and operating expenditure forecasts (based on the application of the asset management processes described in Chapter 3, and the planned service outputs and compliance obligations (described in this Chapter 4) are set out in detail in Chapters 5 and 6, respectively.

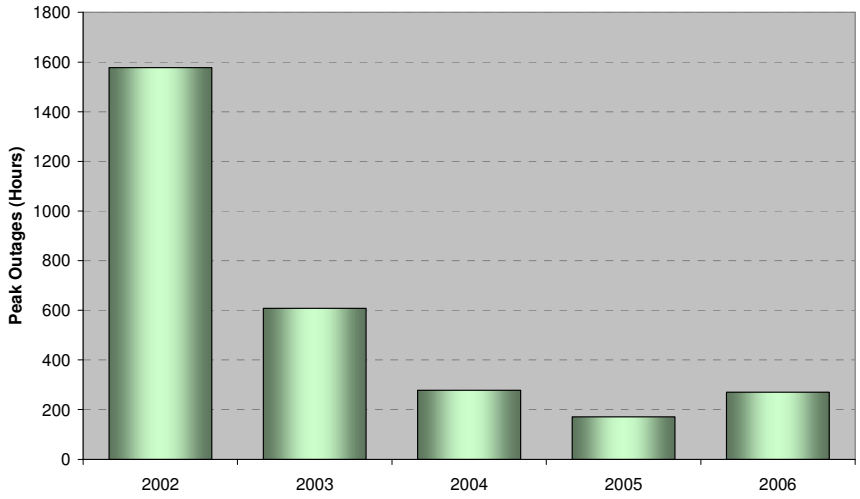
Proposal, and was submitted in response to a request issued by the AER pursuant to clause 6A.11.1 of the NER. For ease of reference, this supplementary information is set out in Appendix H. Supplementary information relating to the availability incentive scheme is set out in section 1.5 of Appendix H, while supplementary information regarding proposed performance incentive scheme parameters is provided in section 1.8 of Appendix H.

4.2 Current Performance Against AER Service Standards

SP AusNet is strongly committed to achieving the highest possible operational performance when implementing its opex and capex programs. SP AusNet was the first Transmission Network Service Provider (TNSP) to implement an incentive scheme on outage management in 1994 and was the first TNSP to be subject to the AER service standards scheme in 2003. The company has responded to these incentives with improved outage management and planning, ensuring less disruption and risk to customers from maintenance and construction activities.

Since their introduction, the AER scheme and the more targeted VENCorp availability incentive scheme have driven desirable outcomes in operational performance. For example, peak outage hours (during the summer demand peak) have fallen dramatically since the introduction of both schemes in 2003 (refer Figure 4.2.1). This illustrates the importance SP AusNet places on ensuring the transmission system capacity is available during times that are most likely to be important to the National Electricity Market, therefore, helping minimise market prices at these times and greatly improving the security of supply to customers.

Figure 4.2.1: Peak Outages

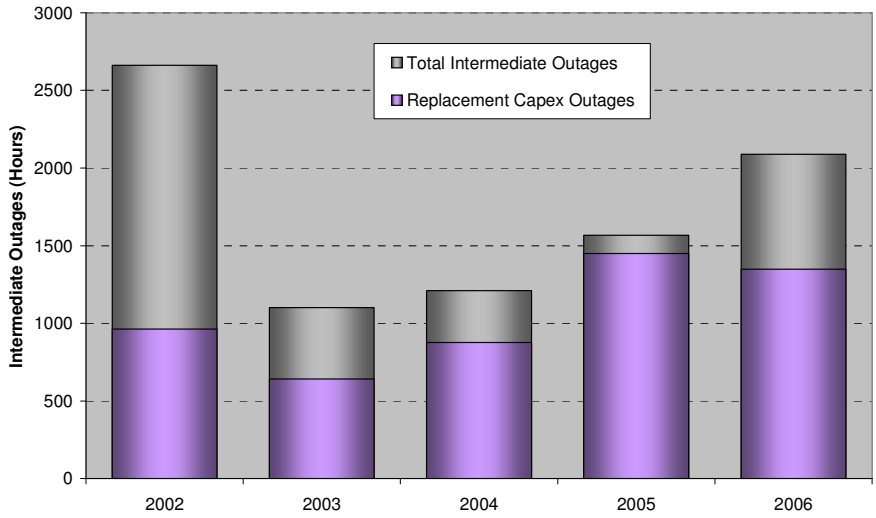


Source: SP AusNet

However, SP AusNet has faced increasing challenges in the intermediate period (the winter demand peak). After an initial fall in outages in response to the incentives in the scheme, the increasing capex program combined with increasing network utilisation has impacted on intermediate outages (refer Figure 4.2.2).

In particular, the increasing capex program for both replacement of assets and customer augmentation has meant that outage windows in off-peak periods are becoming fully utilised. This means, SP AusNet has had no choice but to intentionally push some outages into intermediate periods.

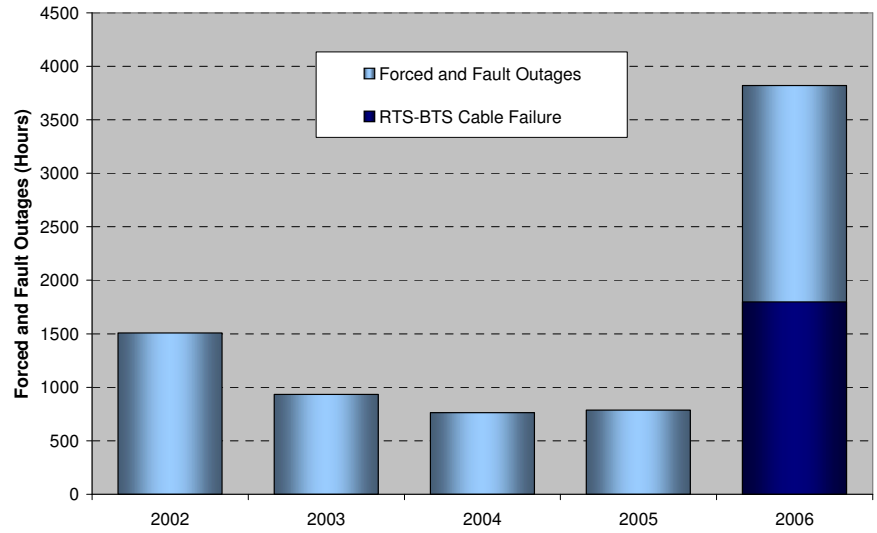
Figure 4.2.2: Intermediate Outages



Source: SP AusNet

It should also be noted that the number of forced outages has fallen, indicating that SP AusNet's performance against targets is not attributable to a reduction in reliability (refer Figure 4.2.3). The exception to this observation is 2006, which was affected by a single major fault on the Richmond to Brunswick 200 kV cable. The large amount of time associated with the excavation work required to locate and repair this fault accounted for 47 percent of 2006 forced outage hours.

Figure 4.2.3 Forced and Fault Outages



Source: SP AusNet

Under the existing scheme for the current regulatory control period, SP AusNet has 0.5 percent of its revenue at risk spread across five availability measures and two average forced outage duration measures. SP AusNet also reports performance against two thresholds for the loss of supply event frequency index. These measures, the associated targets, and SP AusNet's performance against them, are shown in Table 4.2.1.

A number of availability targets have not been met in the current period because additional planned outages have been required in order to undertake the increased capital expenditure and maintenance work programs. The performance targets established by the ACCC in 2002

for the current regulatory control period were based on historic data from a period with substantially lower levels of capital and maintenance works.

Table 4.2.1: Performance incentive scheme – performance against targets

	Target	2003	2004	2005	2006	Weight
Availability Measures	**%**					**%MAR**
Total Circuit Availability	99.20	99.323	99.269	99.341	99.257	0.1
Peak Critical Availability	99.90	99.787	99.974	99.945	99.878	0.075
Peak Non-critical Availability	99.85	99.841	99.571	99.857	99.787	0.025
Intermediate Critical Availability	99.85	99.479	99.804	99.745	99.556	0.025
Intermediate Non-critical Availability	99.75	99.338	99.394	98.21	98.765	0.025
Loss of Supply Event Index	**No.**					
>0.05 min per annum	2	3	2	5	5	0
>0.3 min per annum	1	0	0	2	3	0
Average Outage Duration	**hours**					
Lines	10	9.978	2.73	7.542	33.379	0.125
Transformers	10	7.659	4.862	6.644	7.692	0.125

Source: SP AusNet

4.3 AER Mandated Changes to the Existing SP AusNet Scheme

SP AusNet currently excludes all outages associated with augmentation of the network from its measures. The exclusion of planned outages in this way is consistent with the basis on which the initial targets for the scheme were set. This was considered appropriate because SP AusNet is not responsible for planning the augmentation of the Victorian transmission network or the outages associated with these construction projects.

The AER has requested that the definition of exclusions under the SP AusNet scheme be brought into alignment with that of the other Transmission Network Service Providers.

Therefore, SP AusNet's service standards targets for the forthcoming regulatory control period will include:

- predicted planned outages of shared network associated with VENCorp augmentation;
- predicted planned outages of shared network outages requested by connected parties; and
- an allowance for other planned third party-initiated outages.

As a result, availability targets for the new period will be lower than for the current period, as new categories of outages are included in the scheme.

SP AusNet proposes continuing current practice under which revenue (for the purposes of determining revenue at risk under the scheme) is defined as excluding the easement tax due to the exogenous nature of that tax.

4.4 Proposed Operational Service Standards

Under Clause S6A.1.3 of the NER, SP AusNet must propose targets for the AER's service target performance incentive scheme (STPIS). This section sets out the targets proposed by SP AusNet for the forthcoming regulatory control period, and describes the derivation of those targets. The methodologies applied to derive the targets are in accordance with the NER and the AER's Service Standards Guidelines.

4.4.1 Overview of SP AusNet's original Revenue Proposal

SP AusNet's original Revenue Proposal contained the targets and proposed weightings shown in Table 4.4.1 below.

Table 4.4.1 Performance incentive scheme – new targets for the forthcoming regulatory control period, original Revenue Proposal

	Collar	Target	Cap	Weight
Availability Measures		**%**		**%MAR**
Total Circuit Availability	98.38	98.68	98.84	0.200
Peak Critical Availability	98.51	99.28	99.67	0.200
Peak Non-critical Availability	98.87	99.36	99.60	0.050
Intermediate Critical Availability	97.11	98.49	99.19	0.025
Intermediate Non-critical Availability	97.25	98.62	99.30	0.025
Loss of Supply Event Index		**No.**		
>0.05 min per annum	7	4	3	0.125
>0.3 min per annum	4	3	2	0.125
Average Outage Duration		**Hours**		
Lines	12	7	4	0.125
Transformers	10	7	6	0.125

Source: SP AusNet

During the review process, discussion on data issues and analysis between PB, the AER and SP AusNet resulted in the modified targets set out in Table 4.4.2 being submitted.

Table 4.4.2 Performance incentive scheme – modified targets for the forthcoming regulatory control period, original Revenue Proposal

	Collar	Target	Cap	Weight
Availability Measures	**%**	**%**	**%**	**%MAR**
Total Circuit Availability	98.36	98.67	98.83	0.200
Peak Critical Availability	38.51	99.28	99.67	0.200
Peak Non-critical Availability	98.78	99.35	99.64	0.050
Intermediate Critical Availability	97.12	98.50	99.19	0.025
Intermediate Non-critical Availability	97.49	98.64	99.22	0.025
Loss of Supply Event Index		**No.**		
>0.05 min per annum	8.64	5.64	4.14	0.125
>0.3 min per annum	3.63	1.32	0.17	0.125
Average Outage Duration		**hours**		
Lines	11.11	6.37	4.00	0.125
Transformers	9.27	6.87	5.67	0.125

Source: SP AusNet

SP AusNet also proposed the following exclusions:

- Outages on shunt reactors (for peak targets only);
- Outages required to control voltage;
- Clarification of the third party outages exclusion definition;
- Brunswick to Richmond 220kV Planned Maintenance Cable Outages;
- Customer works relating to:
  - *Fault Level Mitigation Works;*
  - *Line Up-rating;*
  - *Interconnector Upgrades; and*
  - *Switchyard Busbar Up-rating.*

4.4.2 Overview of the Draft Decision

The AER has accepted SP AusNet's weightings but proposed the alternative targets shown in Table 4.4.3 below.

Table 4.4.3: Performance incentive scheme –targets for the forthcoming regulatory control period proposed in the Draft Decision

	Collar	Target	Cap	Weight
Availability Measures	**%**	**%**	**%**	**%MAR**
Total Circuit Availability	98.41	98.73	99.05	0.200
Peak Critical Availability	98.76	99.53	99.92	0.200
Peak Non-critical Availability	98.95	99.53	99.81	0.050
Intermediate Critical Availability	97.71	99.09	99.78	0.025
Intermediate Non-critical Availability	97.94	99.10	99.68	0.025
Loss of Supply Event Index		**No.**		
>0.05 min per annum	9	6	3	0.125
>0.3 min per annum	4	1	0	0.125
Average Outage Duration		**Minutes**		
Lines	667	382	98	0.125
Transformers	556	412	268	0.125

Source: Draft Decision

The AER's response on each of the exclusions proposed by SP AusNet is shown below.

Proposed Exclusion	Draft Decision
Outages on shunt reactors (for peak targets only)	Accepted
Outages required to control voltage	Accepted
Third party outages exclusion definition	Rejected
BTS to RTS 220kV Planned Maintenance Cable Outages	Rejected
Fault Level Mitigation Works	Accepted
Line Up-rating	Rejected
Interconnector Upgrades	Rejected
Switchyard Busbar Up-rating	Rejected

Source: Draft Decision

4.5 SP AusNet's response to the Draft Decision

The targets described in SP AusNet's original Revenue Proposal have been revisited by SP AusNet in light of the AER's Draft Decision. Further details of SP AusNet's responses to the matters raised in the Draft Decision are set out in sections 4.5.1 to 4.5.4 below. Details of SP AusNet's revised proposed targets for the service target performance incentive scheme are set out in section 4.4.9.

4.5.1 Availability Measures

Transmission circuit availability is the percentage of time that each transmission element is available during the year. An element of plant may be unavailable due to:

- planned outages required to enable SP AusNet to perform maintenance or construction (capex); or
- unplanned outages related to faults on equipment.

Planned outages represent the majority of outage time for the Victorian transmission system.

Targets for availability are calculated from a combination of the average historical availability from 2002 to 2006 and forecast outages arising from the capex and opex proposals, including allowances for outages required by VENCorp, connected parties and other third parties. The category of outages and the method of calculation are outlined in Table 4.5.1.

Table 4.5.1: Calculating availability targets

Type of outage	Method of calculation
Planned routine maintenance outages	2002-2006 historical average
Forced and fault outages	2002-2006 historical average
SP AusNet planned asset works outages	2002-2006 historical average (with specific exclusions)
SP AusNet planned capex outages	Forecast from capex plans
Augmentation capex outages	Forecast from VENCorp and customer capex plans

Source: SP AusNet

Outages from these categories are summed and compared with total plant hours available to generate the total availability targets for each year of the forthcoming regulatory control period. Outages are then classified into critical and non-critical categories and distributed into peak, intermediate and off-peak periods using historical patterns. The transmission network work program is planned to ensure the maximum availability of the network at peak times, to minimise the impact on customers.

To achieve this, work is scheduled first by filling up the off-peak periods available, then the intermediate period, and finally, the peak period. This approach reflects the importance of the peak and intermediate periods to customers compared to the off-peak period.

Caps are placed above the target by an amount equal to one standard deviation from the historical average, while collars are placed below the target by an amount equal to two standard deviations from the historical average. The asymmetry reflects the fact that performance is already high and, therefore, improvements are more difficult to achieve than performance reductions.

This asymmetry was recognised by the AER (ACCC) in its 2003 *Final Decision on Service Standards Guidelines*:

> "… the ACCC recognises that TNSPs may already be operating at a high-level of performance. For example, most TNSPs in Australia have a circuit availability rate of more than 99 per cent. At this level, for a particular TNSP, improvements of a certain magnitude could be harder than a similar deterioration. Therefore the gradient of the reward would be greater than that of the penalty" (p 10)

In its original Revenue Proposal, SP AusNet proposed the availability targets set out in Table 4.4.2 above. The AER appointed PB to review SP AusNet's proposed availability targets, and as a result of that review PB recommended a number of changes which were accepted by the

AER in its Draft Decision. SP AusNet has carefully considered the AER's amended availability targets as set out in table 7.9 of the Draft Decision on page 213. In response to matters relating to availability measures that are raised in the Draft Decision, SP AusNet's comments are as follows:

Draft Decision Targets

The Draft Decision's availability targets are dependent both on the total number of outage hours forecast and the split of those outages into peak, intermediate and off-peak periods. The forecast outages making up a single target can also be split into four categories – forced and fault; SP AusNet initiated capex; SP AusNet opex; and customer augmentation.

In allocating outage hours associated with SP AusNet initiated capex to peak intermediate and off-peak periods, SP AusNet has implemented the Draft Decision with regard to the number of forecast outage hours used to calculate availability targets for the forthcoming regulatory control period for all categories of outages.

SP AusNet has also implemented the Draft Decision with regard to the split of outage hours used to calculate availability targets for the forthcoming regulatory control period for forced and fault outages, SP AusNet opex and customer augmentation.

However, SP AusNet has **not** implemented the Draft Decision with regard to the allocation of those hours into peak, intermediate and off-peak periods for SP AusNet initiated capex. SP AusNet's position on each of these matters is shown in Table 4.5.2 below.

Table 4.5.2: Implementation of Draft Decision Availability Targets in Revised Proposal

Outage Category	Implemeneted Draft Decision	
	Forecast Outage hours	Peak/Intermediate/ Off-peak Splits
Forced and Fault	Yes	Yes
SPA initiated Capex	Yes	No
SPA Opex	Yes	Yes
Intermediate Critical Availability	Yes	Yes
Customer Augmentation	Yes	Yes

Source: SP AusNet

The reasons for SP AusNet not implementing the Draft Decision with regard to the allocation of outage hours into peak, intermediate and off-peak periods for SPA initiated capex are set out in the next section.

Allocation of forecast SP AusNet initiated capex outages to peak, intermediate and off peak periods

This issue relates to the treatment of historical data used to establish the percentage allocation of outages into peak, intermediate and off-peak periods. These percentages were used on the forecast outages for each of the four categories of outages – forced and fault; SP AusNet initiated capex; SP AusNet opex; and customer augmentation. As noted above, the specific issue relates to SP AusNet initiated capex outages only.

In allocating outage hours associated with SP AusNet initiated capex to peak intermediate and off-peak periods, SP AusNet mistakenly relied on historical data including opex and capex outages to calculate the percentage split. For example, the calculation of the percentage of peak outage hours used the formula set out below:

$$\% \text{ of Peak Outage Hours} = \frac{\text{Historical Peak Outages (all reasons)} \times 100}{\text{Historical Total Outages (all reasons)}}$$

PB considered that this allocation should be based only on the SP AusNet initiated capex outages and recalculated the percentage split accordingly. The AER accepted PB's recommendation. SP AusNet also accepts that PB's recommendation is correct, however, it does not believe that PB has performed the calculation correctly. PB has removed opex and forced and fault outages from the peak and intermediate hours but not the total outages as set out below:

$$\% \text{ of Peak Outage Hours} = \frac{\text{Historical Peak Outages (capex)} \times 100}{\text{Historical Total Outages (all reasons)}}$$

However, if capex outages alone are to be used to calculate these percentage splits, other outages must be consistently removed from both the numerator and denominator as set out below:

$$\% \text{ of Peak Outage Hours} = \frac{\text{Historical Peak Outages (capex)} \times 100}{\text{Historical Total Outages (capex)}}$$

Therefore, SP AusNet has recalculated the percentage split between peak, intermediate and off-peak outages for its revised proposal using the PB methodology but consistently and correctly using only the distribution of capex outages. The results are shown in Table 4.5.3 below. A detailed breakdown is shown in Appendix I.

Table 4.5.3: Distribution of SP AusNet initiated capex outages into peak, intermediate and off-peak periods

	SP AusNet Proposal	PB Recommendation	SP AusNet Revised Proposal
Outage Type	**%**	**%**	**%**
Peak	4.00	1.89	3.78
intermediate	13.00	6.02	12.04
Off Peak	83.00	92.09	84.18

Source: SP AusNet, PB Report

Calculation of final adjustments

Application of the corrections described above results in changes to the targets. SP AusNet's adjustments for the purpose of this revised Revenue Proposal are shown in Table 4.5.4 below. The table includes a comparison with the adjustments recommended by PB which underpin the Draft Decision.

Table 4.5.4: Revised adjustments to availability targets for the purpose of the revised Revenue Proposal

Availabilty Measures	PB's Recommended Adjustements			SP AusNet Revised Proposal		
	Customer works	SP AusNet Capex	Total	Customer works	SP AusNet Capex	Total
	%	%	%	%	%	%
Total circuit	0.002	-0.424	-0.421	0.002	-0.423	-0.422
Peak critical	-0.079	-0.013	0.092	-0.079	-0.165	-0.244
Peak non-critical	0.008	-0.043	-0.035	0.008	-0.173	-0.165
Intermediate critical	0.020	-0.099	-0.079	0.019	-0.533	-0.514
Intermediate non-critical	-0.021	0.073	0.052	-0.021	-0.300	-0.321

Assumes exclusions are approved.

Source: SP AusNet Proposal, PB Report

SP AusNet has submitted detailed spreadsheets supporting these calculations to the AER separately at the time of lodging this revised Revenue Proposal.

4.5.2 Calculation of outages associated with exclusions

SP AusNet sought exclusions for work associated with certain types of customer works. PB has recommended that outages associated with this work not be excluded in two instances.

Discussion on the merits of retaining these exclusions is outlined in section 4.4.10 below. SP AusNet is concerned that PB has rejected the exclusions **and** not included the outage hours associated with this work from its recommended targets for SP AusNet.

SP AusNet submits that either an exclusion should be granted, or the forecast hours associated with that work should be included in any targets set by the AER.

SP AusNet sets out the outages associated with this work in Table 4.5.5 below.

Table 4.5.5: Change in percentage targets associated with requested exclusions

Availability Measure	Interconnector upgrade	Line up-rating	Busbar uprating
	%	%	%
Total Circuit Availability	-0.003	-0.029	0.0
Peak Critical Availability	-0.004	-0.044	0.0
Peak Non-critical Availability	-0.001	-0.015	0.0
Intermediate Critical Availability	-0.005	-0.052	0.0
Intermediate Non-critical Availability	-0.001	-0.013	0.0

Source: SP AusNet

SP AusNet has submitted detailed spreadsheets supporting these calculations to the AER separately at the time of lodging this revised Revenue Proposal.

4.5.3 Loss of Supply Event Index

The *Loss of Supply Frequency Event Index Measures* directly impacts on customers from a TNSPs operational performance. This performance measure captures the number of events that result in a moderate loss of supply (0.05 system minutes) and a large loss of supply

(exceeding 0.3 system minutes). It is a direct measure of the impact of network performance on network reliability. SP AusNet's thresholds are lower than other TNSPs as the Victorian network delivers higher levels of reliability.

SP AusNet has not previously placed revenue at risk on this measure due to concerns over the quality of its historical data. For this regulatory period, reliable data has been reported to the AER for 2003 to 2006. This has formed the basis of new targets, against which, SP AusNet is confident placing revenue at risk[15].

The proposed targets are calculated using the historical average adjusted for the increase in the capex program. This adjustment is justified, as there is a direct relationship between the amount of work performed on the network and interruptions to supply.

As for the availability measures, caps are placed above the target by an amount equal to one standard deviation from the historical average, while collars are placed below the target by an amount equal to two standard deviations from the historical average.

In its original Revenue Proposal, SP AusNet proposed targets for the loss of supply event frequency index as described in Table 4.4.4 below. The AER appointed PB to review SP AusNet's proposed targets, and as a result of that review PB recommended a number of changes which were accepted by the AER in its Draft Decision. SP AusNet has carefully considered the AER's amended targets as set out in table 7.9 of the Draft Decision on page 213. SP AusNet has implemented the Draft Decision's proposals in relation to Loss of Supply Index targets.

4.5.4 Average Outage Duration Measures

The average outage duration measures the average amount of time SP AusNet takes to return a piece of plant to service after a fault. The targets for the current regulatory control period were chosen to match the benchmarks set out in the Victorian Transmission System Code, they were established using long-term historical data.

SP AusNet's proposed targets have been set using the historical data from 2002 to 2006. The Company is also proposing a cap on individual events (events above the proposed cap have been excluded from the data used to set the historical averages). This cap ensures that one event cannot dominate the measured performance, therefore destroying the incentive properties of the measure. The cap has been set at one week (168 hours).

As for the availability measures, caps are placed above the target by an amount equal to one standard deviation from the historical average while collars are placed below the target by an amount equal to two standard deviations from the historical average.

In its original Revenue Proposal, SP AusNet proposed targets for Average Outage Duration measures as described in Table 4.4.4 below. The AER appointed PB to review SP AusNet's proposed targets, and as a result of that review PB recommended a number of changes which were accepted by the AER in its Draft Decision. SP AusNet has carefully considered the AER's amended targets as set out in table 7.9 of the Draft Decision on page 213. SP AusNet has implemented the Draft Decision's proposals in relation to Average Outage Duration Measures.

4.5.5 SP AusNet Proposed Weightings

The AER requires that a minimum of 1 percent of revenue be placed at risk on the measures in the scheme. This is an increase from the current 0.5 percent of revenue at risk during the current regulatory control period.

[15] This relationship was recognised in the Powerlink Draft Decision.

SP AusNet believes weightings or the amount of revenue at risk for each measure should reflect both the reliability of data underlying the measures and the relative importance to customers of each measure. Therefore, the highest weighting has been placed on peak critical availability and the peak non-critical availability weighting has been increased. This is appropriate, since peak outages have the highest potential impact on customers. The weighting of total availability has also been increased as it reflects overall availability performance of the network.

SP AusNet has placed weightings on the loss of supply event frequency index measures for the first time. As explained above, these measures are important, as they are directly related to end customer performance. The proposed weightings are set out in Table 4.4.2 above and are unchanged from SP AusNet's original Revenue Proposal. SP AusNet notes that the AER's Draft Decision accepted the weightings proposed by SP AusNet.

4.5.6 SP AusNet Proposed Specific Exclusions

In addition to existing jurisdiction exclusions on reactors, in its original Revenue Proposal SP AusNet proposed several further exclusions to the scheme that are specific to the Victorian jurisdiction. In SP AusNet's view these exclusions are necessary, due to the specific planned maintenance outages that are large and unusual in nature, and the inclusion of augmentation outages for the first time. For ease of reference, the exclusions originally proposed by SP AusNet are set out below.

Brunswick to Richmond 220 kV Cable Outages	SP AusNet is planning to carry out significant planned maintenance work on its Richmond to Brunswick 220 kV cable over the forthcoming regulatory control period. The asset is underground and has to be excavated for such work to proceed, resulting in substantial outage times. Therefore, years containing such work would have maintenance outages substantially above the historical average.

Large and uncertain VENCorp and Customer Works	These works include: ▪ Fault level mitigation works ▪ Line up-rating ▪ Interconnector upgrades ▪ Switchyard busbar up-rating VENCorp has identified substantial fault level mitigation works in its *Annual Planning Report* in the forthcoming period but has not specified the scope or location of these works as it has not completed a strategy to address this issue. Potential solutions have significantly different outage requirements. Therefore, it proposed that outages associated with any such works are excluded, as it is not possible to make a reasonable estimate of outages for this work. It is also proposed to exclude fault level mitigation works associated with new customer connections for the same reason. Interconnector upgrades or line up-rating where replacement of line conductors is required are generally very large projects with substantial outage requirements. No projects of this nature are specifically forecast by VENCorp for the next regulatory period, therefore, if such projects arise it is proposed to exclude outages for this work. Busbar up-rating works requested by VENCorp may also be significant depending on the relevant station configuration. As there is no definite forecast works, it is proposed to exclude outages for this work.

In its Draft Decision, the AER accepted PB's recommendation that existing shunt reactor and voltage control exclusions be continued into the forthcoming regulatory control period. The AER also agreed with PB's rejection of the proposed third party exclusion.

As there are no line up-ratings, inter-connector upgrade and switchyard busbar upratings forecast for the forthcoming regulatory control period, the AER concurred with PB's view that it would not be appropriate to provide an exclusion for such works. Rather, the AER considered it appropriate that incentives apply to SP AusNet to minimise any such outages.

The AER also did not consider that the Brunswick to Richmond cable exclusion is warranted, and agreed with PB's reasoning for rejecting the exclusion. The AER noted that even if work on the cable cannot be fully completed in the off-peak period, as suggested by PB, and is also undertaken in the intermediate period, the impact on circuit availability parameters is likely to be minimal.

In preparing this revised Revenue Proposal, SP AusNet has considered carefully the AER's conclusions and also PB's review of the proposed exclusions. In response to the matters raised in the Draft Decision, SP AusNet's comments are as follows:

Shunt Reactors

Historically, SP AusNet has been granted an exclusion for Peak and Intermediate hours for Shunt reactor outages. However, the Draft Decision only mentions Peak hours. The deletion of Intermediate period outages may be a simple oversight by the AER, nonetheless, SP AusNet seeks a correction of the definition in the Final Decision.

In particular, it is noted that page 333, Appendix C, Clause C1 of the Draft Decision states:

> "Exclude from 'circuit availability (peak critical)' and 'circuit availability (peak non-critical)' any outages of shunt reactors."

SP AusNet requests that this statement should be amended to read: "Exclude from 'circuit availability Peak and Intermediate critical and non-critical times' any outages of Shunt Reactors".

Brunswick to Richmond Cable

As noted above, PB has recommended and the AER has accepted that SP AusNet's proposed exclusions for planned maintenance work on the Brunswick to Richmond cable be rejected. The recommendations were based on the following reasoning:

- the impact on circuit hours is likely to be immaterial; and
- the STPIS does not allow service performance targets to be adjusted for changes in the amount of maintenance work.

SP AusNet does not believe either of these reasons is correct.

Materiality

Based on the past outages, to replace a joint bay requires an average of 800 hours. A work program of replacement has been formed to replace two joint bays per annum, or an annual outage of 1,600 hours.

Given that the historical average outage hours for Opex is 5,000 per annum, the joint bay replacement work program represents a significant increase (32%) in outage hours required to conduct the Opex works. The effect of these works on the Total Circuit Availability Measure is a shift of 0.09%. This is a significant adjustment and will cost SP AusNet 5.6% of its revenue at risk per annum (over $1 million during the regulatory control period). If the works were needed to be undertaken in the intermediate period the costs to SP AusNet would be greater again.

Compliance with the STIPS Guidelines

PB states in its report that:

> … the STPIS Guideline does not allow incentive targets for circuit availability parameters to be adjusted for changes in the amount of maintenance work. (p. 223)

However, SP AusNet believes that, while targets cannot be adjusted for changes in the amount of opex work, exclusions are not an adjustment to a target but rather an adjustment to actual outcomes. Therefore, the STIPS Guidelines do allow a proposed exclusion to be considered on its merits not subject to any restrictions out lined in Section 2.5 of the Guidelines.

PB goes on to state:

> Nor does the guideline contain specific exclusions for the failure of equipment to reach its technical life. PB considers that it is not unreasonable to expect a TNSP to carry the risk that equipment requires more or less planned maintenance than envisaged at the time of purchase. For this reason, PB recommends that the proposed exclusion criterion not be adopted. (p. 223)

SP AusNet already carries the risk of plant failure across the network, and is happy to continue to do so. This is the case even for outages on what is a unique piece of plant within

SP AusNet's network such as the underground cable. These cables are designed not to require maintenance at all, therefore upon failure can only be accessed through multiple outages lasting months. (In this context, it is noteworthy that an equivalent overhead line could be accessed and repaired in days, if not hours).

The question of the impact on STPIS targets from expected material changes in maintenance programs was considered by the AER in the course of preparing the Draft STIPS Guidelines. At that time, the AER that decided that instead of varying STPIS targets to take into account material variations in maintenance outages it would prefer that such impacts be handled through exclusions.

Both these views were clearly and unambiguously expressed by the AER when considering whether variations to targets for variations in opex be allowed in the Draft STIPS Guidelines.

> The draft Proposed Service Target Performance Incentive Scheme has also been amended to incorporate the comments received from both SP AusNet and ElectraNet. The following paragraphs provide details of specific amendments for each of the respective businesses.
>
> The AER has not included SP AusNet's suggested amendment to adjust targets for changes in maintenance works. The AER considers that the upcoming works on the Richmond-Brunswick line identified by SP AusNet may be best treated as an exclusion. The AER has amended the proposed scheme so that SP AusNet will be permitted to propose particular elements of its specific parameter definitions as part of its revenue proposal (including additional exclusions). During this process SP AusNet would be required to provide full disclosure of the identified maintenance works, appropriate justification of the exclusion of these events and quantification of the expected impact that these works would otherwise have on their service performance outcomes. (AER email to SP AusNet 12 January 2007)

Customer works

PB has also recommended and the AER has accepted that SP AusNet's proposed exclusions for line up-ratings, busbar up-ratings and interconnector upgrades be rejected. The Draft Decision states:

> PB recommends that the AER rejects SP AusNet's proposal to exclude line up-ratings requested by a customer. SP AusNet states that there is a possibility that such works may significantly impact the circuit availability parameter, as there is no such work forecast for the regulatory control period. PB is of the view that SP AusNet should bear the risk that customer-requested works may lead to variations from its forecast.
>
> On the same basis, PB recommends that the AER rejects SP AusNet's proposal to exclude inter-connector upgrades and switchyard busbar up-ratings from the STPIS. SP AusNet proposed that, as there is no work forecast in the regulatory control period, the work category should be excluded. (p. 213, Draft Decision)

In response, it is noted that SP AusNet already bears the risk on the customer's forecasts of known and detailed work. The types of work referred to in the exclusions are either not part of VENCorp's current probability-weighted forecasts or are forecasts made by our customers with insufficient detail to calculate the likely outages required with any confidence. The possible outage outcomes associated with these types of work are highly variable depending on the final work chosen by the customer. This is a matter that is beyond SP AusNet's control, so PB's contention that SP AusNet ought to bear the associated risk has no sound economic basis. The

materiality of the availability impact associated with the projects SP AusNet is seeking to exclude (in the event they occur) is significant.

For example, an interconnector upgrade is forecast in one (out of five) of VENCorp's planning scenarios. Accordingly there is a high degree of uncertainty as to whether the project will proceed on the basis or timing proposed, if it proceeds at all. However, if an interconnector upgrade project did proceed during the current period, the impact on SP AusNet's targets could be significant. For instance, the last Snowy Interconnector upgrade resulted in 3,115 hours of outages. A project of this size would represent an increase of 138% over the forecast customer outage hours included in proposed targets. This is a significant adjustment and would cost SP AusNet 19.8% of its revenue at risk per annum (almost $5 million during the regulatory control period).

The same issues apply to each of the type of works SP AusNet seeks to be excluded. An analysis to substantiate each of the proposed customer works exclusions is attached in Appendix I.

Under these conditions (that is, where a there is a high level of uncertainty as to whether a project will proceed, the timing and scope of the project cannot be forecast accurately or at all, and there would be a large impact on availability of the project does proceed), the use of an exclusion is the most appropriate and efficient approach.

Standard third party exclusion

SP AusNet proposed two clarifications to the standard third party to allow a clear interpretation of the standard third party exclusion during the period. The added words are underlined in the quote below:

> Exclude from 'circuit unavailability' any outages shown to be caused by a fault, outage request or other event on a '3rd party system' e.g. intertrip signal, generator outage, customer installation (TNSP to provide lists).
>
> Any outage requested by a 3rd party for construction or demolition activities on land over which the TNSP has an easement. (p. 14, SP AusNet's "Calculation of the 2008/09 – 2013/14 Service Standards" paper submitted as issue 88 on 24 May 2007)

Third party outage requests

On PB's recommendation the AER has rejected this variation.

Nonetheless, SP AusNet believes it would be useful to outline in the Final Decision the circumstances where adoption of certain exclusions would improve TNSP incentives and efficiency under the service standards regime. In particular, SP AusNet believes all TNSPs should be encouraged to align where possible outages on their own equipment with outages on customer equipment. For example, where a Generator takes plant offline for maintenance a TNSP should be encouraged to complete its own maintenance on assets connected to that plant at the same time so that additional outages that disconnect the generating plant when it is actually available are unnecessary. In these cases, exemptions would actually strengthen the incentives in service standards regime.

In addition, a TNSP should receive an exemption where customer maintenance results in parts of the shared network being taken out of service where only that customer is affected. That is, where a customer has decided to disconnect itself and take out of service SP AusNet assets.

SP AusNet believes that the AER should state in the Final Decision that these circumstances merit an exclusion.

Third party construction and demolition

On PB's recommendation the AER has rejected this variation. PB justified its recommendation on the following basis:

> … that the timing of construction and demolition activities can be influenced by SPA and that the incentive scheme should therefore apply.

SP AusNet does not dispute that the timing can be influenced by SP AusNet (and indeed fully controlled by VENCorp and NEMMCO). However, the relevant issue is that the magnitude of the associated outage is completely outside the control of SP AusNet. For example, If VICRoads needs an outage on a transmission line for construction of a new freeway, SP AusNet may be able to decide when VICRoads can take an outage but it cannot control whether VICRoads needs 5 or 500 hours to complete the construction work. These outages are also extremely infrequent in nature and are not necessarily accounted for in a five year period of historical data. Under these conditions (that is, an unpredictable, rare and potentially large risk), theory would suggest the use of an exclusion is appropriate and efficient.

SP AusNet's revised proposed exclusions from the STPIS, along with its revised proposed targets are set out in the next section.

4.5.7 SP AusNet's revised proposed targets for the STPIS

As noted above, SP AusNet proposes to adopt the Draft Decision in relation to:

- Loss of Supply Index targets;
- Average Outage Duration targets; and
- Weightings.

SP AusNet has not implemented the proposals in the Draft Decision that relate to:

- Availability targets; or
- Exclusions.

On the basis of all of the information presented above, SP AusNet's revised proposed targets for the STPIS, and its revised proposed exclusions from the STPIS are set out below.

Table 4.5.6: Performance incentive scheme – revised proposed targets for the forthcoming regulatory control period

	Collar	Target	Cap	Weight
Availability Measures	**%**	**%**	**%**	**%MAR**
Total Circuit Availability	98.41	98.73	98.89	0.200
Peak Critical Availability	98.61	99.38	99.76	0.200
Peak Non-critical Availability	98.82	99.40	99.68	0.050
Intermediate Critical Availability	97.28	98.66	99.35	0.025
Intermediate Non-critical Availability	97.57	98.73	99.30	0.025
Loss of Supply Event Index		**No.**		
>0.05 min per annum	9	6	3	0.125
>0.3 min per annum	4	1	0	0.125
Average Outage Duration		**Minutes**		
Lines	667	382	98	0.125
Transformers	556	412	268	0.125

Assumes exclusions are approved.

Source: SP AusNet Proposal, PB Report

SP AusNet Proposed Specific Exclusions

For the reasons set out in section 4.5.6 above, SP AusNet is proposing several exclusions to the scheme that are specific to the Victorian jurisdiction. As explained above, these exclusions are necessary, due to the specific planned maintenance outages that are large and unusual in nature, and the inclusion of augmentation outages in availability measures for the first time.

Brunswick to Richmond 220 kV Cable Outages	SP AusNet is planning to carry out significant planned maintenance work on its Richmond to Brunswick 220 kV cable over the forthcoming regulatory control period. The asset is underground and has to be excavated for such work to proceed, resulting in substantial outage times. Therefore, years containing such work would have maintenance outages substantially above the historical average.

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

Large and uncertain VENCorp and Customer Works	These works include: ▪ Fault level mitigation works ▪ Line up-rating ▪ Interconnector upgrades ▪ Switchyard busbar up-rating VENCorp has identified substantial fault level mitigation works in its *Annual Planning Report* in the forthcoming period but has not specified the scope or location of these works as it has not completed a strategy to address this issue. Potential solutions have significantly different outage requirements. Therefore, it proposed that outages associated with any such works are excluded, as it is not possible to make a reasonable estimate of outages for this work. It is also proposed to exclude fault level mitigation works associated with new customer connections for the same reason. Interconnector upgrades or line up-rating where replacement of line conductors is required are generally very large projects with substantial outage requirements. No projects of this nature are specifically forecast by VENCorp for the next regulatory period, therefore, if such projects arise it is proposed to exclude outages for this work. Busbar up-rating works requested by VENCorp may also be significant depending on the relevant station configuration. As there is no definite forecast works, it is proposed to exclude outages for this work.

4.6 VENCorp Availability Incentive Scheme

The original Revenue Proposal explained that the Network Agreement between SP AusNet and VENCorp includes an Availability Incentive Scheme (AIS) that provides for rebates to be paid to VENCorp when network elements are not available for service.

As noted in section 4.1, information supplementing SP AusNet's original Revenue Proposal in relation to this matter has been provided in section 1.5 of Appendix H.

The objectives of the scheme are:

- to encourage SP AusNet to seek plant outages at times when the expected cost to wholesale electricity market participants of an outage is minimal;
- to encourage asset management practices which assist in ensuring that the actual cost borne by market participants due to unavailability of transmission assets is minimised; and
- to encourage asset management practices which assist in ensuring that over the long run, targets for performance are achieved.

This scheme has been in place since 1994 and was expanded at the time of the last revenue determination in 2002 with increased targeting of critical plant and higher rates (revenue at risk).

The AIS assigns an individual rebate rate to each specific item of plant depending on the time of the outage and the criticality of the plant to maintaining supply. Therefore, it provides a more

focused incentive than that provided under the average targets in the AER Scheme and, as such, continues to provide additional benefits to customers over and above those arising under the AER Scheme. The scheme is described in more detail in Appendix B.

The scheme has been very successful; with the incentive encouraging SP AusNet to develop new and sophisticated scheduling techniques that have reduced the level of planned outages in peak periods (refer Figure 4.2.1), greatly improving the security of supply to customers. Prior to the submission of SP AusNet's original Revenue Proposal, the incentive scheme was reviewed jointly with VENCorp, and given its success, both parties agreed to continue the scheme through the forthcoming regulatory period.

In its Draft Decision, the AER stated that it considered that:

- the five year forward capital expenditure program that the scheme was originally based on is no longer valid; and
- the average historical outages the scheme was also based on are now significantly outdated, and do not capture the considerable reduction in outages observed during the current regulatory control period.

On the basis of SP AusNet's historical performance, the AER commented that it is highly unlikely that the expected annual value of the rebates over the forthcoming regulatory control period will be $6.7m ($2007-08) per annum. Rather, the AER considered the average historical annual value of the rebates over the current regulatory control period (for years where actual data is available), being $1.4m ($2007-08), would be a reasonable estimate of the expected value of the rebates over the forthcoming regulatory control period.

4.6.1 SP AusNet's response to the Draft Decision

The AIS was developed and valued in 2001, and the statistical "expected value" of the scheme was determined to be $6 million per annum (in 2002 dollars). The analysis to arrive at the "expected value" was determined by an independent party (Trowbridge), applying outage patterns associated with historical maintenance programs, and planned asset works and capital works programs, plant failure characteristics and the boundary arrangements proposed for the scheme. This was an extremely thorough process. The expected annual value of the current scheme was constructed from the components shown in Table 4.6.1 below.

Table 4.6.1: Components of the expected annual value calculation of the current scheme

Rebate Component	2002$	2007/08$
Total Opex	4,564,305	5,087,810
Planned maintenance	*3,249,507*	*3,622,210*
Unplanned maintenance	*1,283,484*	*1,430,694*
Trip checks	*31,314*	*34,906*
Fault and forced outages	433,057	482,727
SPA Capex	457,957	510,483
Major plant failure	553,759	617,273
	6,009,078	**6,698,291**

Source: SP AusNet

SP AusNet's historic performance during the current regulatory period is shown in Table 4.6.2 below.

Table 4.6.2: Historic rebate payments 2003/04 to 2006/07 (2007/08 $)

Rebate Component	2003/04	2004/05	2005/06	2006/07	Average
Total Opex	491,277	200,235	356,912	1,373,422	605,462
Fault and forced outages	220,679	520,231	294,969	224,093	314,993
SPA Capex	535,549	579,925	1,062,267	1,200,092	844,458
Major plant failure	na	na	na	na	na
Total	**1,247,506**	**1,300,391**	**1,714,147**	**2,797,607**	**1,764,913**

Source: SP AusNet

SP AusNet believes that the allowance proposed by the AER for the next regulatory period significantly understates the expected cost to SP AusNet of the rebate payments it will make to VENCorp under the scheme. SP AusNet therefore believes that the proposed allowance would be inadequate to meet SP AusNet's expected rebate costs. The basis of our view on this matter is set out in the following sections.

Capital works outages

Rebates associated with SP AusNet initiated capex outages have been considerably higher than was forecast for the current scheme (an average actual of $844k versus a forecast of $510k). The historical rebate payments also show a clear relationship between the amount of work undertaken and the associated rebate payments.

Going forward there are two reasons why higher rebates can be expected as a result of the SP AusNet initiated capital work that the company proposes to undertake:

- SP AusNet's Revenue Proposal entails a significant increase in capital work during the next regulatory period as existing, old infrastructure is refurbished or replaced. This increase will lead to a corresponding increase in the level of rebate payments relating to SP AusNet initiated capex, compared to the actual rebate payments made in the current period.
- Additionally, in SP AusNet's future capex program, works are planned at more critical stations in the network, which attract higher rebates when removed from service. This can therefore be expected to result in an increase in the level of rebate payments in the next regulatory period compared to the actual rebate payments shown in Table 4.6.2.

SP AusNet believes that in view of these considerations, the historic average capex outage hours must be adjusted on a similar basis to the STPIS, to reflect the higher capex program in the next regulatory period (which involves an increase in rebateable capex outage hours of 125%). On this basis, the expected capex-related rebate payment calculated by SP AusNet for the purpose of this revised Revenue Proposal has been increased accordingly.

Opex

As stated in section 4.2 above, SP AusNet has made substantial improvements to the scheduling of its planned outages, virtually eliminating planned opex outages from the peak period (resulting in the payment of opex-related rebates averaging $605k per year compared with a forecast of $5.1M per year).

Nonetheless, as noted in Chapter 6 of this revised Revenue Proposal, SP AusNet is forecasting a substantial increase in asset works that will involve considerable outages. It is important to note that, unlike in the STPIS, the AER is not bound by the restriction on adjusting historical data for expected material changes to opex forecasts for the rebate scheme.

SP AusNet believes that the historic average needs to be adjusted to reflect the higher opex asset works program outlined in this revised Revenue Proposal (which involves an increase in

rebateable opex outage hours of 12%). On this basis, the expected opex rebate payment calculated by SP AusNet for the purpose of this revised Revenue Proposal has been increased accordingly.

Forced and Fault outages

Rebates associated with faults and forced outages have been slightly lower than was forecast for the current scheme (an average actual of $315k per year versus a forecast of $483k). This variation is not unexpected over such a short period of time as these outages tend to be largely random in nature.

Therefore, for the purpose of this revised Revenue Proposal, the expected forced and fault rebate has been set using the historical average from 2003/04 to 2006/07.

Major Plant Failure Risk

Negotiation of the terms for the AIS scheme sought to place the majority of unplanned plant outages within the scheme, including many outages of significant scale caused by events that would normally be considered under contract to invoke force majeure. We also acknowledge, however, that a scheme event of force majeure does exist, which represents reasonable limits of exposure. For example, SP AusNet's obligation to pay rebates for the loss of transmission towers caused by storms would only become subject to the force majeure provisions if more than 3 consecutive towers were lost.

The modelling of the AIS scheme includes a probabilistic assessment of outages associated with the major failure modes for the network elements, taking into account the limits of exposure established by the contractual terms. Plant considered in this analysis includes switchgear failure, transmission line tower damage, transformer failure, etc.

During the present regulatory period the Victorian network has fortunately been relatively free from significant externally influenced disturbances to plant availability.

The assessment of plant performance for a specific network in accordance with failure rate probabilities must necessarily be considered over the long term. In 2001, when the allowance rebate payments relating to major plant failure was determined, data sets stretching over 15 to 20 year periods were analysed. The basis of that analysis is still sound. Importantly, there can be no justification in reducing the provision for major plant failure on the basis that its value was not actually neutral in a particular 5 year period.

Therefore, for the purpose of this revised Revenue Proposal, the forecast major plant failure allowance retains the existing allowance value.

4.6.2 SP AusNet's revised Proposal

SP AusNet's revised proposed annual rebate allowance is shown in Table 4.6.3 below. The total allowance for the period is included in the revised opex forecasts set out in Chapter 6.

Table 4.6.3: SP AusNet expected value calculation of the future scheme

Rebate Component	Current AIS 2007/08$	Historic Average	Proposal	Basis
Total Opex	5,087,810	605,462	680,115	Historic Average x 1.12
Fault and forced outages	482,727	314,993	314,993	Historic Average
SPA Capex	510,483	844,458	1,902,055	Historic Average x 2.25
Major plant failure	617,273	na	617,273	Original Analysis
Total	**6,698,291**	**1,764,913**	**3,514,435**	

Source: SP AusNet

SP AusNet has submitted detailed spreadsheets supporting these calculations to the AER separately at the time of lodging this revised Revenue Proposal.

SP AusNet believes this revised proposal leaves SP AusNet with considerable residual risk because:

- the location of work has not been accounted for in this analysis; and
- the scheme is now heavily asymmetric toward the penalty side, the effects of which are yet to be tested.

These issues are discussed below.

Location

SP AusNet has not been able to analyse the revised proposal using an equivalent actuarial review to that completed in 2002 given the brief time allowed to prepare a revised proposal after the issuing of the Draft Decision.

However, as noted above, SP AusNet's capex program for the forthcoming period involves undertaking work at more critical stations in the network, compared to the stations at which work was completed in the current period. Outages at these more critical stations can be expected to result in network elements which attract higher rebates being removed from service.

SP AusNet has not accounted for this effect.

Symmetry

A principle established in the AIS was that the value of the scheme should represent the true statistical expected value of outage rebates. The determination of this value takes into account the probability of particular rebate levels arising, up to the boundary conditions established for the scheme. Under these boundary conditions however, in any one year, SP AusNet is exposed to an aggregate rebate payment obligation of $12m, and to $1.2 million for a single event.

These exposures will be unchanged, even if the allowance made in the revenue cap for rebate payments is reduced.

Reducing the annual provision to the proposed $3.5M exposes SP AusNet to a scheme which is biased downward from the actual expected value. Accordingly, on average SP AusNet would expect to be unable to recover its revenue requirement for the scheme. Under the revised proposal SP AusNet's maximum profit is $3.5M, however, its maximum loss is $9.9M. On the basis of the foregoing analysis, SP AusNet is not confident that the scheme will prove to be neutral over the forthcoming period which was the intention of the framers of the original scheme. Nonetheless, for the purposed of this revised Revenue Proposal, SP AusNet has had no alternative but to accept that risk.

4.7 Mandatory Compliance Obligations

SP AusNet is required to comply with its Licence conditions and National and State Electricity Industry Legislation, Rules and Regulations. In particular, the NER and the National Electricity Market Management Company (NEMMCO) requirements in relation to system protection, communication and metering result in various significant secondary system capex programs (which are defined in Schedule S5 of the NER and operational requirements set by NEMMCO). There are also specific performance obligations regarding the provision of services to VENCorp that are specified in the Network Agreement.

SP AusNet is also required to comply with significant new health and safety, environmental and security obligations in addition to its existing obligations. These obligations and internal standards cover matters such as:

- safe access for work on towers;
- management of fire hazards;
- changes to the Occupational and Safety Act 2004 requiring additional reviews of safety issues at the design stage of a project and additional liability (and therefore cost) for designers;
- management of various pollutants and environmental effects (oil discharge, noise and greenhouse gas emissions);
- vegetation management;
- mitigation of visual intrusion;
- electro-magnetic fields;
- physical security; and
- management of risk associated with unauthorised access to SP AusNet assets.

The key instruments that set out SP AusNet's mandatory compliance obligations are listed in section 5.6 of this revised Revenue Proposal. As noted in Chapter 5 (Capital Expenditure Proposal) and in Chapter 6 (Operating Expenditure Proposal), these obligations have a substantial bearing on the level of forecast expenditure for the forthcoming regulatory control period. Moreover, compliance with these obligations is not a discretionary matter for SP AusNet, so it is important that the revenue cap for the forthcoming regulatory control period contains adequate allowances for all of the capital and operating costs associated with meeting these various obligations.

5 Capital Expenditure Proposal

5.1 Introduction

Clause 6A.6.7 of the NER requires SP AusNet to present its capex requirements for the forthcoming regulatory control period in order to:

- meet the expected demand for prescribed transmission services over that period;
- comply with all applicable regulatory obligations associated with the provision of prescribed transmission services;
- maintain the quality, reliability and security of supply of prescribed transmission services; and
- maintain the reliability, safety and security of the transmission system through the supply of prescribed transmission services.

In addition, Schedule 6A.1.1 describes the type of accompanying information that SP AusNet must provide in order to explain and justify its forecast capex. In light of these requirements, SP AusNet's original Revenue Proposal provided the following information:

- a brief description of the asset management drivers and forecasting methodology employed and the assumptions underpinning the capex forecast;
- an overview of historic and forecast capital expenditure;
- a description of external factors that will affect input cost in the forthcoming regulatory control period;
- a detailed presentation of SP AusNet's forecast capex, for each of the following categories;
  - *system replacement capex;*
  - *compliance-related capex;*
  - *non-system capex; and*
- comments on the deliverability of program.

In its Draft Decision, the AER did not fully accept SP AusNet's capex proposal. In presenting this revised Revenue Proposal, SP AusNet's view is that the above material provided by SP AusNet in its original Revenue Proposal is still highly relevant, particularly in providing helpful background to and support for SP AusNet's revised capital expenditure proposal.

In light of these comments, sections 5.2 to 5.8 below are substantially unchanged from the original Revenue Proposal, apart from appropriate changes to headings and text to make it clear that these sections contain data that relates to the original Revenue Proposal[16]. A new section 5.9 specifically addresses matters raised in the Draft Decision, and includes appropriate cross-references to new supporting appendices. A new section 5.10 concludes with a presentation of SP AusNet's revised capital expenditure proposals in light of the matters raised in the AER's Draft Decision. SP AusNet believes that this approach will assist stakeholders to identify the changes made since SP AusNet's original Revenue Proposal and the reasons for those changes.

[16] In addition, cross-referencing to Appendix G has been added. Appendix G reproduces the supplementary information that the AER requested following the initial lodgement of SP AusNet's original Revenue Proposal. The supplementary information was originally submitted by SP AusNet on 30 April 2007.

As noted in Chapter 2 of this revised Revenue Proposal, all transmission network augmentation in Victoria is planned and contracted by VENCorp or the relevant connected party. Therefore, SP AusNet's capex proposal does not include augmentation capex.

Interested parties should be aware that SP AusNet submitted supplementary information in relation to forecast capital expenditure, and the interaction between capex and opex to the AER on 30 April 2007. The information supplements that contained in SP AusNet's original Revenue Proposal, and was submitted in response to a request issued by the AER pursuant to clause 6A.11.1 of the NER. For ease of reference, this supplementary information is set out in Appendix H. Supplementary information relating to forecast capital expenditure is provided in section 1.3 of Appendix H. Supplementary information regarding the interaction between capex and opex is provided in section 1.7 of Appendix H.

5.2 Asset Management and Capital Expenditure Forecasting Methodology and Assumptions in SP AusNet's original Revenue Proposal

In accordance with Schedule 6A.1.1, this section describes the methodology used for developing the capex forecast presented in SP AusNet's original Revenue Proposal, and the key assumptions that underlie the forecasts. In developing its revised capex programme, SP AusNet has revisited particular aspects of its capex forecast in light of the AER's Draft Decision. Nevertheless, SP AusNet's approach to estimating its required capital expenditure is broadly unchanged from its original Revenue Proposal, and therefore the discussion in this section remains relevant.

SP AusNet's original Revenue Proposal explained that the SP AusNet's capex forecasts are consistent with the implementation and efficient execution of SP AusNet's Asset Management Strategy.

The principal factors underpinning SP AusNet's capex proposal are:

- the key drivers identified in SP AusNet's Asset Management Strategy and cost estimation processes, discussed below;
- the service and compliance outcomes detailed in Chapter 4 of this revised Revenue Proposal;
- the project cost and scoping estimation factors that are expected to influence costs in the forthcoming regulatory control period and beyond, including the impact of external factors that are beyond SP AusNet's control as discussed in Section 5.4.

Chapter 3 of this revised Revenue Proposal explained SP AusNet's approach to asset management in detail. In summary, SP AusNet's Asset Management Strategy delivers the following key outcomes for the Victorian Transmission Network and its customers:

- maintaining reliability levels for customers by creating a stable and sustainable network asset failure risk profile to ensure reliability of supply for customers;
- meeting operational performance targets for network reliability and availability;
- complying with operational Codes and Regulations and with occupational health and safety, environmental and security legislation, codes and regulations; and
- optimising life cycle costs.

To give effect to these objectives, SP AusNet has identified the following drivers of expenditure for the Victorian Transmission Network over the next 20 years.

- Asset Performance and Failure Risk;

- Increasing Network Utilisation;
- Increasing Fault Levels;
- Operational Availability and Reliability Performance;
- Compliance with Legislation, Rules and Regulations; and
- Technological Change.

Many of the drivers flow directly from the aims and outcomes of the Asset Management Strategy (Appendix E), or are challenges and obstacles that must be taken into account to achieve them. SP AusNet's original Revenue Proposal explained that the implementation of the Asset Management Strategy results in the development of detailed projects and work plans which underlie the capex proposal.

All major projects are individually developed, scoped and costed using SP AusNet's cost estimation database, supplier information and escalation rates established from the forecast information discussed in Section 5.4. The scope and costs of capital works are specific to the location of those works; therefore, where difficult working conditions are expected, such as restricted space, this is reflected in the costs, or where substantial temporary works are required to maintain supply, this is reflected in the scope of work. These project specific costs are then tested against internally established 'standard bay' costs as a final check.

In summary, SP AusNet's original Revenue Proposal explained that the company's capex proposal is a prudent and efficient work program that is strongly focused on meeting the company's compliance obligations and the needs of its customers whilst minimising total life cycle costs. In section 5.10, SP AusNet's revised capex forecasts are presented to reflect specific matters raised by the AER in its Draft Decision.

5.3 Overview of Historic and Forecast Capital Expenditure Submitted by SP AusNet in its Original Revenue Proposal

In its original Revenue Proposal, SP AusNet presented its historic and forecast capex as set out in Table 5.3.1 and Figure 5.3.1 below. In summary, this information indicates that total capital expenditure must increase significantly in the forthcoming regulatory control period if SP AusNet is to satisfy its compliance obligations and the needs of its customers.

Table 5.3.1 Total Capex 2008/09 to 2013/14 – by Asset Class (real 2007/08$) submitted by SP AusNet in its original Revenue Proposal

	Average 2003/4 to 2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Total
Secondary	21.7	26.8	20.1	27.5	21.8	14.3	9.9	120.5
Switchgear	22.6	40.9	36.2	49.3	48.5	35.7	70.4	281.0
Transformers	6.0	11.8	12.1	30.7	12.1	37.5	35.6	139.7
Reactive	1.9	7.1	1.2	4.3	10.0	1.4	12.0	36.0
Towers and Conductors	9.3	2.6	4.8	2.9	6.3	7.8	5.2	29.6
Establishment	11.6	20.5	33.3	19.0	29.4	16.0	12.5	130.7
Communications	4.2	7.6	2.3	14.8	13.4	0.0	1.8	39.9
Non System	13.2	11.3	11.8	8.3	9.1	10.6	10.0	61.1
Total	**90.4**	**128.6**	**121.7**	**156.8**	**150.8**	**123.3**	**157.4**	**838.6**

Note: Capex as commissioned (6 months IDC excluded)

Source: SP AusNet

SP AusNet's original Revenue Proposal explained that the proposed capex program continues and builds on the successfully completed capex program for the current regulatory control period. In fact, the company's previous revenue cap application in 2002 clearly indicated the need for increasing levels of capital expenditure in future regulatory control periods[17]:

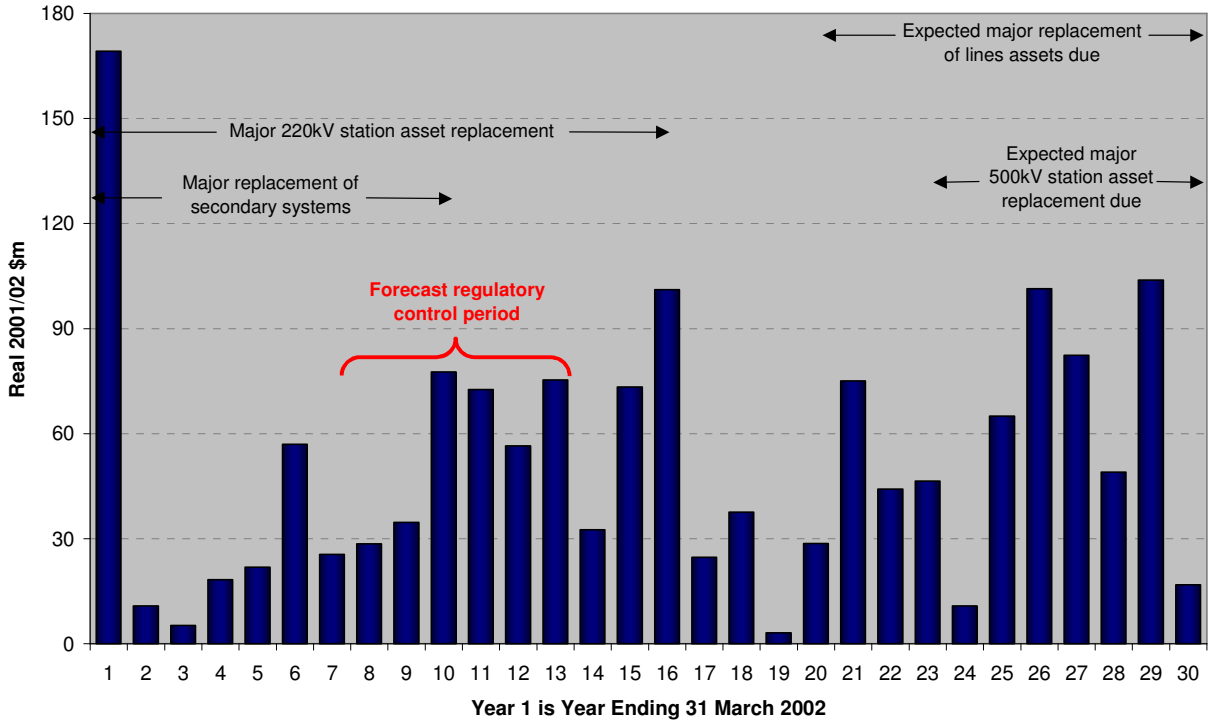
> "SPI PowerNet is at the beginning of a major asset replacement program. For example, the network has reached the stage where significant sections of terminal stations must be replaced. This refurbishment program commenced in 2001 and is expected to continue until 2017."

The 2002 revenue cap application further explained that the company's capital replacement model identified those assets that were at the end of their expected technical lives.

> "The average model forecast expenditure over the 30-year period is $51.6 million per annum and the average over the 2001/02 to 2010/11 period is $44.9 million per annum. By comparison, planned system asset replacement excluding communications, averages $38.4 million per annum (in 2001 dollars) over the period 2003 to 2007/08."

The model outputs (from the 2002 revenue cap application reproduced in Table 5.3.1), combined with equipment condition analysis, defect and incident reports, and performance information, indicated that replacement capital expenditure would need to increase in the forthcoming regulatory control period.

Figure 5.3.1 Major replacement programs driving capex forecasts (from Figure 4.1 in 2002 Application)



Source: SP AusNet

In light of the company's 2002 revenue cap application, the requirement to increase capital expenditure in the forthcoming regulatory control period is not unexpected. SP AusNet's

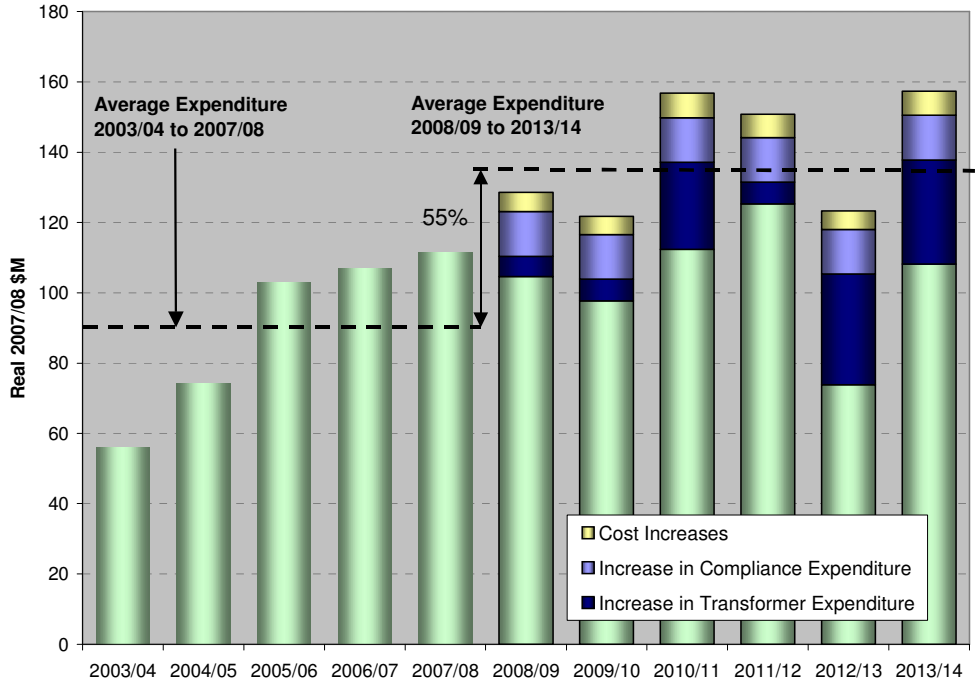
[17] SPI PowerNet's revenue application, for the period 1 January 2003 to 31 March 2008, pages 31 and 33.

original Revenue Proposal explained that the increased volume of capital work planned for the forthcoming regulatory period is driven by:

- the continued roll out of the major terminal station rebuild projects, including more difficult and complex work in confined city sites, where supply must be fully maintained throughout the renewal work, and conversion to expensive, more compact gas-insulated switchgear is required, to allow for expansion of capacity to meet future demand;
- a substantial increase in the number of transformers being replaced over the period, (expected to rise from 12 to 40); and
- further increases in the amount of compliance expenditure required to meet safety, environment and security needs. Consumer, workforce and public expectations in each of these areas continue to reflect higher standards, forcing utilities to provide additional facilities to meet these needs. In most cases, these increased standards are reflected in the mandatory compliance requirements described in Section 5.6.

These factors are unchanged and remain highly relevant for SP AusNet's revised Revenue Proposal. In addition to the anticipated increase in the volume of capital work, a number of external factors relating to input prices will exacerbate the required increase in capital expenditure. These factors are described in more detail in Sections 5.4 and 5.5.

Figure 5.3.2 Non-Augmentation Capex 2003/04 to 2013/14 (Actual and Proposed) (Real 2007/08 $M) as submitted in SP AusNet's original Revenue Proposal*



* Actual to December 2006, forecast to 2013/14.

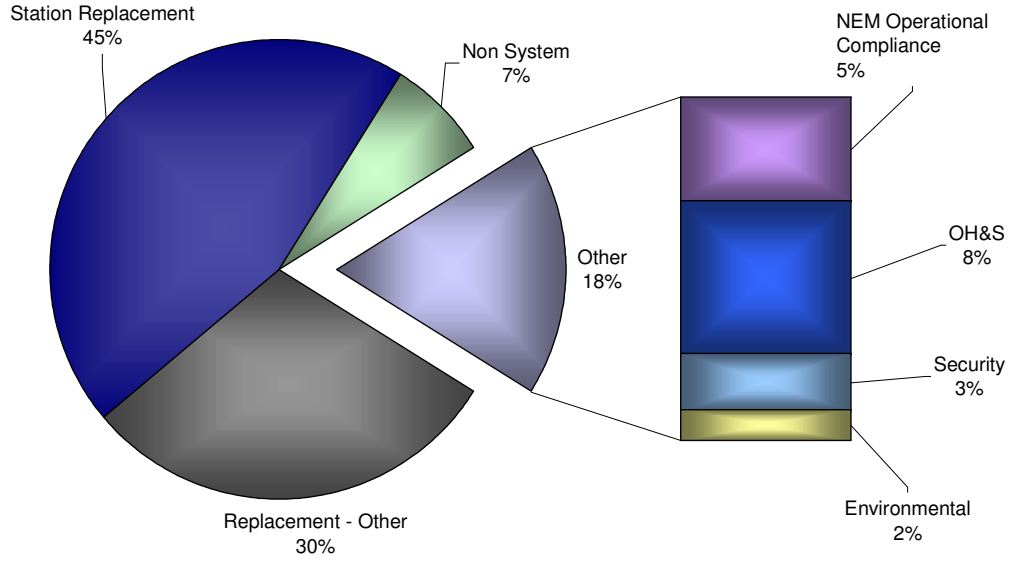
Note: Capex as commissioned (6 months IDC excluded)

Source: SP AusNet

The breakdown of SP AusNet's proposed capex as submitted in its original Revenue Proposal is shown in Figure 5.3.2. The majority of capex (75 percent) is related to replacement of network assets. This is associated either with substantial rebuilding and refurbishment of terminal stations (45 percent), or stand-alone programs addressing specific plant items or fleet problems (30 percent). The remainder of the expenditure is linked to compliance either with operational requirements of the NEM or related to occupational health and safety, environmental or security obligations (18 percent) or non-system IT and business support

programs (7 percent). It should be noted that the exact percentages shown in Figure 5.3.2 will change as a result of SP AusNet's revised capex programme which is summarised in section 5.10. However, the relativities between these different categories of capex will remain broadly the same as indicated in Figure 5.3.2.

Figure 5.3.2 Capex Program by Category of Expenditure as submitted in SP AusNet's original Revenue Proposal



Source: SP AusNet

As noted in section 5.1, information supplementing SP AusNet's original Revenue Proposal in relation to this matter has been provided in section 1.3 of Appendix H.

5.4 External Factors Affecting Input Costs

Since 2005, SP AusNet has been observing increasing cost pressures. This has been particularly noticeable, as the current long-term supply contracts have started to expire. Therefore, for the future period, SP AusNet is forecasting increased costs.

SP AusNet's original Revenue Proposal explained that its capex program is made up of over 600 projects and many of these projects are of a long duration or scheduled to commence some years in the future. Therefore, it is vital that the ex-ante capex allowance approved by the AER allow for the increases in costs already occurring and predicted in the future.

In 2006, SP AusNet commissioned Sinclair Knight Merz (SKM) to examine the factors affecting input costs in the electricity transmission sector to provide an independent check on the internal costs estimates. A copy of SKM's report, *Escalation Factors Affecting Capital Expenditure Forecasts*, was provided as Appendix C in SP AusNet's original Revenue Proposal and is reproduced as Appendix C in this revised Revenue Proposal.

SKM's principal conclusion was:

> "After a prolonged period where costs used for the development of capital expenditure forecasts have increased generally in line with movements in the Australian Consumer Price Index (CPI), market cost pressures particularly over the last three years have grown substantially in excess of CPI."
>
> …

The results of SKM's research indicate that there are a number of factors driving the rapid rises in capital infrastructure costs, namely:

- the increase in world wide commodity prices that has occurred since 2002 / 03;
- subsequent increases in the purchase price of plant, equipment and materials, both locally produced and imported, although these increases are noted to lag increases in commodity prices by a period of 1 to 2 years;
- increases in the cost of local labour and related increases in construction industry costs; and
- general increases in the market price for contracted works in Australia caused by the current demand/supply imbalance and shortages in skilled labour and construction resources." (pp 1-2)

In estimating its future costs, SP AusNet's original Revenue Proposal explained that the company used costs from its 2006 / 07 cost estimation database to construct project specific costs. The 2006 / 07 expenditure reflects the increase in costs observed towards the end of the current regulatory control period, therefore, where 2005 / 06 costs have been used to generate the 2006 / 07 database, they have been escalated at a rate higher than Consumer Price Index (CPI). Different escalation factors were used for different types of assets but were on average 4.7 percent above CPI.

SP AusNet's original Revenue Proposal explained that this is a more conservative assumption than the increase observed in the SKM Report, which estimated that substation switchbay costs exceeded CPI by 5 percent and transformer bay costs exceeded CPI by 6 percent (the majority of work during the forthcoming regulatory period is at substations).

For the forthcoming regulatory control period, these costs are maintained in real terms.

SP AusNet's original Revenue Proposal explained that this is also more conservative than the SKM report, which estimates substation costs will track slightly above CPI over the some period (1 - 2 percent over the period from 2007 to 2013). These observations remain highly relevant to presenting SP AusNet's revised Revenue Proposal in relation to capex forecasts.

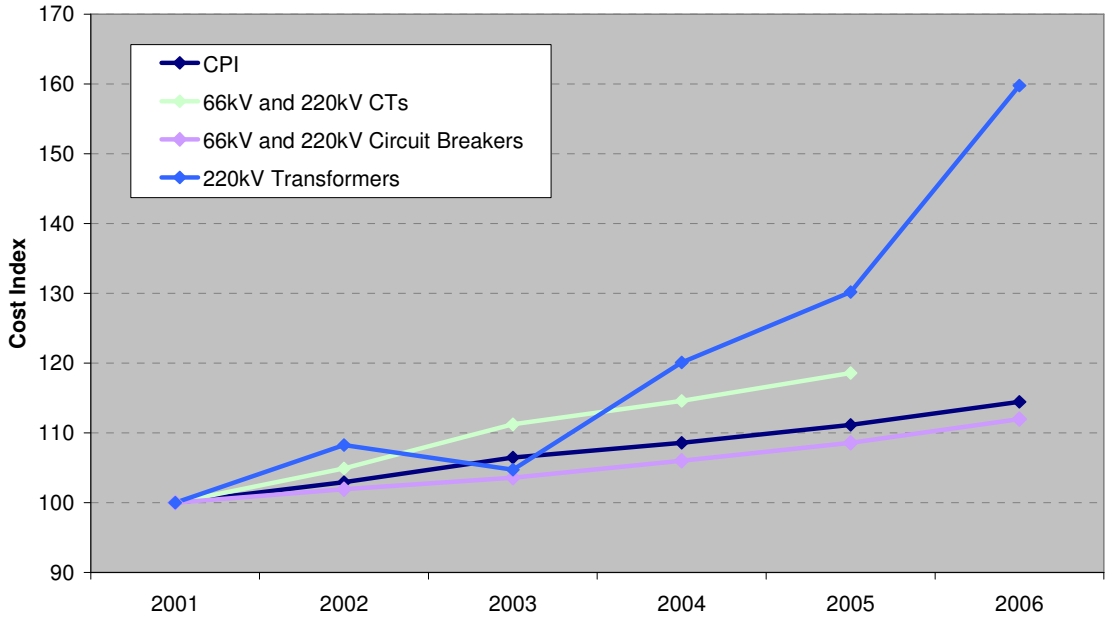
5.4.1 Commodity and Equipment Prices and Labour Costs

SP AusNet's original Revenue Proposal explained that commodity and equipment prices have increased during the current regulatory control period at a much faster rate than CPI. By the end of 2006, copper prices were almost 400 percent above their 2003 levels, while steel and aluminium prices were 150 percent above their 2003 levels. These higher commodity prices flow into equipment costs and construction costs, usually with a 1 - 2 year lag.

SP AusNet manages the risk of changes to input costs by negotiating long-term purchase agreements with suppliers. However, as agreements expire and are replaced by new agreements, SP AusNet is unable to avoid the impact of higher commodity and equipment prices.

Figure 5.4.1 shows SP AusNet's observed increases in contract prices for transformers and switchgear.

Figure 5.4.1 Cost Increases for Key Equipment



Source: SP AusNet

Evidence from the SKM Report also supports this steep rise from 2005, especially for transformers and conductors.

> "Some significant observations that may be made [from SKM's asset valuation and estimating database are]:
>
> - Power transformer costs were relatively stable over the period 2002 to 2004, but began to rise significantly in 2005, increased by 9.29% in 2006 and are expected to rise by more than 10% in 2007;
> - Costs of equipment that are more technology or manufacturing driven rather than commodity price driven (eg. circuit breakers, cable joints / terminations, voltage transformers) tended to be relatively stable during the period;
> - Aluminium cable costs were stagnant between 2002 and 2004 (decreasing slightly in 2003), but have risen 27% over the past two years;
> - Copper cable costs were also consistent between 2002 and 2004 (dropping slightly in 2003), but have increased 50% in the past two years; and
> - AAC and AAAC overhead conductor costs were stagnant between 2002 and 2004 (decreasing slightly in 2003), but have risen by 27% in the past two years, with most of this increase occurring in 2006." (p 14)

SKM calculated the normalised effect of commodity prices (given the share in the final product) on finished asset transmission assets between 2002 and 2006. It was estimated:

- substation bay costs exceeded CPI by 5 percent;
- transformer bay costs exceeded CPI by 6 percent;

- transmission overhead line costs exceeded CPI by 16 percent;
- aluminium cable costs exceeded CPI by 12 percent; and
- copper cable costs exceeded CPI by 24 percent.

SKM noted that these cost trends are expected to continue due to the lag between rises in commodity prices and equipment prices:

> "It is of interest to note from the price trends shown, that there appears to be a significant time lag between the rapid increases in commodity prices (which occurred for copper and aluminium between September / December 2003 and June 2005) and the time at which finished product prices began to rise. …
>
> This suggests that the contract prices for finished product, such as transformers, cables and conductors, will continue to rise well beyond the predicted peaks in commodity prices and likely into 2008. This view has been reinforced anecdotally through discussions with equipment manufacturers and suppliers"

SP AusNet has also experienced labour cost increases, as strong competition for skilled labour has led to unprecedented increases in labour rates in the utility sector. The economic boom in the construction and mining sectors has exacerbated the strong growth in the demand for skilled labour. SP AusNet has assumed that the strong growth in labour costs will continue.

SKM's conclusions on labour rates support this, noting that average weekly income has exceeded CPI by around 2 percent per annum between 2002 and 2006. Using projections from the Commonwealth Treasury, SKM has estimated that the rate of increase is likely to continue over the upcoming period. In particular, it has estimated that between 2006 and 2013:

- general labour will exceed the CPI by 11 percent; and
- site (construction) labour will exceed CPI by 18 percent.

This acceleration in labour rates has also been acknowledged in the recent Access Economics Report[18] commissioned by the AER:

> "… after remaining close to the expected "long-term" rate of 4¼% until 2003 - 04, wage growth in the utilities sector has leapt sharply in the past few years, even as productivity levels have reversed … wages growth in the first few years [from 2005 / 06] is likely to remain relatively strong due to the current skills shortages prevalent in the utilities sector. These shortages are not caused solely by growth in the sector itself, but have flowed from the strength in other sectors - notably construction - in recent years and a similar shortage in the mining sector."

These observations remain relevant to SP AusNet's capex forecasts as presented in section 5.10 of this revised Revenue Proposal.

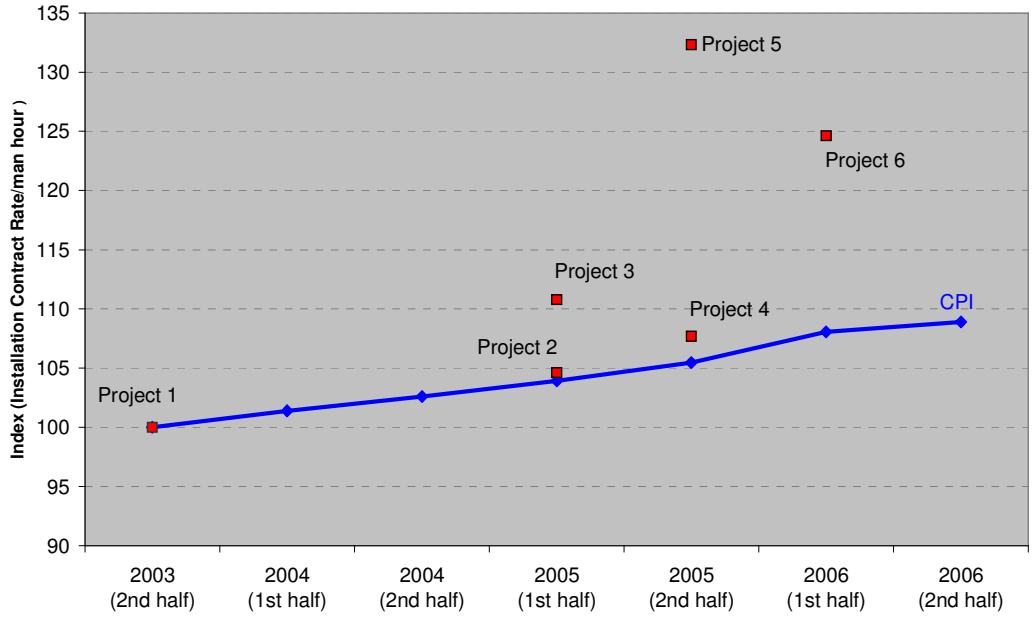
5.4.2 Higher Installation Costs

As a consequence of the rising commodity and equipment prices and labour costs outlined in Section 5.4.1, SP AusNet's original Revenue Proposal noted substantial increases in contractors' installation costs for subcontracted construction work, as installation costs also reflect the increases in commodity prices, equipment costs and higher labour rates. For example, Figure 5.4.2 shows the increase in the contractor rate (expressed in dollars per man

[18] Access Economics Pty Limited, Wage growth forecasts in the utilities sector, November 2006, page i.

hour) between 2003 and 2006 for the construction of major projects. As shown, the rate increased by an average of 21 percent over that period compared with an increase in the CPI of only 11 percent.

Figure 5.4.2: Increases in Contractor Rate for Major Construction Projects



Source: SP AusNet

Again the SKM Study supports these observations:

> "Over the period of time 2002 - 2006, the cost of installed structural steelwork has almost doubled. Applying data from Rawlinson's Australian Construction Cost Handbook, the movement in erected steelwork was in excess of 80%. This number is supported by an increase in Longs Steel index over this same period.
>
> A similar review of Rawlinson's data for concrete foundations, suggests that this component of the bay structure has increased by approximately 24.2% over this period.
>
> Data from the Australian Bureau of Statistics indicates that non-residential construction costs have been increasing more rapidly than CPI. … over the past 8 years the average Australian costs have risen almost 20 percent more than CPI. Victoria's increases have lagged behind the national average over the past year, resulting in increases about 8 percent more than CPI over the 8 year period."

These observations remain relevant to SP AusNet's capex forecasts as presented in section 5.10 of this revised Revenue Proposal.

5.5 System Replacement Capital Expenditure as submitted in SP AusNet's Original Revenue Proposal

5.5.1 Overview of Historic and Forecast Replacement Capital Expenditure

SP AusNet's original Revenue Proposal provided an overview of the total annual historic and forecast capex is set out in Table 5.5.1.

Table 5.5.1 Historic and forecast system replacement capex 2003/04-2013/14 (Real 2007/08 $M) as submitted by SP AusNet in its original Revenue Proposal

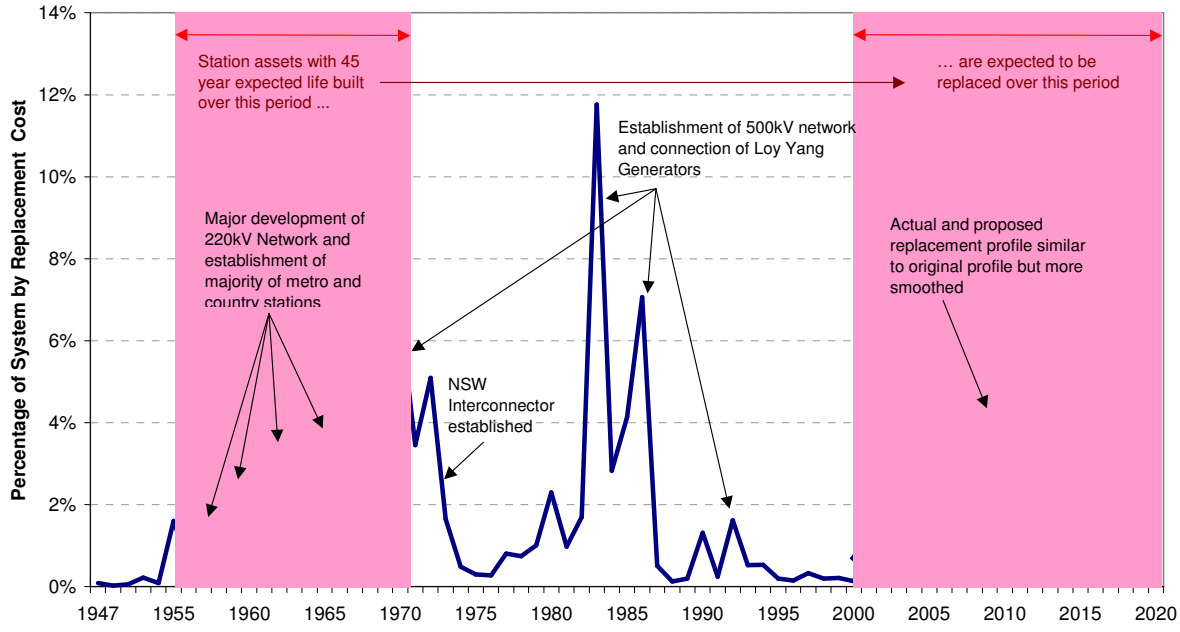
	Average 2003/4 to 2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Replacement - Stations	37.3	39.5	54.5	69.4	51.2	66.6	96.5
Replacement - Other	27.8	47.7	34.1	39.6	55.4	31.8	42.3
Total	**65.1**	**87.1**	**88.6**	**108.9**	**106.6**	**98.5**	**138.7**

Note: Capex as commissioned (6 months IDC excluded)

Source: SP AusNet

SP AusNet's original Revenue Proposal presented Figure 5.5.1 to highlight that the majority of SP AusNet's 220 kV system and associated 22 kV and 66 kV connection assets at terminal stations were built between 1955 and 1970. The primary assets at terminal stations are expected to last 45 years on average, although the range is generally between 40-50 years, depending on the actual condition of the asset. Therefore, SP AusNet's replacement capex plans anticipate the majority of these assets will have to be replaced during the 20 years between 2000 and 2020. These observations remain highly relevant to SP AusNet's capex forecasts as presented in section 5.10 of this revised Revenue Proposal.

Figure 5.5.1 Relationship Between System Development and Replacement as submitted by SP AusNet in its original Revenue Proposal



Source: SP AusNet

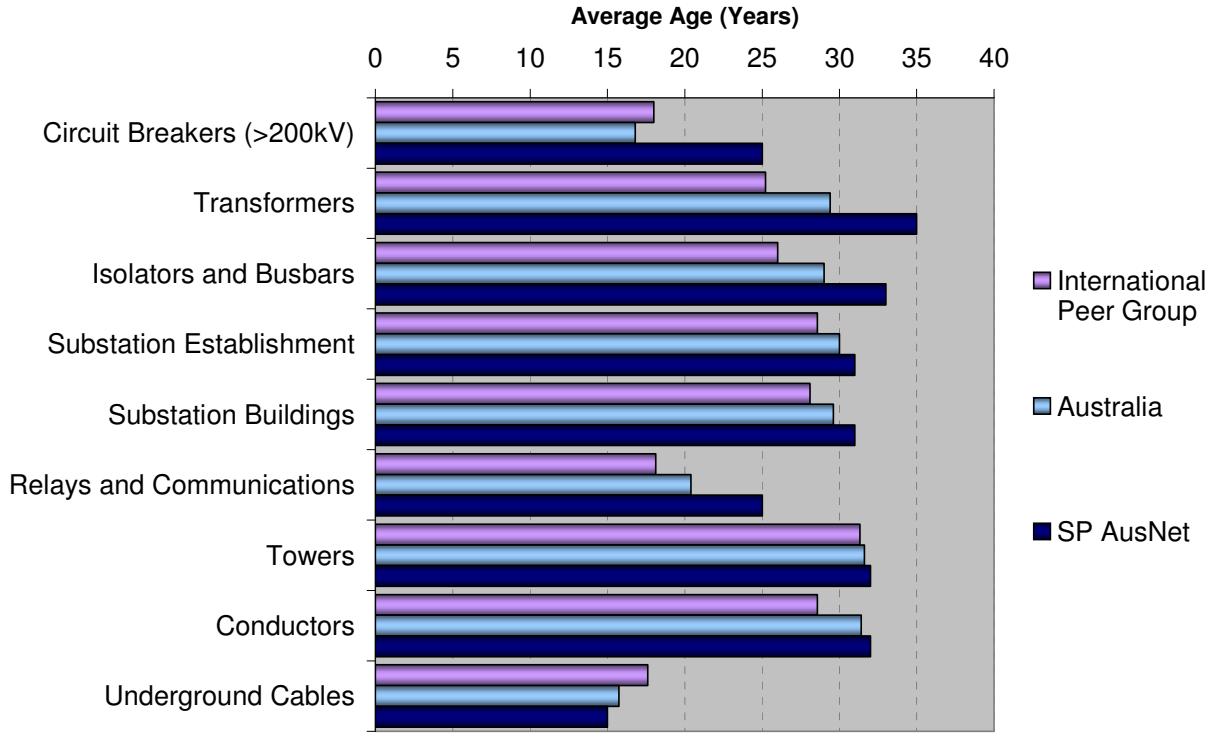
This pattern of historical development of the Victorian transmission network means that SP AusNet has an old network relative to both Australian TNSPs and international transmission networks in other developed nations.

As described in Chapter 3, the International Transmission Operations & Maintenance Study (ITOMS) benchmarking is conducted by a consortium of international transmission companies as a means of comparing performance and practices within the transmission industry worldwide. The most recent ITOMS study allows a comparison to be made between the average age for various equipment types between SP AusNet, Australian TNSPs and the International sample.

SP AusNet's original Revenue Proposal presented Figure 5.5.2 to show that SP AusNet's substation equipment and communications equipment is considerably older than other networks. In particular:

- the average age of SP AusNet's circuit breakers is 8 years above the Australian average and 7 years above the international average;
- the average age of SP AusNet's transformers is 6 years above the Australian average and 10 years above the international average; and
- the average age of SP AusNet's relays and communications equipment is 5 years above the Australian average and 7 years above the international average.
- These facts remain unchanged in this revised Revenue Proposal, and therefore are important factors driving the revised capex forecast presented in section 5.10.

Figure 5.5.2 Average Asset Age, SP AusNet, Australia and International Sample as submitted in SP AusNet's original Revenue Proposal



Source: ITOMS 2005 Report

SP AusNet's original Revenue Proposal explained that replacement capex constitutes the core of the proposed capex program for 2008 / 09 to 2013 / 14. The planned replacement capex program is derived from SP AusNet's Asset Management Strategy (described in Chapter 3) that addresses, amongst other things, asset failure risks on the network associated with the ageing asset base.

Asset and terminal station replacement also provides an opportunity to address some of the other drivers identified in the Asset Management Strategy including:

- fault level mitigation, as newer equipment has higher fault ratings; and
- utilisation, future availability and reliability, as new better designed switching arrangements are possible and small incidental increases in capacity result.

Efficient new technology is also introduced into the asset base via the replacement program, particularly in the secondary and communication areas.

SP AusNet's original Revenue Proposal explained that it is important to recognise that transmission investment is inherently lumpy in nature (as Figure 5.5.1 clearly illustrates) when reviewing actual expenditure in the current period and the forecasts for the upcoming period. While work programs are developed to allow some smoothing of work effort, expenditure will be subject to significant annual variation as major plant items are purchased. This is particularly the case where the overall program is dominated by a small number of large capital-intensive projects, as is the situation in SP AusNet's current station rebuilding and refurbishment program. These observations remain highly relevant to SP AusNet's capex forecasts as presented in section 5.10 of this revised Revenue Proposal.

The remainder of this section describes in more detail:

- the station rebuilding and refurbishment program; and
- Other major replacement programs.

5.5.2 Station Rebuilding and Refurbishment Program as submitted in SP AusNet's Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that the station rebuilding and refurbishment program constitutes 45 percent of total capex forecast for the forthcoming regulatory period. SP AusNet plans major work at the Brooklyn, Glenrowan, Geelong, Hazelwood, Keilor, Richmond, Ringwood, Thomastown and West Melbourne terminal stations during the period from 2008 / 09 to 2013 / 14. All these stations have substantial switchyard assets and/or transformer banks that are expected to reach an unacceptable risk of failure due to deteriorating condition during the period. The sections of the stations to be refurbished or rebuilt are outlined in Table 5.5.2.

Table 5.5.2 Station Refurbishment Program Forecast for 2008/09 to 2013/14 as submitted in SP AusNet's original Revenue Proposal

Station Switchyard to Rebuilt or Refurbished	22kV	66kV	220kV	500kV	Transformers	Expected status at end of period
Brooklyn TS	Y	Y	Y		Y	Complete
Glenrowan TS		Y	Y		Y	Complete
Geelong TS		Y	Y		Y	Complete
Hazelwood TS				Y		Complete
Hazelwood Power station			Y			Complete
Keilor TS		Y	Y	Y		Complete
Richmond TS		Y	Y		Y	In progress
Ringwood TS	Y	Y	Y		Y	Complete
Thomastown TS		Y	Y		Y	Complete
West Melbourne TS	Y	Y	Y		Y	Design/Procurement

Source: SP AusNet

SP AusNet's original Revenue Proposal explained that the majority of terminal stations in the proposed program are metropolitan stations, in contrast to the current period, where the focus was on regional stations. With the risks on the regional network having been largely addressed in the current regulatory control period, the focus of the station rebuild program over next two regulatory periods will be on metropolitan stations. This observation remains highly relevant to SP AusNet's revised Revenue Proposal.

Metropolitan stations generally supply much higher loads in comparison to regional stations, therefore, while the total number of stations in the proposal has reduced from twelve to eight, the number of bays actually being replaced will increase slightly from 42 to 45 bay replacements per annum for the next regulatory period. The number of transformer replacements will increase from 12 to 40 single phase and 3-phase transformers over the next period. The station rebuilds at Brooklyn, Glenrowan, Geelong, Richmond, Ringwood and Thomastown all involve replacement of one or more transformers at the site.

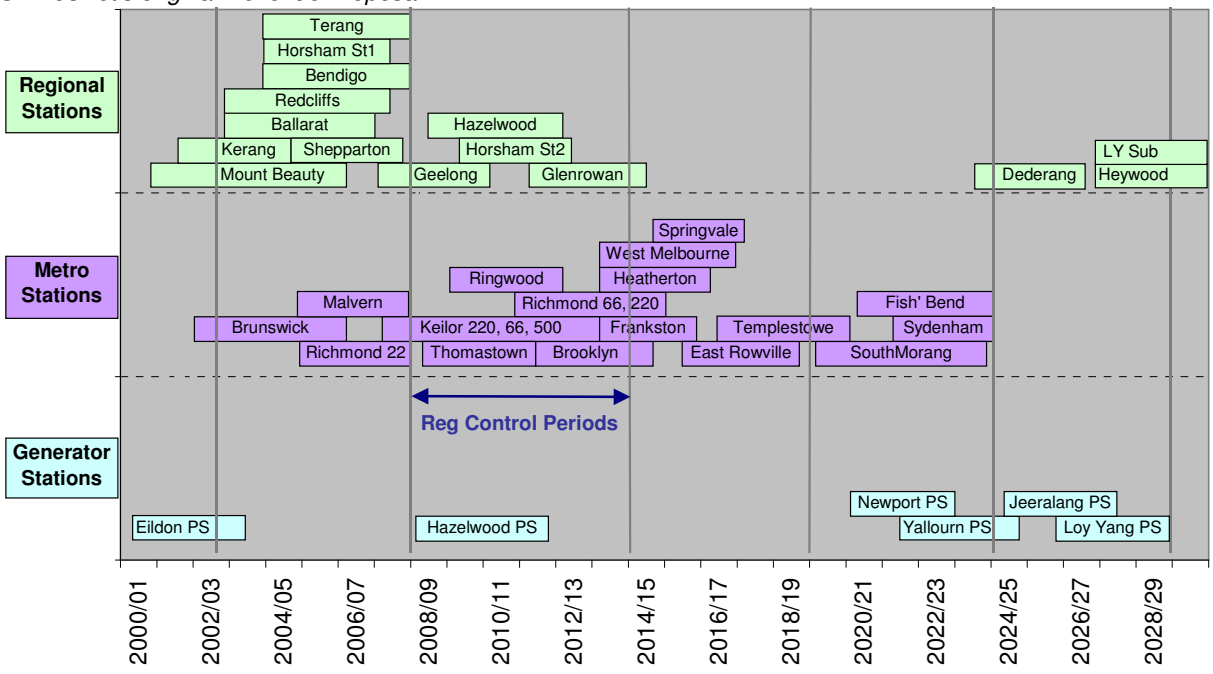
Substantial upgrading and replacement of secondary and communication systems is also included in these station rebuilds to ensure that overall reliability of each station is maintained in accordance with customers' needs and expectations, and to ensure that SP AusNet's network performance targets for the period can be met. Enhanced system capability of modern systems also allows more efficient utilisation of the higher cost primary system assets. Secondary and communications systems provide the core functionality for reliable automatic system operations that enable compliance with NEM operational requirements. Reliability and consistent performance are essential to:

- ensure that fault damage to primary equipment is minimised in the event of a problem on the network; and to
- rapidly isolate faulty equipment in order to maintain system stability.

SP AusNet's original Revenue Proposal presented Figure 5.5.3 to provide a summary of the historic and proposed long-term station rebuilding and refurbishment program to illustrate the long-term nature of planning. The long-term station rebuilding and refurbishment program is updated annually as new information is assessed.

The station rebuild projects for the upcoming regulatory period are discussed in further detail in the following pages. This material replicates the information presented in SP AusNet's original Revenue Proposal as it provides essential background information to stakeholders to understand the proposed capex forecasts in this revised Revenue Proposal.

Table 5.5.3 Historic and forecast station rebuilding and refurbishment program, 2000/01 to 2029/30 as submitted in SP AusNet's original Revenue Proposal



Note: only major rebuilding projects shown, timing is indicative in later periods.

Source: SP AusNet

Brooklyn Terminal Station

Brooklyn Terminal Station (BLTS) supplies the inner western area of Melbourne. This area is primarily industrial including a dedicated supply to the furnace of a steel recycling mill, Melbourne's main sewerage pumping stations, several chemical plants (which have inherently high quality of supply requirements) and the commercial areas on the Western side of the Yarra River. The station has several interconnections at 66 kV with Altona Terminal Station via the distribution system and the combined load includes supply to regional areas such as Bacchus Marsh.

Brooklyn commenced operation as a 220 kV station in 1963 and has been expanded many times to incorporate developments such as the Newport Power Station connection. The development sequence left the terminal station with divided 220 kV switchyards, a large number of very old single-phase transformers (in fact, the oldest on the Victorian transmission network), and an outdoor 22 kV switchyard. The large number of individual plant items means that the site is very heavily utilised and there is little room for expansion. Furthermore, much of the station equipment is near end of life with 220 kV air-blast CBs, 66 kV minimum oil and bulk oil circuit breakers and transformers showing deteriorated condition, lack of manufacturers' support and no availability of spares.

This project covers the redevelopment of BLTS including the 220 kV, 66 kV and 22 kV switchyards, the replacement of all the transformers at the site and associated secondary equipment and control systems.

Glenrowan Terminal Station

Glenrowan Terminal Station (GNTS) supplies the rural area of north-eastern Victoria, including the cities of Wangaratta and Benalla, and provides back up for the single transformer station at Mt Beauty.

Glenrowan Terminal Station was established in the mid 1960s. The 220 kV air-blast circuit breakers, 66 kV minimum oil and bulk oil circuit breakers and transformers are showing deteriorated condition, lack of manufacturers support and availability of spares. A large number of the 220 kV and 66 kV supporting assets are all in the latter part of their technical lives.

This project includes the redevelopment of the Glenrowan Terminal Station 220 kV and 66 kV switchyards and the replacement of one of the single-phase transformer banks at the site as well as associated secondary equipment and control systems.

Geelong Terminal Station

Geelong Terminal Station (GTS) is the main source of supply for over 124,000 customers in Geelong, Corio, North Shore, Drysdale, Waurn Ponds and the Surf Coast. The terminal station consists of a 220 kV and 66 kV switchyard and three 150 MVA 220 / 66 kV transformers.

A large number of the 220 kV and 66 kV assets at GTS have been in service since its establishment in the mid 1960s and all are in the latter part of their technical lives. In particular, air-blast circuit breakers in the 220 kV switchyard and bulk oil and minimum oil circuit breakers in the 66 kV switchyard require urgent replacement. Transformer assessments also indicate that two transformers will require replacement.

The station refurbishment has been divided into two stages to address the more urgent work in the 220 kV yard during the first stage and replacement of the transformers, and the 66 kV circuit breakers in the second phase. This flexibility allows Stage 2 to be co-ordinated with the future East Geelong Terminal Station customer augmentation project planned by VENCorp and Powercor for the Geelong region as this augmentation will require significant outages at GTS as when the new terminal station is cut into the network.

Hazelwood Terminal Station

Hazelwood Terminal Station (HWTS) is one of the most important terminal stations in the Victorian electricity network. Located in the Latrobe Valley, HWTS is one of the main

connection points for generation to the 500 kV transmission network. HWTS effectively comprises two separate switchyards operating at 500 kV, the northern switchyard (developed in the early 1970s as part of the original 500 kV system) and southern switchyard (developed in the early 1980s when the major expansion of the 500 kV system occurred).

In the northern switchyard, the 500 kV airblast circuit breakers and CTs have been in service since the early 1970s. Much of the northern 500 kV switchyard station equipment is near the end of its reliable service life with the air-blast circuit breakers and CTs demonstrating deteriorated condition, lack of manufacturers' support and no availability of spares.

This project covers the refurbishment of HWTS northern 500 kV switchyard including replacement of all 500 kV airblast circuit breakers, and associated CTs, CVTs, secondary and control systems. The station refurbishment will also involve the removal of asbestos.

Hazelwood Power Station

Hazelwood Power Station Switchyard provides the connection point to the transmission network for the associated coal fired power station in the Latrobe Valley. It comprises a 220 kV switchyard.

The station was developed in the early 1960s to allow for the connection of Hazelwood Power Station. Substantial parts of the switchyard were upgraded in the current period as part of VENCorp's augmentation program addressing fault level problems on the network. The remaining 220 kV bulk oil circuit breakers from the 1960s are exhibiting deteriorated condition, lack of manufacturers' support and no availability of spares.

The project comprises a staggered replacement of the 220 kV circuit breakers. The schedule is staggered to align with maintenance outages of the generator units. This work completes the refurbishment of the switchyard.

Keilor Terminal Station

Keilor Terminal Station (KTS) is a very large metropolitan terminal station located in Greater Melbourne's northwest. It was first established in the 1960s, however, it became the first connection point for the 500 kV system for the metropolitan area when the lines were constructed from the Latrobe Valley in 1970. It is comprised of three switchyards operating at 500 kV, 220 kV and 66 kV. It is a major transformation point for the 500 kV system to supply the western 220 kV metropolitan loop including terminal stations located in Geelong, Thomastown, West Melbourne, Brooklyn and Altona. The station also has many 66 kV feeders supplying customers in Airport West, St. Albans, Sunshine, Melton, Woodend, Pascoe Vale, Essendon and Braybrook.

The station's 500 kV airblast circuit breakers and CTs have been in service since 1970. Much of the station equipment is near the end of its reliable service life with the air-blast circuit breakers and CTs demonstrating deteriorated condition, lack of manufacturers' support and no availability of spares. Likewise, much of the 220 kV air-blast circuit breakers, 66 kV minimum oil and bulk oil circuit breakers that have been in service since the 1960s are also exhibiting deteriorated condition, lack of manufacturers' support and no availability of spares.

This project covers the redevelopment of the Keilor Terminal Station (KTS) 500 kV, 220 kV and 66 kV switchyards including replacement of all 500 kV airblast circuit breakers, all CTs, CVTs and associated secondary and control systems and of all 220 kV airblast circuit breakers, and most CTs, CVTs, isolators and associated secondary and control systems.

Richmond Terminal Station

Richmond Terminal Station (RTS) provides the major supply to the Eastern Central Business District and wide-spread inner suburban areas in the east and south-east of Melbourne, including Fitzroy, Collingwood, Abbotsford, Richmond, North Richmond, Hawthorn, Camberwell, Gardiner, Toorak, Armadale, South Yarra, St Kilda, Elwood and Balaclava. The station also

provides supply to City Link and public transport railway substations. The Terminal Station site is on the banks of the Yarra River with no spare land available.

The station's 220 kV supply was established in 1964 and the majority of the 220 kV, 66 kV and 22 kV switchyard equipment was installed at this time. The station's antiquated 220 kV switching arrangement means it is possible to lose 2 lines and 3 transformers from a single CB failure. This is no longer appropriate for modern design, planning and maintenance standards at a station supporting a major city's central business district.

The 220 kV switchyard is situated in a very compact area that would require significant disruption if equipment was required to be replaced in situ. There is very little space for access by cranes or mobile plant, which makes replacement work difficult and increases the outages required for the work. In addition, there is no space to increase the station capacity or to improve the switching configuration with the existing arrangement.

The need to maintain highly reliable supplies for the CBD load during construction places high emphasis on minimising outages and risks associated with relocating plant and equipment. These factors require the replacement of the existing 220 kV switchyard with indoor gas insulated switchgear (GIS) equipment that provides independent switching for all lines and transformers. Replacement of ageing 150 MVA 220 / 66 kV transformers with larger 225 MVA units is also required to create more space to facilitate the refurbishment and provide for further capacity expansion.

The 66 kV switchyard was constructed on landfill using driven piles for equipment and rack foundations. There has been significant subsidence at the station and currently the use of mobile plant is restricted. Much of the equipment is original with the majority of the circuit breakers the bulk oil type. Replacement of some early minimum oil 66kV circuit breakers has already been necessary following some failures.

In addition, the towers that transfer the transformer connections to the 66 kV switchyard no longer satisfy health and safety requirements, and any maintenance work required will require additional outages. These factors require the replacement and relocation of the 66 kV switchyard onto land vacated by the dismantling of the old outdoor 220 kV switchyard. This work will be largely completed in the regulatory control period starting in 2014/15.

Significant replacement of protection, control, metering and communications equipment is also required.

Ringwood Terminal Station

Ringwood Terminal Station (RWTS) is an urban terminal station located in the east of Melbourne. The station's supply area spans from Lilydale and Woori Yallock in the north-east; to Croydon, Bayswater and Boronia in the east; and Box Hill, Nunawading and Ringwood more centrally. It is connected to the 220 kV transmission system by overhead lines from both Rowville Terminal Station and Thomastown Terminal Station. It provides supply to the Ringwood and Mitcham areas via SP AusNet's and Alinta's distribution networks.

Ringwood Terminal Station was established in the mid 1960's and consists of 220 kV, 66 kV and 22 kV switchyards and 220 / 66 kV and 220 / 22 kV transformer banks. Many of its assets are approaching the end of their technical lives with increasing risks in terms of performance, cost and reliability.

The proposed capex program covers the redevelopment of the RWTS 220 kV, 66 kV and 22 kV switchyards and the replacement of all the 220 / 22 kV transformers at the site as well as associated secondary equipment and control systems.

Thomastown Terminal Station

Thomastown Terminal Station (TTS) is one of the earlier stations established in the metropolitan area (first commissioned in 1958) and has gradually expanded with the overall growth of transmission network to be a very large station.

The station supplies the Thomastown area and extends to the rural areas of Kilmore, Eildon and Seymour. The station is also a major point of supply for the eastern 220 kV metropolitan loop including Brunswick, Richmond, Templestowe and Ringwood Terminal Stations, and is the connection point for the NSW interconnector via 330 / 220 kV transformation at South Morang Terminal Station. The station now has ten 220 kV lines connected to the station and five 220 / 66 kV transformers supplying the 66 kV switchyard.

Much of the station equipment is near the end of its life. The 220 kV air-blast and bulk oil circuit breakers and 66 kV minimum oil and bulk oil circuit breakers are indicating deteriorated condition, lack of manufacturers support and availability of spares. In addition, assessments of the transformers indicate that two transformers require replacement.

Fault level limits restrict SP AusNet's ability to take outages at the station; therefore, the redevelopment project will be coordinated with the completion of the South Morang Terminal Station augmentation project. This project will reduce the loading on TTS, facilitating the required construction outages. Nonetheless, substantial temporary work will have to be undertaken to avoid long outages that expose customers to an unacceptable risk of losing supply.

This project includes the redevelopment of the TTS 220 kV and 66 kV switchyards and the replacement of the No 2 and No 3 220 / 66 kV transformers, including various associated secondary equipment and systems.

West Melbourne Terminal Station

West Melbourne Terminal Station (WMTS) supplies the western CBD plus the surrounding residential, commercial and industrial area. It is located on a relatively small site that is almost fully developed. The station is supplied at 220 kV and has both 66 kV and 22 kV supplies to Citipower and AGL. There are four 150 MVA, 220 / 66 kV transformers and two 165 MVA 220 / 22 kV transformers. Much of the existing equipment was installed in 1964. Expansion at the site is difficult due to limited space.

The redevelopment is driven by reliability considerations, load criticality and asset performance particularly as there are limited spares available, several faults have already been experienced and the manufacturer has withdrawn further support for many of the circuit breakers.

The redevelopment of West Melbourne Terminal Station will comprise 4 major stages, namely:

- replacement and conversion of the 220 kV switchyard to indoor GIS switching;
- replacement of the 66 kV switchyard;
- replacement of the 22 kV switchroom; and
- replacement of the 220 / 66 kV and 220 / 22 kV transformers.

The need for redevelopment will commence in the forthcoming regulatory period with the 220 kV switchyard. The last three stages will be completed during the regulatory period commencing in 2014 / 15.

The 220 kV switchyard will be rebuilt as an indoor GIS switchyard, allowing for the connection of four lines and seven transformers with 220 kV cable connections from the switchyard to the transformers. Protection and control systems for the 220 kV switchyard will also be replaced and fire systems and auxiliary supplies upgraded.

Implementation of the replacement program will require the transfer of load to adjacent stations to permit adequate outages for the work. This unavoidable requirement leads to considerable additional costs.

As noted in section 5.1, information supplementing SP AusNet's original Revenue Proposal in relation to the matters discussed above has been provided in section 1.3 of Appendix H.

5.5.3 Other Major Replacement and Operational Compliance Programs as submitted in SP AusNet's Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that these programs cover more specific asset replacement and compliance requirements in locations that do not justify a major station rebuilding and refurbishment program. This may occur for a number of reasons, including:

- to address identified fleet problems,
- to replace assets that predate the majority of the station, perhaps due to small scale initial development;
- to replace assets that deteriorate more quickly than the majority of assets at the station. For example, the very high workload of circuit breakers used to switch capacitor banks substantially shortens their effective technical lives; and
- enable compliance with Technical Standards, which are defined in Schedule S5 of the NER and operational requirements set by NEMMCO.

The replacement and operational compliance projects constituted 30 percent and 5 percent of the total capex program as presented in SP AusNet's original Revenue Proposal. These percentages will change slightly in the revised Revenue Proposal, but the relative proportions will remain broadly the same. The major programs and projects in this category relate to switchbays, transformers, secondary and communications systems, reactive, and towers and lines. Both programs are shown because the operational compliance program is integrated with the secondary and communication replacement program.

Table 5.5.3 provides a summary of the proposed expenditure in relation to each of these programs as set out in SP AusNet's original Revenue Proposal.

Table 5.5.3 Other Replacement Capex Programs 2008/09 to 2013/14 (Real 2007/08 $M) as submitted in SP AusNet's original Revenue Proposal

	Average 2003/4 to 2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Secondary		14.6	13.4	11.2	16.9	9.0	7.0
Switchbays		8.7	10.5	16.1	11.0	11.5	1.6
Transformers		9.9	0.0	1.6	5.6	7.1	12.8
Reactive		6.9	1.2	4.3	10.0	1.4	11.2
Towers and lines		3.3	4.8	2.9	6.3	7.8	4.0
Establishment		4.4	3.7	2.0	4.3	1.6	1.3
Communications		0.2	2.1	14.8	13.4	0.0	1.8
Total	**27.8**	**48.0**	**35.6**	**52.8**	**67.5**	**38.5**	**39.8**
Operational Compliance	1.3	9.0	2.3	21.0	13.4	0.0	0.0

Note: Capex as commissioned (6 months IDC excluded)

Source: SP AusNet

Each replacement program is explained in further detail in the remainder of this section. It replicates the information presented in SP AusNet's original Revenue Proposal as it provides essential background information to stakeholders to understand the proposed capex forecasts in this revised Revenue Proposal.

As noted in section 5.1, information supplementing SP AusNet's original Revenue Proposal in relation to these matters has been provided in section 1.3 of Appendix H.

Switchbays

SP AusNet has a number of terminal stations where there is a variety of circuit breakers, including different types, ages and operating practices or duty cycle. For example, a station switchyard may contain a majority of new breakers installed to address rising fault levels leaving some older air-blast or bulk oil circuit breakers to switch other circuits where the fault duty is not as onerous. Where these remaining breakers present an unacceptable failure risk due to deterioration or rising maintenance cost to keep them in service, a replacement program has been forecast for the forthcoming regulatory control period.

There are also some 500 kV circuit breakers that will not achieve their expected technical life as faults are emerging in the operating mechanisms and high pressure interrupting heads making replacement necessary.

Other items of switchbay equipment such as instrument transformers and surge arrestors also require replacement, in accordance with existing programs aimed at addressing fleet problems. For example, the program covering the removal from service of high voltage oil filled instrument transformers fleets where test results showed serious problems, including an elevated risk of explosive failure (as discussed in chapter 3).

Therefore, these programs largely consist of the replacement or refurbishment of switching equipment, including fleet replacements, outside of the main station replacement program. The main driver of these programs is switching equipment where the forecast asset failure risks on the network or cost of operation are unacceptable usually due to specific fleet problems. The program also targets assets where replacements contribute to VENCorp's fault level mitigation program. Specific projects in this category are:

- replacement of 500 kV circuit breakers at generation connection stations;
- replacement of bulk oil circuit breakers at several stations where other switchyard equipment has already been replaced, either for fault level purposes or they were part of the fleet replacement of air-blast circuit breakers;
- replacement of older 22 kV switchbays where SP AusNet owns the transformer and bus tie circuit breakers, and the feeder switching is owned by distribution businesses;
- replacement of current transformers and voltage transformers; and
- replacement of gap type surge arrestors.

Transformers

Terminal Stations are generally established with one or two transformers of sufficient capacity to meet the initial loading requirements of the station. Transformers are subsequently added to each station in order to meet load growth, until the ultimate capacity of the station is reached. The ultimate capacity is dictated by the constraints of the land area of the station, either to accommodate the number of transformers and associated switchgear, or to allow sufficient space for the number of distribution lines required to provide supply from to the station. Security considerations also dictate that the capacity of stations be limited, so that there is not undue dependence on a supply from single location.

As well as being added progressively, it was also common in the early development of the Victorian transmission network to shift transformers from one station to another. This facilitated more economic development of the system as load increased at each station. For example, a small transformer installed at a station to meet a modest level of initial load could later be transferred to establish another new terminal station, being replaced at the original station with a larger transformer. As a result, it is common for a transformer and its associated switchgear to differ in age from the majority of the other assets at the same terminal station. This practice is not as common now, due to the higher labour costs required to shift existing transformers.

In addition to the station rebuild program which addresses transformers at those stations in the replacement program, this program has been developed to address single transformers and associated equipment that have been identified as requiring replacement. The main driver of this program is the need to ensure asset failure risks on the network are addressed. This program largely consists of the replacement or refurbishment of ageing and deteriorating transformers, bushings and cooling systems.

Specifically, there are two transformers in the regional network where replacement is needed at Dederang and Bendigo Terminal Stations. Two metropolitan transformers are also forecast to need replacement during the forthcoming regulatory period at Heatherton and Ringwood Terminal Stations.

There is a large metropolitan fleet of 150 MVA transformers, purchased in the 1960s that are exhibiting deterioration. Further assessment is required before making specific replacement decisions; however, there will be a continuing transformer replacement program in the future. A number of the transformers in need of replacement will be included in the ongoing main station replacement program.

Secondary and Communications Systems

Secondary systems include protection and control schemes, and associated ancillary equipment that are essential for providing fault and emergency response for the network. As such, these systems provide the core functionality for reliable automatic system operations that enable compliance with Technical Standards, which are defined in Schedule S5 of the NER and operational requirements set by NEMMCO.

Reliability and consistent performance of protection and control schemes are essential to automatically minimise fault damage to primary equipment, in the event of a problem on the network and to rapidly isolate faulty equipment, in order to maintain system stability.

The secondary capex program consists mainly of:

- replacement and expansion of the Supervisory Control and Data Acquisition (SCADA) network to improve control and information flow;
- replacement of EHV protection systems on transformers and lines;
- replacement of HV feeder protection systems;
- replacement of station control and metering systems (unsupported technology);
- development of contingency plans and emergency response equipment; and
- replacement and duplication of AC and DC supplies to stations.

Early generations of protection and control equipment do not have the functionality required to meet new compliance standards and SP AusNet asset management requirements. Ensuring compliance with the NER in the areas of EHV protection operating speeds and redundancy is a specific focus of SP AusNet's protection programs (Schedule S5).

In particular, expenditure is driven by the compliance requirements of:

- Clause S5.1a.8 – fault clearance times;
- Clause S5.1.2.1 – credible contingency events (particularly section (d) relating to protection reliability);
- Clause S5.1.9 – protection systems and fault clearance times (particularly section (d) which mandates a high level of redundancy within the protection and communications areas); and

- the new NEMMCO Data Communications Standard that was introduced during the current reset period (driving a large component of the SCADA/RTU upgrade works programme).

Traditionally, the focus of secondary systems has been on the protection and control of the system to deal with emergency conditions. The advent of new technology has allowed an increasing tendency for the development of specialised control schemes to facilitate specific responses to system conditions, in order to increase the utilisation of the network, and/or to defer the need for more expensive primary plant augmentation.

As secondary systems mainly involve low current electronics, and more recently, digital technology, this equipment has a much shorter life than the primary plant. More frequent replacement is necessary to ensure continuing reliability of this key equipment, and take advantage of the quantum leap that has occurred both in the functionality and reliability of this equipment. This allows the benefits of new technology to be incorporated into the program to ensure that the schemes that are in place provide a modern and up-to-date facility that can provide the most effective utilisation and control of the system.

The communication network provides the links between the protection schemes at terminal stations and carries SCADA to the Operations Centre, equipment monitoring information and independent telephony. The existing network comprises optic fibre, radio, powerline carrier (PLC) and copper supervisory systems all with associated terminal equipment.

The communications network also must comply with the NEM operational standards by providing the required level of high-speed communications redundancy for key transmission line protection schemes. As the network grows, the standards and information flows for asset and network performance increases. This creates a need to expand the capacity of the communications network. At the same time, the existing PLC equipment is no longer supported by manufacturers and the replacement of PLC with optical fibre ground wire (OPGW) is a key strategy to achieve the required increased communications capacity and also overcome the supportability issues.

Therefore, expenditure plans include replacement of some of the PLC equipment that is old and of limited capacity, with OPGW or radio links. SP AusNet also plans to implement serial communications between station devices and replace existing wire control cabling.

All of these proposed expenditures are critical to the maintenance of effective and reliable secondary and communications systems, which in turn are essential to the maintenance of a reliable transmission network. As already noted, in accordance with SP AusNet's Asset Management Strategy, the proposed expenditures are optimised to ensure delivery of the required level of functionality at minimum total life cycle costs.

Reactive Plant

Reactive plant includes capacitor and reactor banks, Static Var Compensators (SVCs), and synchronous compensators. The provision of sufficient reactive plant is critical in allowing the transmission system to support peak demands during summer. Increased air conditioning load is one of the main drivers for the provision of reactive power by the network, since this load consumes high levels of reactive power. VENCorp established a program to install reactive plant over the last 10 to 15 years on a continuing basis to ensure that there is sufficient network capacity to meet the increasing peak summer demands.

Therefore, it is imperative that this plant operates in a highly reliable manner during the peak summer period. Any outages of reactive plant may impact on the ability of the overall system to supply peak summer demand in a secure and reliable manner.

In addition, reactive plant is important to ensure that the overall system may be operated in compliance with the strict voltage limits that are applied by NEMMCO. Any departure from these, as a result of unsatisfactory operation or availability of key items of reactive plant, may

result in voltage control problems with the potential to cause widespread voltage collapse and shut down of the system.

Reactive plant provides a location-specific service and it is difficult to supplement shortfalls from a remote location (i.e. through interconnectors) under extreme system conditions, meaning that all reactive plant items are required to operate reliably at times of system peak demand.

This program largely consists of the replacement or refurbishment of reactive plant and its' associated high-use switchgear. The main determinants of expenditure under this program are the following factors:

- equipment assessed with an asset failure risk in excess of the established critical threshold level will be programmed for replacement, and
- there may be opportunities for new technology to be introduced, to significantly improve operational response, and to improve the reliability of the equipment.

A number of the older 66 kV capacitor banks and reactors are time-switch controlled, and operate on a daily or twice-daily cycle. (In contrast, general switchyard equipment is operated only a few times a year). These capacitor banks are showing deterioration with an increasing number of elements failing, and the associated circuit breakers are deteriorating because of the high number of operations involved.

The three large synchronous condensers continue to provide significant operational challenges, as they are around 50 years old, and have exhibited several problems as they continue to be operated beyond their expected their technical life. These include:

- the rotating equipment incurring significant mechanical wear and deterioration due to constant operation;
- ageing insulation is increasing observable faults within the machines; and
- the 1970's vintage control circuits in which functionality does not match current standards.

One major refurbishment to extend the technical life of one of these synchronous condensers is to be completed in the current regulatory period. Refurbishments of the two remaining units are programmed for the forthcoming period. It must be recognised that synchronous condensers are rotating machines – similar to generators – and require substantial maintenance and replacement to ensure reliable operation into the future.

Static Var Compensators (SVCs) provide a similar dynamic reactive response to the synchronous condensers, although this is achieved by rapid switching and continuous control of static reactive plant. They were installed in the early 1980s. The SVCs have thyristor switching for both capacitive and reactive elements, and these are beginning to fail due to ageing and deterioration. The SVCs' control circuitry is the original equipment and was one of the earliest applications of the then new digital technology control systems in the world. Faults are becoming difficult to remedy in the obsolete circuitry particularly when spares are unavailable. It is now economic to replace the SVC thyristor stacks with new technology devices and the control circuitry for the SVCs is scheduled for replacement with modern digital systems in the forthcoming regulatory period.

Towers and Lines

There are essentially three components of the transmission lines:

- towers;
- conductors; and
- insulators and fittings.

The forecast lines program largely consists of the replacement of insulators and fittings on the conductors. The main drivers of this program are compliance with occupational health and safety standards, the achievement of reliability and availability targets, and the forecast failure risks associated with these assets.

There has been a regular program of insulator and fitting assessment and replacement over the past seven years and this is forecast to continue for another 8 to 10 years. This replacement program ensures reliable performance of the lines by avoiding line faults due to insulator failure and hence the possibility of market constraints.

Dropped conductors also can occur as a result of broken fittings or insulators. This risk has particularly high impact on public safety where lines cross private and public land including major highways and railways. Consequently, expenditure is required for:

- the replacement of line insulators and fittings as determined by their condition and loss of electrical or mechanical strength; and
- the securing of lines at major road crossings and rail crossings to minimise the risk of dropped conductors.

As noted in section 5.1, information supplementing SP AusNet's original Revenue Proposal in relation to this matter has been provided in section 1.3 of Appendix H.

5.6 Compliance-related Capital Expenditure as Submitted in SP AusNet's Original Revenue Proposal

5.6.1 Overview of Historic and Forecast Capital Expenditure

SP AusNet's original Revenue Proposal explained that these programs address compliance with specific legislation, rules or standards. The programs relate to:

- occupational health and safety;
- security measures for critical infrastructure;
- environmental obligations

Table 5.6.1 summarises forecast compliance-related capital expenditure as presented in SP AusNet's original Revenue Proposal.

Table 5.6.1 Non-Replacement Capex Programs 2008/09 to 2013/14 (Real 2007/08 $M) as submitted in SP AusNet's original Revenue Proposal

	Average 2003/4 to 2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
OH&S	4.1	10.3	14.1	12.4	13.6	10.2	5.6
Security	2.8	8.2	3.0	3.2	5.9	2.6	1.5
Environmental	3.9	2.7	1.9	2.9	2.1	1.6	1.6
Total	**10.8**	**21.2**	**19.0**	**18.6**	**21.6**	**14.3**	**8.7**

Note: Capex as commissioned (6 months IDC excluded)

Source: SP AusNet

5.6.2 Occupational Health and Safety as Submitted in SP AusNet's Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that SP AusNet is committed to providing a safe and healthy workplace for employees and contractors. Of course, this commitment remains highly relevant to this revised Revenue Proposal. SP AusNet's Occupational Health and Safety Management System (OHSMS) for transmission assets is certified against the AS/NZ 4801 standard and compliance is checked by regular internal and external audits.

Compliance with the new Victorian *Occupational Health and Safety (Prevention of Falls)* regulations require more rigorous job safety assessments and the increased use of ladders, motion control screens, fall restraint systems, mobile plant, scaffolds, handrails and walkways to ensure the safe performance of work at heights greater than two metres. SP AusNet's original Revenue Proposal explained that SP AusNet has initiated a 15-year *Tower Safe Access* program, which will include an additional $36.5 million (in 2007 / 08 dollars) of expenditure over the forthcoming regulatory period.

Pending recommendations from the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) on electro-magnetic fields (EMF), SP AusNet expects to be required to implement additional control measures to ensure safe working conditions near energised, extra-high voltage electrical equipment. Expenditure for this possible program has not been included in this proposal, however, future expenditure related to such a change will constitute a "service standard event" for the purposes of Clause 6A.7.3 (cost pass through) of the NER.

5.6.3 Security Measures for Critical Infrastructure as Submitted in SP AusNet's Original Revenue Proposal

SP AusNet has more than 100 terminal stations, communication installations, depots and offices that require security. Relevant assets include more than 56 km of security fences, 216 buildings, electronic access controls, intrusion detectors, CCTV cameras, alarm systems and communications to the Network Operations Centre. The state and federal governments have designated selected electricity transmission sites as 'Critical Infrastructure'.

SP AusNet's original Revenue Proposal explained that the security related expenditure programs ensure that SP AusNet complies with the Victorian Terrorism (Community Protection) Act 2003 and results of assessments undertaken under the *National Guidelines for Protecting Critical Infrastructure from Terrorism* and *ENS/ESAA Guidelines for Prevention of Unauthorised Access to Electricity Infrastructure*. Many of these are a continuation of programs commenced in the current regulatory period.

These programs consist of the progressive introduction, improvement and integration of security measures including, fencing, electronic access controls, intrusion detectors, closed circuit television cameras, security lighting, building exterior hardening and remote alarm monitoring by our Network Operations Centre. These observations remain highly relevant to SP AusNet's revised Revenue Proposal.

5.6.4 Environmental Obligations

SP AusNet's original Revenue Proposal explained that SP AusNet is required to upgrade its facilities to comply with various environmental obligations, particularly for the progressive completion of oil spill containment and site water treatment plants at terminal stations. There will also be minor environmental capex works required during the period for noise abatement and land management. These include:

- installation and upgrading of oil containment facilities to comply with EPA Victoria's 'Bunding Guideline Publication 347', AS1940 and standards on water quality discharges;

- noise abatement works to comply with the State Environment Protection Policy (Control of Noise From Commerce, Industry and Trade); and
- visual intrusion works improving the appearance of existing installations and amending the design of new installations to secure community support.

5.7 Non-system Capital Expenditure as Submitted in SP AusNet's Original Revenue Proposal

5.7.1 Overview of Historic and Forecast Capital Expenditure as Submitted in SP AusNet's Original Revenue Proposal

These programs address non-system capex needs in the forthcoming regulatory control period. Non-system capex includes:

- business information technology (IT); and
- other business support investment such as the fit out of premises, and the purchase of tools and vehicles.

Table 5.7.1 summarises historic and forecast non-system capital expenditure as presented in SP AusNet's original Revenue Proposal.

Table 5.7.1 Non-System Capex Programs 2008/09 to 2013/14 (real 2007/08 $M) as Submitted in SP AusNet's Original Revenue Proposal

	Average 2003/4 to 2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Business IT	7.3	8.9	9.5	6.0	6.8	8.2	7.6
Support the Business	5.8	2.4	2.4	2.4	2.4	2.4	2.4
Total	**13.2**	**11.3**	**11.8**	**8.3**	**9.1**	**10.6**	**10.0**

Note: Capex as commissioned (6 months IDC excluded)

Source: SP AusNet

5.7.2 Business Information Technology as Submitted in SP AusNet's Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that outside of the major SCADA upgrade, which is included as part of the secondary systems program, IT expenditure for the forthcoming regulatory period is forecast to be $47 million (in 2007 / 08 dollars). This includes many automation projects and programs in the areas of Network Management and Asset Management. The provision of appropriate IT infrastructure necessary to support and maintain a technically demanding IT environment comes at a significant cost. Furthermore, the essential replacement of desktop and laptop hardware, together with up-to-date servers and systems to host the ever-increasing software demands, is a necessary investment in this industry.

5.7.3 Support the Business as Submitted in SP AusNet's Original Revenue Proposal

SP AusNet's original Revenue Proposal included the following information in relation to Support the Business capital expenditure. This information remains relevant to SP AusNet's revised Revenue Proposal and the capex forecasts presented in section 5.10.

Inventory movement
This covers the expected increase to inventory holdings each year. The increase is consistent with historical levels.

Premises
This program involves the refurbishment of SP AusNet's non-system buildings. Expenditure is below historical levels as the fit out of the consolidated head office was completed during the current regulatory period.

Motor Vehicles and Mobile Plant
This program involves the replacement of the vehicle fleet and specialised mobile equipment to allow safe access to terminal station plant and lines for maintenance and construction. Expenditure is consistent with historical levels.

Other Tools, Equipment and Miscellaneous Assets
This program involves the replacement of tools and equipment required to maintain the network. Expenditure is consistent with historical levels.

5.8 Program Deliverability as Submitted in SP AusNet's Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that the replacement capex program for the forthcoming regulatory period represents a material increase in expenditure from the level undertaken in the current period. As such, it is important to demonstrate that such an increase is achievable.

Therefore, the increased program must be assessed against of the total capex managed by SP AusNet in Victoria. For example, in 2006 / 07, SP AusNet is forecasting to spend $400 million across its gas and electricity networks. Thus, the real increase of 53 percent for non-augmentation capex represents just a 30 percent increase in total transmission capex (including augmentation) and 12 percent of total SP AusNet capex.

SP AusNet has demonstrated during the current period it can successfully manage an increase in capex of this order. The average capex during 2003 / 04 to 2007 / 08 was substantially higher in real terms than the period from 1998 to 2002. SP AusNet's experience in efficiently executing its previous capital expenditure program is reflected in its Project Delivery Model, which is described below. The information relating to project delivery presented in this revised Revenue Proposal replicates that provided in SP AusNet's original Revenue Proposal as it remains highly relevant.

5.8.1 Program Delivery Model

Program Optimisation

Work arising from SP AusNet's expenditure plans is bundled into projects to ensure that the delivery of this work is cost effective and minimises outages. This optimisation takes into account forecast works across the major categories of primary, secondary and communications equipment.

Design

The provision of design services has been restructured, by tendering standard work packages and selecting a number of service providers based on price, quality and performance. This process results in more efficient specification and delivery of design services at lower costs and within reduced timeframes.

Purchasing

A strategic purchasing group has been established to deliver efficiencies in purchasing due to the volume of works and the price pressures in the market. This is a critical initiative to minimise cost increases and includes forming long-term supplier contracts, where benefits accrue to both parties in the form of more stable pricing. SP AusNet also benefits from the lower pricing offered for increased order volumes.

Installation

Installation services are tendered out on a competitive basis to the installation service provider panel and internal benchmarks are established to provide an indication of fair market rates.

Both capex and maintenance services are provided by internal and external service providers. The decision to use external service providers has been optimised based on the strategic importance of the work and the most efficient delivery model for the services. External work is sourced by competitive tendering.

For internal and external service providers, benchmark measures are established to monitor costs and performance.

5.9 SP AusNet's Response to the Matters Raised in the AER's Draft Decision

5.9.1 Introduction and overview

Sections 5.2 to 5.8 of this revised Revenue Proposal have substantially replicated the information presented in SP AusNet's original Revenue Proposal. As noted earlier, this approach has been adopted because SP AusNet believes that much of the information presented in the original Revenue Proposal is relevant as it assists stakeholders in understanding the basis of the revised Revenue Proposal made by SP AusNet in response to the AER's Draft Decision.

In preparing its Draft Decision, the AER engaged PB Strategic Consulting (PB) to undertake a review of SP AusNet's proposed forecast capex allowance to assess whether it is in accordance with the requirements of clause 6A.6.7 of the NER. PB undertook a detailed review of a sample six network projects and one non-network project proposed by SP AusNet for inclusion in its forecast capex allowance. The projects reviewed by PB comprise approximately 28% of SP AusNet's capex forecast[19].

In addition to the review undertaken by PB, the AER also undertook a separate review of:

- other projects forming part of SP AusNet's targeted replacement programs; and
- a selection of station rebuild / refurbishment projects.

Based on these reviews, the Draft Decision concluded that the adjustments set out below (Table 4.26 of the Draft Decision) should be made to SP AusNet's capex forecast.

[19] The projects reviewed by PB were: Refurbishment of HWPS; Redevelopment of RTS; Transformer replacement; Replacement of station and control centre SCADA; Response capability for undefined works; Replacements of post-type CTs; and Vehicles.

Table 4.26: AER's conclusions – Total adjustments to SP AusNet's forecast capex allowance ($m, 2007-08)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
SP AusNet's Proposal	**128.02**	**147.70**	**140.14**	**140.85**	**139.69**	**158.87**	**855.26**
PB's recommended adjustments	-10.63	-15.23	-6.37	-21.87	-36.31	-32.55	-122.96
AER's adjustments							
Refurbishment of HWPS	-0.28	-1.41	-1.08	-1.08	-1.08	-1.08	-6.03
Redevelopment of RTS	0.00	0.00	0.00	-8.24	-25.54	-21.04	-54.81
Transformer replacements	-3.50	-5.40	2.50	-3.60	-7.90	-4.50	-22.40
Replacement of SCADA systems	-1.30	-1.30	-1.40	-1.40	-1.40	-1.40	-8.20
Response capability undefined works	-0.92	-0.92	-0.92	-0.92	-0.92	-0.90	-5.50
Replacement of CTs	-2.00	-3.60	-2.80	-1.37	-0.42	1.10	-9.09
Vehicle replacements	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57	-3.42
Inventory	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.24
Replacement of 500 kV CBs	-3.50	1.40	0.00	0.00	0.00	0.00	-2.10
Replacement of 66kV switch-bays	-1.27	-2.06	-0.14	-0.02	0.00	0.00	-3.49
Redevelopment of BLTS	0.00	0.00	-1.48	-9.22	-2.69	0.00	-13.40
Refurbishment of TTS	-3.48	-11.05	2.06	-2.48	0.00	0.00	-14.95
Redevelopment of RWTS	-0.24	-0.46	-0.16	-0.44	0.12	-0.42	-1.60
Refurbishment of GNTS	0.00	0.00	0.00	0.00	-3.21	-3.21	-6.42
Refurbishment of KTS	-2.42	-4.49	0.00	-0.86	-0.86	0.00	-8.62
Refurbishment of GTS	-3.02	-0.83	-4.04	0.00	0.00	0.00	-7.89
Refurbishment of HWTS	-0.23	-0.23	-0.23	-0.23	-0.23	-0.23	-1.39
Labour and materials escalations	-0.31	-0.05	-0.44	-1.00	-1.99	-2.91	-6.70
AER's total adjustment	**-23.07**	**-31.02**	**-8.74**	**-31.46**	**-46.72**	**-35.20**	**-176.23**
AER's conclusion	**104.95**	**116.68**	**131.40**	**109.39**	**92.97**	**123.67**	**679.04**

Source: Draft Decision

The remainder of this section responds in detail to the matters raised in the Draft Decision (as listed in Table 4.26 of the Draft Decision) by re-examining each relevant aspect of SP AusNet's originally proposed capex forecast. Before turning to a detailed examination of these matters, it is noted that page 103 of the Draft Decision states:

> "Although the adjustments in table 4.26 are for the most part set out on a project specific basis, the AER notes that the total capex after all of these adjustments is an allowance only. The AER's project-specific conclusions should not be taken to bind SP AusNet to a particular set of project-specific capex budgets – SP AusNet has the ultimate discretion in how it allocates its capex allowance."

SP AusNet concurs that under the ex ante capex framework, decisions regarding the allocation and expenditure of the capex allowance are indeed matters over which the company retains discretion.

In this context, SP AusNet also notes that pursuant to clause 6A.6.7(c) of the NER, the AER must accept SP AusNet's forecast of required capital expenditure provided that the AER is satisfied that the total of the forecast capital expenditure for the regulatory control period reasonably reflects, among other things:

- the efficient costs of achieving the capital expenditure objectives set out in clause 6A.6.7(a) of the NER; and
- the costs that a prudent operator in the circumstances of the relevant Transmission Network Service Provider would require to achieve the capital expenditure objectives.

For the reasons set out in further detail below, SP AusNet considers that the total capex allowance proposed by the Draft Decision is insufficient to compensate the company for the costs that it reasonably expects to incur in achieving the capital expenditure objectives in a prudent and efficient manner.

In particular, the Draft Decision's proposed exclusion of SP AusNet's entire proposed contingency allowance as well as its proposed allowance for undefined works would severely impede the company's ability to undertake efficiently and prudently all the capital works required to achieve the capital expenditure objectives set out in the NER.

Given the importance of these two matters, the remainder of this section is structured as follows:

- section 5.9.2 (immediately below) re-examines the contingency allowance;
- section 5.9.3 re-examines the proposed allowance for response capability for undefined works; and
- section 5.9.4 presents SP AusNet's response to the Draft Decision's proposed adjustments to labour and materials escalation.

SP AusNet then presents its responses on each of the remaining matters, in the order in which they are listed in Table 4.26 of the Draft Decision, as follows:

- section 5.9.5 re-examines the refurbishment of Hazelwood Power Station Switchyard;
- section 5.9.6 re-examines the redevelopment of the Richmond Terminal Station;
- section 5.9.7 re-examines the transformer replacement program;
- section 5.9.8 re-examines the replacement of station and control centre SCADA;
- section 5.9.9 re-examines the CT replacement program;
- section 5.9.10 re-examines the vehicle replacement program;
- section 5.9.11 re-examines the capex allowance for inventory;
- section 5.9.12 re-examines the replacement of 500 kV Circuit Breakers;
- section 5.9.13 re-examines the replacement of 66 kV Circuit Breakers;
- section 5.9.14 re-examines the redevelopment of Brooklyn Terminal Station;
- section 5.9.15 re-examines the refurbishment of Thomastown Terminal Station;
- section 5.9.16 re-examines the refurbishment of Ringwood Terminal Station;
- section 5.9.17 re-examines the refurbishment of Glenrowan Terminal Station;
- section 5.9.18 re-examines the refurbishment of Keilor Terminal Station;
- section 5.9.19 re-examines the refurbishment of Geelong Terminal Station; and
- section 5.9.20 re-examines the refurbishment of Hazelwood Terminal Station.

In the course of re-examining the matters listed above, SP AusNet has produced a series of detailed supporting papers to substantiate its response to the Draft Decision and its revised proposed capex forecast. Copies of the supporting papers have been provided to the AER under separate cover. Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal. Whilst these documents have been provided to the AER under separate cover, they form part of this revised Revenue Proposal.

In presenting the new information set out in this section (and the supporting papers and appendices), SP AusNet has had particular regard to the AER's Draft Decision and the NER requirements in respect of capex forecasts. Appropriate cross-referencing to the Draft Decision and the NER is provided throughout the remainder of this section.

5.9.2 SP AusNet's cost accumulation process – Contingency allowance

Overview of the Draft Decision

SP AusNet's cost estimates for its station rebuild/refurbishment projects included a contingency allowance. SP AusNet had explained to the AER that[20]:

- The contingency allowed for the station refurbishments is to cover costs that arise when this type of complex refurbishment work is undertaken.
- The cost estimate for a station refurbishment project only covers the scope of work that can be defined at the estimation stage. Naturally issues will arise as the detailed design and installation work is undertaken.

SP AusNet's proposed contingency allowance totalled $24.8 million over the regulatory period.

PB recommended removing SP AusNet's proposed contingency allowance on the basis that:

- SP AusNet's base unit costs (without the inclusion of a contingency allowance) represent efficient costs when benchmarked against PB's cost database.
- The generalised 'brownfield' factor and the labour and materials escalations may act to double count on some of the unknowns to which the proposed contingency relates.
- The application of a contingency reduces the incentive for SP AusNet to forecast costs accurately and implement projects efficiently.
- The risk is effectively transferred to customers, who pay for the allowance regardless of whether the cost included for contingencies is realised.

The AER accepted PB's recommendation, noting (on page 95 of the Draft Decision) that:

> "SP AusNet has included a number of other risk mitigation allowances in its forecast capex proposal. These include the 'brownfield factor' in all cost estimates involving work at a brownfield site, a suite of 'response capability' projects catered to unforeseen events, and real labour and materials cost escalations. The combined effect of these allowances and the proposed contingency allowance for station rebuild / refurbishment projects potentially double-counts the risks intended to be captured by the proposed contingency allowance, and overestimates the costs likely to be incurred."

The AER also commented that SP AusNet had not presented any strong evidence justifying the need or quantum of its proposed contingency allowances for each individual station rebuild project.

[20] Ibid, page 94.

SP AusNet's response to the Draft Decision

It is noteworthy that the AER did not comment specifically on PB's view that:

- The application of a contingency reduces the incentive for SP AusNet to forecast costs accurately and implement projects efficiently.
- The risk is effectively transferred to customers, who pay for the allowance regardless of whether the cost included for contingencies is realised.

SP AusNet's view is that both of these observations from PB are open to challenge. In particular:

- The NER sets out the objective criteria that SP AusNet's capital expenditure forecasts must satisfy. The relevant issue, therefore, is whether the proposed contingency allowance satisfies the requirements of the NER. It is not appropriate for PB or the AER to create "incentives" to forecast accurately by disallowing the contingency allowances if this allowance is justified in accordance with the NER.
- SP AusNet does not agree that the issue of "risk transfer" to customers is a relevant consideration. The allowance is intended to provide SP AusNet with a reasonable overall allowance for capital expenditure. The nature of a reasonable overall allowance is that risk of cost overruns is shared fairly between SP AusNet and customers. Disallowing the contingency allowance would not result in a fair-sharing of risk because SP AusNet would very likely have insufficient funds to complete the proposed capital expenditure programme.

Although SP AusNet rejects these two issues raised by PB, SP AusNet acknowledges the concerns expressed by PB and the AER that the contingency allowance could 'double count' risks already identified. SP AusNet's view, however, is that the contingency allowance is justified by the complex nature of the station refurbishment projects. In complex projects of this kind, it is not possible to foresee all elements of the scope of work required to complete the project. Unless a contingency is allowed to cover these unforeseen elements, the cost allowance will be insufficient to complete the project.

In response to the AER's comment that SP AusNet had not presented any strong evidence justifying the need or quantum of its proposed contingency allowances, SP AusNet engaged Evans and Peck to undertake further analysis. The scope of Evans and Peck's assignment was to analyse the cost impact of the risks associated with SP AusNet's capital works program for the 6 year regulatory period from 1 July 2008 to 30 June 2014, and to develop a risk adjusted estimate of the capital works program. Evans & Peck has undertaken similar reviews for Powerlink and ElectraNet as part of their Regulatory Reset submissions to the AER. Evans and Peck's key conclusions are as follows:

> "Based on discussions with SP Ausnet, it is Evans & Peck's view that SP Ausnet has improved its estimating processes, and that the differential between out turn costs and estimates has narrowed and will continue to narrow over time.
>
> A rigorous and detailed risk assessment and modelling exercise has calculated an increase in the outturn cost of SP AusNet's capital works project portfolio between 7% - 9% above the non-risk adjusted "reference" estimate. This is lower than industry experience would typically suggest, and shows that SP Ausnet has been conservative (ie. optimistic) in estimating the amount of risk that is contained in its portfolio of projects. By being conservative in estimating the amount of risk in its portfolio, SP Ausnet has produced a conservative (low) cost of delivering it's portfolio of projects.
>
> In relation to the Station Rebuild projects the reference estimate provides the starting point from which this risk model has been developed. Based on our experience there is no way the program of Station Rebuild's can be delivered for the cost identified in the reference estimate ($337m). There is only a

10% chance that the costs will not exceed $363m, 50% chance of being delivered for less than $367m and 80% chance of being delivered for less than $371m.

Evans & Peck would recommend that at this stage of the project procurement cycle that a P80 figure would be appropriate."

The Evans and Peck report is titled Risk Review of Capital Replacement Program, October 2007. A copy of the report has been provided to the AER under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal. These documents have been provided to the AER under separate cover.)

On the basis of the conclusions set out in the Evans and Peck report, SP AusNet considers that proposed contingency allowance set out in its original Revenue Proposal is fully justified, and satisfies the requirements of the Rules. In particular, SP AusNet considers that the information presented in SP AusNet's original Revenue Proposal, supplemented with the detailed analysis set out in the supporting report by Evans and Peck demonstrates that SP AusNet's proposed contingency allowance reasonably reflects:

- the efficient costs of achieving the capital expenditure objectives set out in clause 6A.6.7(a) of the NER; and
- the costs that a prudent operator in the circumstances of SP AusNet would require to achieve the capital expenditure objectives.

On this basis, SP AusNet considers that the AER must, pursuant to clause 6A6.7(c) accept the inclusion of the revised proposed contingency allowance in the capital expenditure forecast.

Table 5.9.1 below sets out the revised proposed contingency allowance, based on the information presented in SP AusNet's original Revenue Proposal, supplemented with the detailed analysis set out in the supporting report by Evans and Peck.

Table 5.9.1: Revised proposed contingency allowance ($m, 2007-08)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
SP AusNet's original proposal	3.54	4.24	3.57	3.76	5.51	4.19	24.81
AER Draft Decision allowance	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SP AusNet's revised proposal	3.54	4.24	3.57	3.76	5.51	4.19	24.81

Source: SP AusNet

5.9.3 Response capability for undefined works

Overview of the Draft Decision

PB recommended removing the entire $5.5 million proposed allowance for 'Response capability for undefined works' projects on the basis that SP AusNet already has sufficient discretion within its overall replacement capex program to ensure minor unforeseen risks can be addressed. The AER stated that it agreed with this assessment, and considered that SP AusNet had not demonstrated that a capex allowance of undefined scope reasonably reflects the expenditure of a prudent and efficient TNSP required to meet the capex objectives in clause 6A.6.7(a) of the NER.

The AER considered that SP AusNet's estimation processes are accurate down to a fine level of detail, and that its asset management practices are flexible enough to address risks in a systematic and efficient way. On this basis the AER removed this allowance, resulting in a downward adjustment to SP AusNet's forecast capex allowance of $5.5 million.

SP AusNet's response to the Draft Decision

SP AusNet has achieved substantial improvements in its estimating systems and processes, as acknowledged by the AER. These improvements are complemented by a parallel process of asset condition monitoring and forecasting that enables long term modelling of asset replacement requirements and risk.

Over the current regulatory period SP AusNet's prudent asset management processes led to the identification of the need for in excess of $45 million worth of unforeseen capital works. SP AusNet's delivery of these unforeseen works was acknowledged on page 286 of the Draft Decision. Inclusion of these works into SP AusNet's risk modelling (and the planned works program) is possible if sufficient data are available regarding probability of failure and consequences of outcomes.

Whilst SP AusNet's risk modelling has delivered a transparent and fully justified program of prioritised works, there remains a residual amount of 'unscoped' work that SP AusNet believes, through engineering experience, will be encountered during the next regulatory period. This work will have to be undertaken and will not be included in the risk modelling. The reason for exclusion of these works is that they will have been unforeseen and/or there is currently insufficient data available to provide reliable and transparent risk modelling.

At this point in the development of SP AusNet's risk modelling, inclusion of contingency for unforseen works would have resulted in reduced confidence by external stakeholders in the modelling and the perception that there may be potential for inefficient investment in the network. Accordingly, SP AusNet has successfully reduced its provision for unforeseen works by 87% for the 2008-2014 regulatory period from the $45 million prudently expended on these works during the current period to a reasonable and prudent forward-looking amount of $5.5 million. SP AusNet's estimate of the $5.5 million allowance has been derived through a review of completed 'unforeseen' works by experienced engineering staff in order to determine the types of work that should be included in the risk modelling, and the types of work likely to be encountered as future unforeseen works.

As noted in section 5.9.2 above, SP AusNet engaged the services of Evans & Peck[21] to undertake risk based modelling, using the $45 million of unforseen works completed, to determine the appropriate quantum for future unforseen works. The result of their risk and probability modelling has indicated an amount of $14.5 million as appropriate. The $5.5 million allowance sought by SP AusNet in this revised Revenue Proposal is, therefore, a relatively conservative provision for unforeseen works but is an amount that SP AusNet, based upon its engineering judgement, is prepared to accept as reasonable and prudent.

Given that SP AusNet has provided a bottom up, detailed, costed and prioritised works program to deliver the appropriate service standards, exclusion or deferment of planned projects to accommodate unforeseen works will compromise the efficiency and effectiveness of the service delivery program. To ensure efficient and effective delivery of an agreed planned works program, it is normal industry practice to make provision for unforeseen works that SP AusNet, PB and AER are aware of, and have recognised will be incurred. Exclusion of this provision can only result in the delivery of a sub-optimal program of planned works.

SP AusNet considers that the information set out above, and in the accompanying supporting paper by Evans and Peck demonstrates that SP AusNet's proposed allowance for the cost of minor works reasonably reflects:

- the efficient costs of achieving the capital expenditure objectives set out in clause 6A.6.7(a) of the NER; and

[21] Evans & Peck, *Risk Review of Capital Replacement Program*, October 2007. A copy of the report has been provided to the AER under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal. These documents have been provided to the AER under separate cover.)

- the costs that a prudent operator in the circumstances of SP AusNet would require to achieve the capital expenditure objectives.

On this basis, SP AusNet considers that the AER must, pursuant to clause 6A.6.7(c) accept the inclusion of the allowance for minor works costs in the capital expenditure forecast, in lieu of the proposed 'response capability for undefined works' allowance which the Draft Decision rejects.

Table 5.9.2 below sets out the proposed minor works allowance.

Table 5.9.2: Revised proposed allowance for the cost of minor works ($m, 2007-08)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
SP AusNet's original proposal	0.92	0.92	0.92	0.92	0.92	0.92	5.50
AER Draft Decision allowance	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SP AusNet's proposal	0.92	0.92	0.92	0.92	0.92	0.92	5.50

Source: SP AusNet

5.9.4 SP AusNet's cost accumulation process - Labour and materials escalation

Overview of the Draft Decision

The Draft Decision noted that:

- SP AusNet proposes to apply a real escalation to its base capex estimates to account for real increases in labour and materials prices expected over the forthcoming regulatory control period.
- 2005-06 costs have been used to generate SP AusNet's $2006-07 cost estimation database, so it had applied a once-off real escalation (of around 4.7% averaged across its asset base) to reflect the labour and materials cost increases observed towards the end of the current regulatory control period.
- SP AusNet proposes to maintain capex costs at this level in real terms throughout the forthcoming regulatory control period.

The effect of applying SP AusNet's proposed real escalations to its capex is to increase its proposed forecast capex allowance by a total of $35.7m over the forthcoming regulatory control period.

The Draft Decision stated that the AER considers that:

- SP AusNet's proposed real cost escalations for its 'Switchgear', 'Reactive' and 'Transformers' asset classes appear to have been over-estimated and therefore do not reasonably reflect a realistic expectation of prudent and efficient capex costs.
- SP AusNet's proposed real cost escalations for its 'Secondary', 'Communications' and 'Establishment' asset classes appear to have been under-estimated and therefore an upwards adjustment has been made for capex associated with these asset classes.
- SP AusNet's proposed real cost escalations for its 'Lines' asset class compare reasonably well and therefore reasonably reflect a realistic expectation of prudent and efficient capex costs.

On the basis of the detailed analysis contained in Appendix B.3 of the Draft Decision (summarised above), the AER stated it was not satisfied that a net amount of $6.7 million of SP AusNet's proposed real capex cost escalations reasonably reflects a realistic expectation of the cost inputs required to meet the capex objectives. The AER made corresponding downward

adjustments (totalling $6.7 million) to SP AusNet's proposed real capex cost escalations for each of its network asset classes.

SP AusNet's response to the Draft Decision

For the purpose of this revised Revenue Proposal, SP AusNet has accepted the AER's proposal regarding labour and materials escalation.

5.9.5 Refurbishment of Hazelwood Power Station Switchyard (HWPS)

Overview of the Draft Decision

In relation to the proposed HWPS refurbishment, PB considered that SP AusNet had demonstrated a clear need to replace 24 bulk-oil 220kV circuit breakers (CBs) at this station. In the Draft Decision, the AER stated that it agreed with PB's assessment, given that the 24 CBs have been assessed as being in relatively poor condition in SP AusNet's CB risk model. The AER accepted PB's recommendations that the technical scope and cost of the bulk-oil CB replacements appeared efficient and prudent taking into account the incremental costs of replacing the old CBs with units of modern equivalence. Further, the AER accepted PB's technical advice that a number of items identified by SP AusNet for replacement at HWPS are not required to meet the primary identified need to mitigate the risk of CB failure.

On this basis, the AER considered that SP AusNet had not demonstrated that the inclusion of these items reasonably reflects prudent and efficient capex required to meet the capex objectives in clause 6A.6.7 of the NER. To reflect this assessment, the AER made a downward adjustment to the SP AusNet's capex allowance for the HWPS refurbishment of $4.0 million relative to SP AusNet's (updated) proposed capex allowance for HWPS of $35.7 million.

SP AusNet's response to the Draft Decision

SP AusNet has prepared a detailed supporting paper titled HWPS JW420 CB Replacement – Ancillary Equipment: 2008-2014 capital works: Response to Draft Decision, to provide the information PB acknowledged was possibly available, but not readily evident, to support the reasons for replacement of the plant and equipment at HWPS that was excluded by PB in its review of the project. A copy of the supporting paper has been provided to the AER under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal. These documents have been provided to the AER under separate cover.)

The supporting paper provides the justification for inclusion of the following items in SP AusNet's revised capex proposal:

- control building costs;
- replacement of pin and cap insulators;
- replacement of the line-side disconnectors;
- replacement of associated CTs and CVTs; and
- surge arrestors.

SP AusNet's original capex proposal contained an allowance of $693,000 for the costs of constructing a building to house protection and control equipment at HWPS. PB's estimate of the building costs appears to be based on previous estimates for smaller buildings which are not suitable for HWPS. PB has not been able to provide evidence that their estimate of $360,000 is a reasonable estimate of the cost of a control building at HWPS. On the other hand, SP AusNet's original capex proposal contained an estimate of the efficient cost of provide

a suitable building to house protection and control equipment at HWPS, consistent with the costs that would be incurred by a prudent operator in SP AusNet's circumstances (in accordance with the capex criteria set out in clause 6A.6.7(c) of the NER.

Pin and cap insulators at HWPS are in excess of 40 years of age and have a history of failures due to cracking caused by moisture ingress in the jointing compound. Economic studies reveal that replacement of these assets in conjunction with other works remains the least cost solution (in present value terms) compared with deferred replacement for up to 35 years. Service lives of 75 to 80 years are clearly impractical for insulators of this design.

Thirty manually operated disconnector switches are involved in the HWPS refurbishment project. These assets have service lives of 30 to 40 years and account for 30% of defects (seized motion and poor electrical connections) in the Victorian electricity transmission fleet due to the high aerial pollution levels associated with the nearby open cut coal mine. Dismantling and reassembling line-side disconnectors is necessary to affect the CB replacements. Economic studies reveal that replacement in conjunction with CBs remains the least cost solution (in present value terms) compared with deferred replacement for up to 25 years. Service lives of 60 to 65 years are impractical for these disconnectors.

There are no CT replacements involved with the replacement of the JW420 circuit breakers; however there are 30 capacitive voltage transformers involved in the HWPS refurbishment project. These assets have service lives of 20 to 40 years and are in the latter part of their service life as short circuits are developing in the capacitor packets leading to inaccurate voltage measurements and hence inaccurate protection operations. In cases of significant insulating oil loss, immediate replacement is necessary to avoid an explosive failure. Economic studies reveal that replacement in conjunction with CBs remains the least cost solution (in present value terms) compared with deferred replacement for up to 20 years.

Surge diverters provide improved lightning protection for equipment and lines personnel compared with the existing rod gap diverters. Replacement of assets that use redundant technologies (rod gaps) with modern surge arrestors in conjunction with other asset replacements is prudent and economically justified.

The complexity of the rebuild program, restrictions in obtaining network outages and safety of personnel in respect of clearance requirements are key drivers in determination of the construction schedule and plan that requires the dismantling of the assets in question. These factors combined with consideration of the respective asset age/condition and the need to ensure compliance with required standards, justify the incremental cost of the overall program (which is the cost of materials for the dismantled line side isolators and associated equipment).

On this basis SP AusNet's revised capex proposal reinstates the $4.3 M worth of works on the HWPS refurbishment project that was excluded by the Draft Decision, and reinstates a further $1.7M for project contingency. Substantiation of the project contingency has been set out in a separate supporting paper (the Evans and Peck report titled Risk Review of Capital Replacement Program) which has been provided to the AER under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal.)

SP AusNet considers that the information set out above and in the supporting papers demonstrates that SP AusNet's revised proposed allowance for the cost of HWPS refurbishment works reasonably reflects:

- the efficient costs of achieving the capital expenditure objectives set out in clause 6A.6.7(a) of the NER; and
- the costs that a prudent operator in the circumstances of SP AusNet would require to achieve the capital expenditure objectives.

On this basis, SP AusNet considers that the AER must, pursuant to clause 6A.6.7(c) accept the inclusion of the revised allowance for the cost of HWPS refurbishment in the capital expenditure forecast.

Table 5.9.3 below sets out the revised proposed allowance for the cost of HWPS refurbishment.

Table 5.9.3: Revised proposed allowance for HWPS refurbishment ($m, 2007-08)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
SP AusNet's original proposal	8.20	4.10	8.80	3.50	5.80	6.20	36.60
SP AusNet's updated original proposal	4.90	11.70	8.60	3.40	5.60	1.50	35.70
AER Draft Decision allowance	4.90	10.90	7.80	2.60	4.80	0.70	31.70
SP AusNet's revised proposal	**4.90**	**11.70**	**8.60**	**3.40**	**5.60**	**1.50**	**35.70**

Source: SP AusNet

5.9.6 Redevelopment of the Richmond Terminal Station (RTS)

Overview of the Draft Decision

The AER accepted PB's recommendations to remove the costs for replacement of three transformers and the redevelopment of the 66 kV switchyard at RTS from SP AusNet's proposed forecast capex allowance. The AER considered that SP AusNet had not demonstrated that these elements reasonably reflect prudent and efficient expenditure required to meet the capex objectives (set out in clause 6A.6.7(a) of the NER) over the forthcoming regulatory control period.

Further, the AER accepted PB's technical advice that the incremental cost of SP AusNet's proposed reconfiguration of the 220 kV switchyard into a twelve CB arrangement at RTS does not justify the marginal improvement in reliability. Overall, the AER accepted PB's recommendations with respect to the RTS redevelopment, and made a downward adjustment to SP AusNet's proposed forecast capex allowance of $51.7 million to reflect this assessment.

SP AusNet's response to the Draft Decision

SP AusNet has prepared further detailed information to substantiate its proposed redevelopment of Richmond Terminal Station during the forthcoming regulatory control period. The information is set out in a supporting paper titled *Richmond Terminal Station Redevelopment 2008-2014, Capital Works – Revised Revenue Proposal*. A copy of the supporting paper has been provided to the AER under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal. These documents have been provided to the AER under separate cover.)

SP AusNet's agrees with some of the aspects of the AER's Draft Decision, as summarised in Section 1.2 of the supporting paper, and apart from refining the cost estimates has not prepared further evidence for the justification of the following works:

- The 220 kV redevelopment is justified based on asset failure risk, the insecure switching arrangement, high operating and maintenance cost and importance of the load supplied from Richmond Terminal Station.
- The incremental cost of a 220 kV indoor GIS development is justified on the basis that it enables cost-effective future augmentation of the terminal station and improves the security of the 220 kV switching.

However, further evidence is submitted to support SP AusNet's proposal for an integrated project, which includes the 220 kV, 66 kV and 22 kV switchyards as well as the replacement of the 220/66 kV transformers. The main reasons for the proposed works are:

- There is a higher total cost ($ 113.6 M vs. $103 M) and a higher NPV cost ($74.7 M vs. $71.9 M) for the deferment of the 66 kV switchyard redevelopment and 220/66 kV transformer replacement (Deferred Replacement Option) compared with the integrated station redevelopment option.
- There are higher asset failure risks (66 kV switchgear and 220/66 kV transformers) and increased operating and maintenance costs if the proposed works do not proceed.
- The proposed works entail the timely replacement of assets which have reached the end of their service life and which present failure risks in excess of customer's value of electricity supply reliability.
- GHD's assessment of the structural failure risk of the piles supporting a significant part of the 66 kV switchyard (as described in Richmond Terminal Station 66 kV Switch Yard Investigations – Preliminary Report[22]) places some urgency on the redevelopment of the 66 kV switchyard.
- The proposed works provide an economically efficient means of resolving the site civil issue by vacating the areas subject to subsidence and structural failure risk instead of investing in short term solutions to retain the assets in service in the effected areas. It is also questionable whether the remedial works proposed in the Draft Decision would address the underlying problem and mitigate the identified risks.
- The proposed works entail a program of work that would provide for the lowest risk of supply interruptions during the construction phase of the project.
- The proposed works would implement an economically efficient long term solution rather than managing asset failure and civil risks, which would require increased operating and maintenance and remedial works expenditure, and higher risks to supply reliability.
- The scope of the proposed works reflects SP AusNet's soundly-based view that a 220 kV breaker-and-half switching configuration provides a more secure switching arrangement for the CBD load supplied from Richmond Terminal Station and provides for simple future augmentation of this strategic installation.

The downward adjustments of $4M, $20.6M and $23M ($47.6M in total) proposed by the AER would not enable SP AusNet's to undertake the outstanding work with the remaining funding.

The Deferred Replacement Option would cost $113.55 M with $62.29 M required for the 2008–2014 regulatory period and $51.26 M for the 2014–2020 regulatory period.

SP AusNet considers that the information summarised above and set out in the in supporting papers demonstrates that SP AusNet's revised proposed allowance for the cost of the RTS redevelopment project reasonably reflects:

- the efficient costs of achieving the capital expenditure objectives set out in clause 6A.6.7(a) of the NER; and

[22] A copy of this supporting paper has been provided to the AER under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal. These documents have been provided to the AER under separate cover.)

- the costs that a prudent operator in the circumstances of SP AusNet would require to achieve the capital expenditure objectives.

In particular, in regard to the capital expenditure objectives set out in the NER, the level of expenditure recommended by the Draft Decision in relation to RTS refurbishment is, in SP AusNet's view:

- insufficient to enable SP AusNet to maintain the reliability and security of supply of prescribed transmission services (clause 6A.6.7(a)(3)); and
- insufficient to enable SP AusNet to maintain the reliability, safety and security of the transmission system (clause 6A.6.7(a)(4)).

On this basis, SP AusNet considers that the AER must, pursuant to clause 6A.6.7(c) accept the inclusion of the revised allowance for the cost of the RTS redevelopment project in the capital expenditure forecast.

It is further noted that SP AusNet proposes that the 66 kV switchyard redevelopment should be defined as a Contingent Project should the AER's final decision be to not provide an allowance for this work.

Table 5.9.4 below sets out the revised proposed allowance for the cost of the RTS redevelopment project.

Table 5.9.4: Revised proposed allowance for the RTS redevelopment project ($m, 2007-08)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
SP AusNet's original proposal	0.00	0.00	0.00	7.20	44.80	37.7	89.70
AER Draft Decision allowance	0.00	0.00	0.00	0.00	30.30	17.70	38.00
SP AusNet's revised proposal	**9.50**	**7.00**	**0.00**	**2.80**	**51.90**	**31.60**	**103.00**

Source: SP AusNet

5.9.7 Transformer replacement program

Overview of the Draft Decision

In relation to the proposed transformer replacement program, PB considered that SP AusNet had, in some instances, failed to take into account the use of strategic spares, units to be released from elsewhere on its network, and other economic means of mitigating the reliability consequences of transformer failure. PB recommended:

- removing the entire proposed capex allowance for transformer replacements at Bendigo and Yallourn;
- a coordinated replacement / augmentation with VENCorp at Dederang, in which SP AusNet and VENCorp each receive 50% of the cost; and
- inclusion of an allowance for replacement of one 220/66kV metropolitan transformer, rather than the proposed allowance for two replacements.

The AER accepted PB's recommendations with respect to SP AusNet's proposed transformer replacements at Bendigo and in the Melbourne metropolitan area. In relation to the Yallourn unit, the AER considered that a clear need for replacement with a unit reflective of its expected load has been demonstrated by SP AusNet.

Finally, the AER considered that SP AusNet had not demonstrated a pressing need for replacement of the unit at Dederang (based on its condition), and therefore no allowance for replacement was included in the Draft Decision. Overall, the AER considered that SP AusNet had not demonstrated that its proposed transformer replacements at Bendigo, Dederang and

one transformer in the Melbourne metropolitan area reasonably reflect prudent and efficient capex required to meet the capex objectives in clause 6A.6.7(a) of the NER. The AER made a downward adjustment to SP AusNet's proposed forecast capex allowance of $22.4m to reflect this assessment.

SP AusNet's response to the Draft Decision

The AER Draft Decision refers to and is based on information presented in the PB final report. SP AusNet has prepared a separate supporting paper (titled Transformer Replacement Program: 2007/8 – 2013/14 Capital Works Revised Proposal) which identifies errors of fact and incorrect interpretations and conclusions by the AER and its consultant, PB. That supporting paper also presents updated and further information in support of the need to replace the proposed transformers during the next regulatory period and not to defer this work. A copy of the supporting paper has been provided to the AER under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal. These documents have been provided to the AER under separate cover.)

As already noted above, the Draft Decision proposed the removal of a number of projects from SP AusNet's transformer replacement program, namely, BETS, DDTS, TTS-B3, RTS and a 150 MVA ASEA transformer. The supporting report provides evidence for the inclusion of these projects and demonstrates that the transformer replacement program set out in SP AusNet's original Revenue Proposal meets the requirements for the AER's acceptance in accordance with clause 6A.6.7(c) of the NER. The supporting paper also corrects several errors of fact contained in the AER's Draft Decision.

Since lodging its original Revenue Proposal, SP AusNet has updated its transformer model. This model is a tool used by SP AusNet to evaluate the need for corrective action based on an assessment of transformer condition. Details of the upgraded model are contained in section 7.3.1 of the supporting paper. The upgraded model now includes parameters that are understood by SP AusNet specialist engineers but were not explicitly documented in the earlier version of the Transformer Condition Ranking.

Customer future requirements and augmentations are considered with each transformer replacement. If these factors are ignored, station expansion and augmentation could be significantly more costly (and therefore more difficult to justify). From a project perspective it is less costly to install 2 transformers (one replacement and one augmentation) than to do the work as separate projects. The major beneficiary of this approach is the customer who gains the augmentation at a reduced cost compared to that of a stand alone project.

The project costs included in this Revenue Proposal cover only the asset replacement works required by SP AusNet to meet the capex objectives set out in clause 6A.6.7(a) of the NER. Customers will fund any incremental costs for augmentations. The motive for combining replacement and augmentation works, as proposed by SP AusNet, appears to have been misinterpreted by the AER.

In this regard, it is noted that the transformers removed from the program by the AER, apart from TTS and RTS, are stand alone projects that require replacement based on their condition and criticality. Replacement projects have been proposed along with customer augmentation works at stations where forecasts of increased capacity requirements have been published in annual planning documents. The replacement work is required and will proceed regardless of whether the customer determines augmentations are required or not. However there are significant efficiencies to be achieved through economies of scope if the augmentation and replacement projects are coordinated. As noted above, coordination of these works benefits customers generally and reduces the overall capital expenditure requirement. Where such coordination cannot be achieved the replacement project design considers the likely future requirements/augmentations required by customers and ensures that this can be included at the station simply and economically at the appropriate time in the future.

The updated condition assessment (set out in the supporting paper titled Thomastown Terminal Station Refurbishment; 2007/8 – 2013/14 Capital Works Revised Proposal) clearly demonstrates the need for replacement of TTS-B3. Replacement of this particular plant is most economically undertaken at the same time as the station rebuild project. Completion of the TTS-B3 replacement project separately from the station rebuild project would involve greater expenditure on items such as procurement, project and site establishment, foundations, outage coordination, control and protection, design and construction work.

Furthermore if the replacement is delayed more than about 4 years the station load growth will make it necessary to install the spare transformer to provide adequate transformation capacity during the changeover process. This alone would increase the project's complexity and would add a further $500,000 to the project costs. (It is also noteworthy that the spare transformer can only be used if it has not been deployed to cover a failure elsewhere in the system). Conservatively the project expenditure for transformer replacement will be at least $2.2M greater if not coordinated with the rebuild project. The updated transformer model and the NPV analysis strongly favour replacement with the station project. (Further details in relation to this are set out in the supporting paper titled Thomastown Terminal Station Refurbishment; 2007/8 – 2013/14 Capital Works Revised Proposal. A copy of that supporting been provided to the AER under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal.)

A similar argument applies to the BETS transformer replacement except the load at risk and the availability of outages are more critical at this station. There are only 2 transformers at BETS and because of the very high contingent costs involved, the customers at that station will not accept operation on one transformer for more than a few hours. (In the event of another incident at the station, customers risk loss of the whole station output when only one transformer is in service.)

In view of this situation, Powercor - the distribution business responsible for planning capacity augmentation at BETS - has made inquiries with SP AusNet regarding augmentation at BETS, ie a third transformer scheduled for service in 2012. Replacement of the BETS transformer as planned by SP AusNet can be coordinated with the proposed augmentation whereas deferring replacement will significantly increase costs associated with design, installation, procurement, switchyard work, outage coordination and customer works.

In relation to the possible use of spares, it is noted that the GNTS units have a lower rating than the BETS units and their use as spares will lower the rating of the bank of transformers at BETS. Also the use of such units as spare is tantamount to adopting a run to failure approach and this is not appropriate for transmission networks.

The DDTS transformer replacement is driven by the condition of the existing asset. The updated condition report is set out in the supporting report titled Transformer Replacement Program: 2007/8 – 2013/14 Capital Works Revised Proposal. SP AusNet's detailed planning for the replacement work has revealed that significant work will be required to keep the station capacity available during the replacement. (Any reduction in the station capacity reduces the interstate transfer capacity and can have an impact the on prices in the wholesale energy market.) The replacement project will avoid the potential impacts associated with asset failure, and will facilitate augmentation at the station in 2016 as indicated in the VENCorp APR. Deferral of the project increases the possibility of failure, with the consequential impact on the energy market.

The RTS transformers required the installation of sound barriers to contain noise levels to acceptable levels in accordance with environmental standards, and having regard to the now predominately residential area in which the terminal station is located. These barriers restricted the cooling air flow around the units and have caused them to operate at higher temperatures. This increased the rate of deterioration of units B1, B2 and B4 relative to similar units in the SP AusNet fleet. As a result units B1 and B2 now require remedial action to maintain reliable operation before replacement – not to extend their life. The condition reports set out in the

supporting papers (listed in Appendix J) indicate that replacement of units B1 and B2 is critical and cannot be deferred.

On the basis of the foregoing information, and the more detailed information set out in the supporting papers which have been lodged under separate cover[23] SP AusNet's revised capex proposal re-includes the transformer replacement works that the Draft Decision removed from the capital forecast. The updated condition reports set out in the supporting papers confirm the need for replacement of the transformers and the economic evaluation shows that it is the least cost option. There is some economic advantage if the work can be coordinated with customer augmentations but the emphasis is on replacement of these life expired transformers.

SP AusNet considers that the information set out above and in the detailed supporting papers (listed in Appendix J) demonstrates that SP AusNet's revised proposed allowance for the cost of the transformer replacement program reasonably reflects:

- the efficient costs of achieving the capital expenditure objectives set out in clause 6A.6.7(a) of the NER; and
- the costs that a prudent operator in the circumstances of SP AusNet would require to achieve the capital expenditure objectives.

On this basis, SP AusNet considers that the AER must, pursuant to clause 6A6.7(c) accept the inclusion of the revised proposed allowance for the cost of the transformer replacement program in the capital expenditure forecast.

Table 5.9.5 below sets out the revised proposed allowance for the cost of the transformer replacement program.

Table 5.9.5: Revised proposed allowance for the transformer replacement program ($m, 2007-08)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
SP AusNet's original proposal	3.50	5.40	2.00	5.50	7.90	4.50	28.80
AER Draft Decision allowance	0.00	0.00	4.50	1.90	0.00	0.00	6.40
SP AusNet's revised proposal	**3.50**	**5.40**	**2.00**	**5.50**	**7.90**	**4.50**	**28.80**

Source: SP AusNet

5.9.8 Replacement of station and control centre SCADA

Overview of the Draft Decision

In relation to the 'Replacement of station and control centre SCADA' project, the AER accepted PB's recommendation that SP AusNet had demonstrated a clear need to replace and upgrade its SCADA systems over the forthcoming regulatory control period.

The AER agreed with PB that SP AusNet had not demonstrated that the amount of $8.2m for enhancement to the SCADA system reasonably reflects prudent and efficient expenditure required to meet the capex objectives in clause 6A.6.7(a) of the NER. On this basis the AER made a downward adjustment to SP AusNet's proposed forecast capex allowance of $8.2 million.

SP AusNet's response to the Draft Decision

For the purpose of this revised Revenue Proposal, SP AusNet has accepted the Draft Decision's proposals regarding capital expenditure on replacement of station and control centre SCADA.

[23] Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal

5.9.9 CT replacement program

Overview of the Draft Decision

In relation to the proposed 'Replacement of post-type CTs' program, the AER agreed with PB that SP AusNet had demonstrated a need to replace CTs assessed as having a high risk of failure in the CT risk model. Further, the AER agreed that SP AusNet's proposed timing for replacement of CTs within this program appeared aggressive and inefficient in some cases, especially given that many of the assets proposed for replacement have been assigned a life expectancy in the CT risk model which extends significantly beyond the end of the forthcoming regulatory control period.

PB recommended removing the proposed capex allowance for replacement of all CTs assessed as having a life expectancy of greater than six years in the CT risk model, except at locations where it considers reasonable efficiencies can be captured by undertaking multiple replacements (of both high-risk and lower-risk CTs) at one time.

The AER largely accepted PB's recommendations, but included a capex allowance to replace all CTs with a life expectancy of seven years or less (rather than six), to allow SP AusNet some flexibility to prioritise replacement of the highest risk CTs over the forthcoming regulatory control period. The AER considered that an allowance of $15.41 million for the targeted CT replacement program (replacement of 49 out of the 73 sets proposed) will allow SP AusNet to achieve a significant (>20%) reduction in its overall level of CT failure risk over the forthcoming regulatory control period. The AER stated that it was not satisfied that an allowance for replacement of 24 sets of CTs reasonably reflects prudent and efficient capex required to meet the capex objectives over the forthcoming regulatory period. On this basis the AER made a downward adjustment of $9.09 million to SP AusNet's proposed forecast capex allowance to remove the capex allowance for replacement of 24 (out of 73) sets of CTs.

SP AusNet's response to the Draft Decision

The reduction in the capital expenditure allowance recommended by PB and adopted by the Draft Decision will not provide a sufficient allowance to enable SP AusNet to meet the capital expenditure objectives, having regard to the costs that a prudent operator in SP AusNet's circumstances would incur. In particular, the Draft Decision's proposed deferral of CT replacement capital expenditure will cause CT failure risks to rise over the period 2008-2014 and SP AusNet will thus be unable to comply with the Occupational Health and Safety Act to eliminate or reduce a known health and safety risk so far as is reasonably practical. Further, the rise in CT failure risk is likely to impose economic costs on users of SP AusNet's network (including Victorian consumers) through higher unsupplied energy risks.

The amendment recommended by PB is not efficient because its Net Present Value is significantly lower than that of SP AusNet's CT replacement program.

On the basis of the above considerations, it is SP AusNet's view that the level of expenditure recommended by PB in relation to CT replacement is:

- insufficient to enable SP AusNet to recover the efficient costs of achieving the capital expenditure objectives set out in clause 6A.6.7(a) of the NER; and is
- below the costs that a prudent operator in the circumstances of SP AusNet would require to achieve the capital expenditure objectives.

In particular, in regard to the capital expenditure objectives set out in the NER, the level of expenditure recommended by PB is, in SP AusNet's view:

- insufficient to enable SP AusNet to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services (clause 6A.6.7(a)(2)); and
- insufficient to enable SP AusNet to maintain the reliability, safety and security of the transmission system (clause 6A.6.7(a)(4)).

SP AusNet therefore considers that the AER must, pursuant to clause 6A.6.7(c) accept the inclusion of the allowance for CT replacement costs in the capital expenditure forecast, as detailed below.

Table 5.9.6 below sets out the revised proposed allowance and a conditional allowance for the CT replacement program. Further substantiation of SP AusNet' response to the Draft Decision, as well as details relating to the conditional allowance is set out in the supporting paper titled Current Transformer Replacements: 2008/09-2013/14 Capital Works Revised Proposal, a copy of which has been provided to the AER under separate cover.

Should the AER confirm, as proposed in the draft determination, a reduction in the CTs to be replaced in conjunction with station refurbishment and circuit breaker replacements; then an increase in like-for-like CT replacements is necessary to manage failure risks of 5 x 220 kV sets at BLTS and 15 x 66 kV sets at BLTS (3), GNTS (2), GTS (1), HOTS (2), KTS (3), RTS (1) and TTS (3).

The conditional like-for-like replacement program includes 8 sets at 500 kV, 74 sets at 330/275/220 kV, 15 sets at 66 kV and 17 capacitive voltage transformers at an estimated cost of $27.83 Million.

Table 5.9.6: Revised proposed allowance for CT replacement program ($m, 2007-08)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
SP AusNet's original proposal	4.8	6.1	5.2	4.2	2.7	1.4	24.5
AER Draft Decision allowance	2.8	2.5	2.4	2.8	2.3	2.5	15.4
SP AusNet's revised proposal	**4.8**	**6.1**	**5.2**	**4.2**	**2.7**	**1.4**	**24.5**
SP AusNet's conditional proposal	5.5	7.0	5.9	4.8	3.1	1.6	27.8

Source: SP AusNet

5.9.10 Vehicle replacement

Overview of the Draft Decision

With respect to the proposed vehicle replacement program (non-network capex), the AER accepted PB's recommendation to amend SP AusNet's allowance to reflect the actual replacement profile observed during the current regulatory control period. On this basis the AER made a downward adjustment of $3.42m to SP AusNet's proposed forecast capex allowance.

SP AusNet's response to the Draft Decision

SP AusNet accepts this aspect of the Draft Decision, and has adopted the Draft Decision's proposals regarding vehicle replacement costs in the preparation of this revised Revenue Proposal.

5.9.11 Inventory

Overview of the Draft Decision

The AER reviewed SP AusNet's documentation regarding its ex post capex on inventory, and agreed with PB that SP AusNet had incorrectly capitalised opex items (ie. 'normal store lines' – nuts, bolts, washers, etc) during the current regulatory control period. Based on its findings in the detailed ex post review of SP AusNet's proposed prudent capex allowance for inventory, PB recommended a downward adjustment of $0.24m to SP AusNet's forecast capex allowance for inventory to remove the capitalisation of 'normal store lines' going forward.

SP AusNet's response to the Draft Decision

SP AusNet accepts this aspect of the Draft Decision, and has adopted the Draft Decision's proposals regarding inventory costs in the preparation of this revised Revenue Proposal.

5.9.12 Replacement of 500 kV Circuit Breakers

Overview of the Draft Decision

The AER was not satisfied that SP AusNet's proposed replacement of a further two 500 kV CBs for release as spares is necessary in order to meet the capex objectives. At most, the AER considered that SP AusNet had justified the replacement of one 500 kV (3AT5) CB for release as an additional spare.

On this basis the AER made a conservative downward adjustment of $2.1 million to SP AusNet's proposed forecast capex allowance.

SP AusNet's response to the Draft Decision

In forming the view that the replacement of just one Siemens 3AT5 500 kV CB should be allowed in the capex forecast, the AER and Nuttall Consulting have incorrectly assumed that:

- the main components are interchangeable between all CBs in this fleet; and also
- the CB spares included in the estimated costs for the refurbishment program for the Siemens 3AT5 500 kV CBs includes all the spares likely to be required during refurbishment.

Hence, in order to continue the planned refurbishment program for the Siemens 3AT5 500 kV CBs in a cost effective and efficient way, it is necessary to replace two of these CBs (one of each type) in order to have available all of the components that are likely to be required during refurbishment.

On this basis, SP AusNet's revised capex forecast reinstates the $2.1M which was removed by the Draft Decision's downward adjustment to SP AusNet's original proposal of $4.2M.

SP AusNet has prepared further detailed information to substantiate its proposed replacement of 500 kV circuit breakers. This information is set out in the supporting paper titled Replacement Program for 500 kV Circuit Breakers – SP AusNet Response to AER Draft Decision Report. A copy of the supporting paper has been provided to the AER under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal. These documents have been provided to the AER under separate cover.)

SP AusNet considers that the information set out above and in the supporting paper demonstrates that SP AusNet's revised proposed allowance for the replacement of 500 kV CBs reasonably reflects:

- the efficient costs of achieving the capital expenditure objectives set out in clause 6A6.7(a) of the NER; and
- the costs that a prudent operator in the circumstances of SP AusNet would require to achieve the capital expenditure objectives.

On this basis, SP AusNet considers that the AER must, pursuant to clause 6A.6.7(c) accept the inclusion of the revised allowance for the replacement of 500 kV CBs in the capital expenditure forecast.

Table 5.9.7 below sets out the revised proposed allowance for the replacement of 500 kV CBs.

Table 5.9.7: Revised proposed allowance for replacement of 500 kV CBs ($m, 2007-08)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
SP AusNet's original proposal	3.50	0.7					4.20
AER Draft Decision allowance		2.10					2.10
SP AusNet's revised proposal	**3.50**	**0.7**					**4.20**

Source: SP AusNet

5.9.13 Replacement of 66 kV Circuit Breakers

Overview of the Draft Decision

The AER undertook an analysis of the information presented by SP AusNet regarding the 66 kV CB replacements at HOTS and MWTS. The AER considered that SP AusNet had not demonstrated a clear economic need to replace these units over the forthcoming regulatory control period. The CB risk model outputs indicated that the units proposed for replacement are in relatively good condition, and they are expected to last in service for up to 15 years. In relation to the release of spare units for maintenance purposes, the AER considered that SP AusNet should consider utilising 66 kV units released from its station rebuild program. The AER also noted that SP AusNet currently holds a number of spare 66 kV CB units for contingency planning purposes.

The AER said that it is not satisfied that the proposed replacement of 66 kV CBs at HOTS and MWTS reasonably reflects prudent and efficient capex required to meet the capex objectives over the forthcoming regulatory control period.

The AER made a downward adjustment of $3.5 million to SP AusNet's proposed forecast capex allowance.

SP AusNet's response to the Draft Decision

SP AusNet has prepared a paper (titled 66 kV CB Replacement Program: 2008-2014 capital works justification for excluded works – post AER/PB review) which provides a detailed justification for the inclusion of the 66 kV CBs that the Draft Decision removed from the capex forecast. A copy of the supporting paper has been provided to the AER under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal. These documents have been provided to the AER under separate cover.)

The supporting paper examines the key asset replacement drivers, and indicates clearly that SP AusNet's proposed 66kV CB replacement program together with the 66kV CB replacement

works in various station rebuild projects is not predicated, as the Draft Decision (and PB's report) suggest, by a sole desire to replace a particular asset class over the next three regulatory periods. The supporting paper describes the asset replacement drivers and other considerations that have led to the selection of those CBs included in the revised capex program for replacement. It is noted that not all CBs proposed for replacement have asset condition as the primary driver.

The asset replacement drivers include:

(a) Asset Condition

(b) Fault Current

(c) Efficiency

(d) Health & Safety

(e) Compliance

(f) Fleet Management

These drivers, and their impact on the revised 66 kV CB replacement program are considered in further detail below.

(a) Asset Condition

SP AusNet's CB Risk Model provides an effective tool, or 'robust indicator' as suggested by the AER and PB, for identifying prudent replacement priorities with respect to the various asset classes of SP AusNet's asset base. With this modelling in its early stages of development, as acknowledged by the Draft Decision and PB's report, providing transparency of poor performing cohorts within a particular asset class can be problematic because the averaging of performance across asset classes disguises poor performance of a smaller population of the overall fleet.

Accordingly, SP AusNet has now undertaken prioritisation of asset condition down to a station by station level that also reflects concerns raised by personnel directly engaged in the day-to-day management of these assets. On the basis of asset condition, LG4Cs at BLTS, GNTS, GTS and MWTS together with S&S 509s at GNTS, GTS, KTS and TTS have been identified as drivers for replacement in the 2008-2014 rate reset period.

(b) Fault Current

VENCorp's 2007 Electricity Annual Planning Report highlights those stations where fault current is approaching the full rating of the existing 66kV CBs. Co-ordination of SP AusNet's asset condition and replacement priorities with station rebuild works provides a key benefit in the avoidance of additional costs associated with CB fault current uprating works that would otherwise be required later. All users of SP AusNet's network (including end use customers) benefit from these cost reductions.

(c) Efficiency

Economic modelling on an individual CB level for those CBs identified in poor performing fleet cohorts indicates the optimum timing for their replacement being over the 2008-2014 regulatory period. This modelling has not included the complex economic analysis of CB failure probability and consequence for multiple and concurrent CB failures beyond the identified optimum replacement period of individual CBs. Failure beyond the optimum replacement point (technical life) is discussed in Section 4.6 of the supporting paper titled 66 kV CB Replacement Program: 2008-2014 capital works justification for excluded works – post AER/PB review.

Efficiencies are also achieved through integration with required protection scheme upgrades where current performance is sub-optimal and/or at risk.

(d) Health & Safety

SP AusNet does not consider it prudent asset management practice to have personnel directly exposed to CBs through operating and maintenance activities that are:

- within a poor-performing fleet cohort, and
- exposed to fault current at full CB rating.

(e) Compliance

Addition of transformation capacity at BLTS and GNTS exceeds 66kV CB ratings. Maintenance of engineering standards require the proposed asset works to be undertaken in accordance with industry standards. Therefore, the CBs at those stations should be replaced with those having the required ratings.

(f) Fleet Management

SP AusNet's large LG4C fleet exhibits a non-homogenous nature in terms of asset condition. This is believed to be primarily a function of the different operating environments and duty cycles that these assets are exposed to. A primary objective of SP AusNet's asset management strategy is to ensure the business is not exposed to a significant business risk due to a large number of assets failing as they approach their full technical lives.

Utilising asset condition as the primary driver, co-ordination with other asset replacement drivers has identified the opportunity to cost effectively replace 81 LG4C and 12 S&S 509 CBs excluded from SP AusNet's original capex proposal by the Draft Decision.

SP AusNet considers that the information summarised above and set out in the supporting paper titled 66 kV CB Replacement Program: 2008-2014 capital works justification for excluded works – post AER/PB review demonstrates that SP AusNet's revised proposed allowance for the replacement of 66 kV CBs reasonably reflects:

- the efficient costs of achieving the capital expenditure objectives set out in clause 6A.6.7(a) of the NER; and
- the costs that a prudent operator in the circumstances of SP AusNet would require to achieve the capital expenditure objectives.

In particular, in regard to the capital expenditure objectives set out in the NER, the level of expenditure proposed in the Draft Decision for replacement of 66 kV Circuit Breakers is, in SP AusNet's view:

- insufficient to enable SP AusNet to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services (clause 6A.6.7(a)(2));
- insufficient to enable SP AusNet to maintain the reliability and security of supply of prescribed transmission services (clause 6A.6.7(a)(3)); and
- insufficient to enable SP AusNet to maintain the reliability, safety and security of the transmission system (clause 6A.6.7(a)(4)).

On this basis, SP AusNet considers that the AER must, pursuant to clause 6A.6.7(c) accept the inclusion of the revised allowance for the replacement of 66 kV CBs in the capital expenditure forecast.

Table 5.9.8 below sets out the revised proposed allowance for the replacement of 66 kV CBs.

Table 5.9.8: Revised proposed allowance for replacement of 66 kV CBs ($m, 2007-08)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
SP AusNet's original proposal	1.27	2.06	0.14	0.02	0.00	0.00	3.49
AER Draft Decision allowance	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SP AusNet's revised proposal	**1.27**	**2.06**	**0.14**	**0.02**	**0.00**	**0.00**	**3.49**

Source: SP AusNet

5.9.14 Redevelopment of Brooklyn Terminal Station (BLTS)

Overview of the Draft Decision

The AER's Draft Decision concluded that SP AusNet had not demonstrated a need for the replacement of assets within 66kV switchyards for five out of the six station projects (one of which is BLTS). The AER noted that SP AusNet's proposed redevelopment of 66 kV switchyards appears to be driven by its strategic aim to phase out all bulk-oil CBs over the next fifteen years, in particular its large fleet of 66kV 'LG4C' bulk-oil CBs.

The AER noted that all of the 66kV CBs proposed for replacement as part of these six station projects (around 70 in total) have been assigned an asset failure risk ranking of 'Medium/Low' in the CB risk model, corresponding to a Mean Time Between Failure (MTBF) of between 19.38 and 29.82 years. In addition, the AER noted that SP AusNet's AMS documentation confirmed that the assets are in relatively good condition.

Based on the information provided by SP AusNet, the AER considered that the need and economic justification for replacement of assets within 66 kV switchyards (particularly the LG4C fleet of CBs) over the forthcoming regulatory control period is questionable. The AER did not accept SP AusNet's claims that advanced replacement of 66kV CBs is required over the forthcoming regulatory control period so as to prevent a 'bow-wave' of replacement in future regulatory control periods.

SP AusNet's response to the Draft Decision

SP AusNet has prepared a paper (titled Brooklyn Terminal Station Redevelopment 2007/8-2013/14 Capital Works: Revised Proposal) which provides a detailed justification for the proposed refurbishment of BLTS. A copy of the supporting paper has been provided to the AER under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal. These documents have been provided to the AER under separate cover.)

The AER removed the costs for the replacements of the 220kV and 66kV switchbays recommended by SP AusNet, but accepted that the cost for the transformers was reasonable. It should be noted, however, that SP AusNet's original revenue proposal had only included the cost of 5 transformers not the 9 that are at the station.

As a result of the integration of the 220kV and 66kV switchyard works, SP AusNet was able to reconfigure the station and reduce the number of transformers to 5. This results in a lower overall cost when the combined cost of the switchbays and transformers is taken into account.

Further analysis of the 220kV CB data has shown that four of the five CBs planned to be replaced are older than indicated in the risk model and further evidence is provided to show that these CB's will be in the Very High Risk category in 2013, which is immediately after SP AusNet's scheduled replacement date.

Also further supporting analysis on the LG4C fleet has shown that the LG4C CB's at BLTS are poorer performing compared to the rest of the fleet and are operating close to their full fault level at a stage when they have had over 40 years of wear and tear.

Economic analysis of a number of options has been conducted and SP AusNet's recommended option is the least cost option unless the 220kV and 66kV switchbay replacements are deferred to at least 2020, more than 8 years after the planned replacement and well past the optimum time for replacement of this equipment. This exposes the network and customers to considerable additional risk in this period for no economic benefit.

SP AusNet considers that the information set out in the supporting paper (noted above and referenced in Appendix J) demonstrates that SP AusNet's revised proposed allowance for the redevelopment of BLTS reasonably reflects:

- the efficient costs of achieving the capital expenditure objectives set out in clause 6A.6.7(a) of the NER; and
- the costs that a prudent operator in the circumstances of SP AusNet would require to achieve the capital expenditure objectives.

On this basis, SP AusNet considers that the AER must, pursuant to clause 6A.6.7(c) accept the inclusion of the revised proposed allowance for the redevelopment of BLTS in the capital expenditure forecast.

Table 5.9.9 below sets out the revised proposed allowance for the redevelopment of BLTS.

Table 5.9.9: Revised proposed allowance for redevelopment of BLTS ($m, 2007-08)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
SP AusNet's original proposal	0.00	0.00	5.19	29.87	16.80	0.00	51.85
AER Draft Decision allowance	0.00	0.00	4.65	21.60	15.05	0.00	41.29
SP AusNet's revised proposal	**0.00**	**0.00**	**5.19**	**29.87**	**16.80**	**0.00**	**51.85**

Source: SP AusNet

5.9.15 Refurbishment of Thomastown Terminal Station (TTS)

Overview of the Draft Decision

For the reasons outlined in respect of the redevelopment of Brooklyn Terminal Station (see section 5.9.14 above), the AER also concluded that SP AusNet had not demonstrated a need for the replacement of assets within 66kV switchyards for Thomastown Terminal Station (TTS).

SP AusNet's response to the Draft Decision

SP AusNet has prepared a paper (titled Thomastown Terminal Station Refurbishment; 2007/8 – 2013/14 Capital Works Revised Proposal) which provides a detailed justification for the proposed refurbishment of TTS. A copy of the supporting paper has been provided to the AER under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal. These documents have been provided to the AER under separate cover.)

The upgraded transformer assessment model[24] indicates that the B2 and B3 transformers require replacement. In its Draft Decision, the AER agreed with the B2 assessment. The B3 assessment has been upgraded with the model and further evidence from the transformer history to show that the core and windings have deteriorated more than originally assessed. The TCR score of 54 puts this unit at the same level of deterioration as the TTS B2 unit and therefore satisfies replacement criteria. Given this condition score it is important to proceed with the replacement.

[24] Transformer Replacements

From an economic viewpoint, deferring the replacement incurs significant additional expense that makes this option more costly for customers. The additional costs are required to establish a new project, design costs, procurement, heavy lift and transport, disposal, foundations and drainage, secondary works for protection and control, mobilise construction crews and project management. There is also the need to install the spare transformer to provide adequate capacity if B3 is not replaced with the station project as planned. The additional costs to replace B3 as a separate project, including the installation of the spare, amounts to an extra $2.2M. The extra costs incurred as a separate project make this uneconomic unless the project is deferred for more than 8 years, which is not appropriate given the poor condition of the transformer (refer to Transformer Replacements, section 4.1.2.3 and Table 1).

The replacement of the switching CB's is normally associated with the transformer replacement where the CB's are a similar age to the transformer. In this case both the B2 and the B3 transformers are switched by LG4C's and their replacement with the transformer is planned. The economics are driven by outages and safety of work. A transformer may take a month to changeover. During that time the CB is out of service and there is plenty of time to complete its replacement. When undertaken separately, the changeover of the CB may take 4-5 days and during this time the transformer is out of service, causing a capacity limitation at the Terminal Station. Customers do not allow transformer outages of this duration where there is no recall time in the event of other failures at the station. Hence replacement of transformer CB's is difficult and expensive when not done with the overall station project

The rating of the LG4C CB's is less than the cyclic rating of the transformers and hence the full rating will not be available under emergency conditions. This is neither a good engineering practice nor an economic solution for transformers that supply a large part of the Northern suburbs of Melbourne.

The bus tie CB's associated with B2 and B3 should also be replaced because they may be required to carry the transformer current under emergency conditions. Therefore the bus tie CB's 1-2, 2-3 and 3-4, which are also part of the bulk oil CB fleet should also be replaced.

SP AusNet submits that it is important to replace the B3 transformer, the 66 kV transformer CB's for B2 and B3 and the adjacent bus tie CB's. There is not the same compelling evidence for replacement of the feeder CB's and this could be deferred for one regulatory period. By that time, however, the average age will be 49 years and beyond the normal life expectancy for those assets

SP AusNet considers that the information set out in the supporting paper (noted above and referenced in Appendix J) demonstrates that SP AusNet's proposed allowance for the refurbishment of TTS reasonably reflects:

- the efficient costs of achieving the capital expenditure objectives set out in clause 6A.6.7(a) of the NER; and
- the costs that a prudent operator in the circumstances of SP AusNet would require to achieve the capital expenditure objectives.

On this basis, SP AusNet considers that the AER must, pursuant to clause 6A.6.7(c) accept the inclusion of the following allowance for the refurbishment of TTS in the capital expenditure forecast. Table 5.9.10 below sets out the revised proposed allowance for the refurbishment of TTS.

Table 5.9.10: Revised proposed allowance for refurbishment of TTS ($m, 2007-08)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
SP AusNet's original proposal	3.90	22.92	15.37	1.54	0.00	0.00	43.73
AER Draft Decision allowance	-2.14	-9.06	0.00	0.00	0.00	0.00	-11.20
SP AusNet's revised proposal	**3.90**	**22.92**	**15.37**	**1.54**	**0.00**	**0.00**	**43.73**

Source: SP AusNet

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

5.9.16 Refurbishment of Ringwood Terminal Station (RWTS)

Overview of the Draft Decision

The Draft Decision accepted that the proposed works at RWTS are required, however the contingency allowance associated with that project was removed.

SP AusNet's response to the Draft Decision

Section 5.9.2 (above) sets out SP AusNet's response in relation to the treatment of project contingency allowances. The total amounts for revised proposed contingency allowances shown in the table in section 5.9.2 incorporate SP AusNet's revised proposed contingency allowance for the refurbishment of RWTS.

5.9.17 Refurbishment of Glenrowan Terminal Station (GNTS)

Overview of the Draft Decision

For the reasons outlined in respect of the redevelopment of Brooklyn Terminal Station (see section 5.9.14 above), the AER also concluded that SP AusNet had not demonstrated a need for the replacement of assets within 66kV switchyards for Glenrowan Terminal Station (GNTS).

SP AusNet's response to the Draft Decision

SP AusNet has prepared a paper (titled Glenrowan Terminal Station Redevelopment 2008/09-2013/14 Capital Works Revised Proposal) which provides a detailed justification for the proposed refurbishment of GNTS. A copy of the supporting paper has been provided to the AER under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal. These documents have been provided to the AER under separate cover.)

The 66 kV circuit breakers at GNTS will have delivered 44 years service at the time of the proposed replacement, making them amongst the oldest in the Victorian electricity transmission 66 kV fleet. The LG4C circuit breakers at GNTS do not have a Mean Time Between Failures (MTBF) between 19 and 29 years, as stated on page 307 of the Draft Decision. In fact, these circuit breakers are part of a smaller cohort which have a maintenance frequency almost 3 times higher than that of a new circuit breaker, and a MTBF of 7 years. The S&S type 509 circuit breaker at GNTS has a maintenance frequency of more than 3 times that of a new circuit breaker and an MTBF of less than 2 years. Net Present Value studies indicate that the optimum timing for replacement of LG4C circuit breakers from the poorer performance cohort, such as those CBs at GNTS, is in the period from 45 to 55 years service life.

The current transformers associated with the S&S type 509 circuit breaker will have 6 years remaining life at 2011/12 and accordingly have relatively high failure risks. Net Present Value studies on current transformer replacements demonstrate that the optimum time for replacement is when CTs are assessed to have between 5 years and 10 years of remaining life as is the case at GNTS. Deferring replacement of CTs (with less than 5 years remaining life) is not efficient.

The electromechanical protection relays associated with the 66 kV circuit breakers at GNTS will have delivered in excess of 30 years service at 2011/12 and are considered to be at the end of their technical and economic life.

The integration of 66 kV circuit breaker, current transformer and associated secondary works with the replacement of 220 kV circuit breakers and #1 transformer bank at GNTS, commencing in 2011/12, is the least cost proposal for the 2008-2014 regulatory period and the following

regulatory period. In SP AusNet's view, it would be imprudent and inefficient to adopt the AER's proposal to defer replacement of 66 kV circuit breakers, current transformers and associated secondary equipment at GNTS.

On the basis of the above considerations, it is SP AusNet's view that the level of expenditure recommended by the AER in relation to the GNTS re-development project is:

- insufficient to enable SP AusNet to recover the efficient costs of achieving the capital expenditure objectives set out in clause 6A.6.7(a) of the NER; and is
- below the costs that a prudent operator in the circumstances of SP AusNet would require to achieve the capital expenditure objectives.

In particular, in relation to the capital expenditure objectives set out in the NER, the level of expenditure recommended by AER is, in SP AusNet's view:

- insufficient to enable SP AusNet to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services (clause 6A.6.7(a)(2)); and
- insufficient to enable SP AusNet to maintain the reliability, safety and security of the transmission system (clause 6A6.7(a)(4)).

SP AusNet considers that the information set out in the supporting paper (noted above and referenced in Appendix J) demonstrates that the AER must, pursuant to clause 6A.6.7(c) accept the inclusion of the revised allowance for the refurbishment of GNTS in the capital expenditure forecast, as detailed below:

- Reinstate the $4.92 M funding removed from the GNTS re-development project for the replacement of 6 x 66kV LG4C circuit breakers and 1 x 66 kV S&S type 509 circuit breaker and the associated secondary equipment.
- Include a risk allowance of $1.5M in the project forecast for the financial risk as estimated by Evan and Peck.

Table 5.9.11 below sets out the revised proposed allowance for the refurbishment of GNTS.

Table 5.9.11: Revised proposed allowance for refurbishment of GNTS ($m, 2007-08)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
SP AusNet's original proposal	0.0	0.0	0.0	0.43	6.82	14.07	21.32
AER Draft Decision allowance	0.0	0.0	0.0	0.43	4.37	11.62	16.41
SP AusNet's revised proposal	0.0	0.0	0.0	0.43	6.82	14.07	21.32

Source: SP AusNet

5.9.18 Refurbishment of Keilor Terminal Station (KTS)

Overview of the Draft Decision

For the reasons outlined in respect of the redevelopment of Brooklyn Terminal Station (see section 5.9.14 above), the AER also concluded that SP AusNet had not demonstrated a need for the replacement of assets within 66kV switchyards for Keilor Terminal Station (KTS).

SP AusNet's response to the Draft Decision

SP AusNet has prepared a paper (titled Keilor Terminal Station 220/66 kV Refurbishment 2007/08-2013/14 Capital Works Revised Proposal) which provides a detailed justification for the proposed refurbishment of KTS. A copy of the supporting paper has been provided to the AER

under separate cover. (Note that Appendix J lists all supporting documents that provide further substantiation of SP AusNet's revised capex proposal. These documents have been provided to the AER under separate cover.)

This project, including the 66kV switchyard works, was approved by the SP AusNet Board on 8th of March 2007. Procurement of major plant for this project has already occurred and the design and drafting relating to this project (including the 66kV switchyard refurbishment) is in progress.

By the integration of the 220kV and 66kV switchyard works, SP AusNet was able to create an efficient work package that removed several plant items with high OH&S risk. The combined 220kV and 66kV switchyard refurbishment resulted in a lower overall PV cost than the alternative options considered by SP AusNet.

Analysis on the 66kV circuit breaker fleet shows that, at KTS, they are operating close to their full fault level at a stage when they have had over 40 years of wear and tear. All the 66kV circuit breakers identified for replacement in this proposal will need to be replaced before the planned installation of a fifth transformer at KTS in 2010, as this will increase the fault levels well above the operating limits of this equipment. By bringing forward and integrating these 66kV fault level mitigation works into the program for the 220kV switchyard refurbishments considerable efficiencies are realised and these savings are past onto the end users.

In this revised proposal rather than use an inefficiency factor in the economic analysis (as previously proposed) SP AusNet has estimated the costing for splitting the program of works into a 220kV program and a 66kV program (as recommended by the AER). Using these costs an economic analysis of three options has been conducted. The SP AusNet recommended option of a combined 220 and 66kV switchyard refurbishment is still the least cost option unless the 66kV switchbay replacements are deferred until at least 2017, more than 8 years after the planned replacement and well past the optimum time for replacement of this equipment. This exposes the network and customers to considerable additional risk in this period for no economic benefit.

SP AusNet considers that the information set out in the supporting paper (noted above and referenced in Appendix J) demonstrates that the proposed allowance for the refurbishment of KTS reasonably reflects:

- the efficient costs of achieving the capital expenditure objectives set out in clause 6A.6.7(a) of the NER; and
- the costs that a prudent operator in the circumstances of SP AusNet would require to achieve the capital expenditure objectives.

Table 5.9.12 below sets out the revised proposed allowance for the refurbishment of KTS.

Table 5.9.12: Revised proposed allowance for refurbishment of KTS ($m, 2007-08)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
SP AusNet's original proposal	15.14	12.22	0.25	3.92	8.09	0.00	39.62
AER Draft Decision allowance	13.58	8.58	0.25	3.92	8.09	0.00	34.42
SP AusNet's revised proposal	15.14	12.22	0.25	3.92	8.09	0.00	39.62

Source: SP AusNet

5.9.19 Refurbishment of Geelong Terminal Station (GTS)

Overview of the Draft Decision

For the reasons outlined in respect of the redevelopment of Brooklyn Terminal Station (see section 5.9.14 above), the AER also concluded that SP AusNet had not demonstrated a need for the replacement of assets within 66kV switchyards for Geelong Terminal Station (GTS).

SP AusNet's response to the Draft Decision

For the purpose of preparing this revised Revenue Proposal, SP AusNet has accepted the Draft Decision's proposed capex allowance for refurbishment of Geelong Terminal Station.

5.9.20 Refurbishment of Hazelwood Terminal Station (HWTS)

Overview of the Draft Decision

The Draft Decision accepted that the proposed works at HWTS are required, however the contingency allowance associated with that project was removed.

SP AusNet's response to the Draft Decision

Section 5.9.2 (above) sets out SP AusNet's response in relation to the treatment of project contingency allowances. The total amounts for revised proposed contingency allowances shown in the table in section 5.9.2 incorporate SP AusNet's revised proposed contingency allowance for the refurbishment of HWTS.

5.10 SP AusNet's Capex Forecast for this Revised Revenue Proposal

The revised proposed capex program continues and builds on the successfully completed capex program for the current regulatory control period. Importantly, in accordance with the NER, it also responds specifically to the matters raised by the AER in its Draft Decision.

In light of the company's 2002 revenue proposal, the requirement to increase capital expenditure in the forthcoming regulatory control period is not unexpected. The programmed increase in the volume of capital works is driven by:

- the continued rollout of the major terminal station rebuild projects. This includes more difficult and complex work in confined city sites, where supply must be fully maintained throughout the renewal work and conversion to more expensive, compact gas-insulated switchgear is required to allow for expansion to meet future demand;
- a substantial increase (from 12 to 40) in the number of transformers being replaced over the period; and
- there is further expansion in the amount of compliance-related expenditure required in relation to occupational health and safety, environmental protection and infrastructure security. This expenditure is not discretionary.

In addition to this anticipated increase in the volume of capital expenditure, a number of external factors are acting to put upward pressure on input prices, and this will exacerbate the required increase in capital expenditure.

The capital expenditure program in this revised Revenue Proposal is predominately based on the replacement of existing assets, as their condition deteriorates, to ensure the ongoing

reliability and security of the transmission network. This is to be expected as the majority of SP AusNet's 220 kV system and associated 22 kV and 66 kV connection assets at terminal stations were built between 1955 and 1970. Primary Terminal Station assets are expected to last 45 years on average, although the range is generally between 40-50 years, depending on the actual condition of the asset.

The revised capital expenditure program represents an optimal balancing of the costs of asset replacement and maintenance on the one hand and the risk and costs of deteriorating reliability and asset performance on the other. The program is aimed at ensuring the ongoing maintenance of network reliability and service standards in accordance with customers' needs whilst minimising the total life cycle cost of service.

The revised capex proposal is shown in Table 5.10.1 below.

Table 5.10.1: Total Capex 2008/09 to 2013/14 – by Asset Class (real 2007/08$) for revised Revenue Proposal

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Total
Secondary	22.3	15.4	25.3	20.1	17.1	4.9	105.0
Switchgear	38.1	42.4	46.3	47.0	41.7	71.4	287.0
Transformers	9.6	11.5	21.6	10.9	37.3	31.3	122.2
Reactive	6.9	1.2	4.2	9.4	1.5	11.0	34.1
Towers and Conductors	6.3	4.8	2.9	6.5	8.0	5.2	33.5
Establishment	19.3	51.5	19.7	31.2	16.9	17.5	156.1
Communications	11.5	2.3	15.1	13.8	0.0	1.9	44.6
Non System	9.5	11.1	8.0	8.5	9.8	9.4	56.3
Revised Total	**123.6**	**140.1**	**143.0**	**147.3**	**132.3**	**152.5**	**838.8**
Original Total	128.6	121.7	156.8	150.8	123.3	157.4	838.6

Note: Capex as commissioned (6 months IDC excluded)

Source: SP AusNet PTRM

6 Operating Expenditure Proposal

6.1 Introduction

Clause 6A.6.6 of the NER requires SP AusNet to present its opex requirements for the forthcoming regulatory control period in order to:

- meet the expected demand for prescribed transmission services over that period;
- comply with all applicable regulatory obligations associated with the provision of prescribed transmission services; and
- maintain the reliability, safety and security of the transmission system through the supply of prescribed transmission services.

In addition, Schedule 6A.1.2 describes the type of accompanying information that SP AusNet must provide in order to explain and justify its forecast operating expenditure (opex). SP AusNet's original Revenue Proposal provided the following information:

- an overview of historic and forecast opex;
- a description of factors that will affect opex in the forthcoming regulatory control period;
- a brief description of the forecasting methodology employed and the assumptions underpinning the opex forecast;
- a detailed presentation of SP AusNet forecast opex, for each of the following categories;
  - *routine maintenance;*
  - *asset works;*
  - *corporate costs; and*
  - *other costs.*

In its Draft Decision, the AER did not fully accept SP AusNet's opex proposal. In presenting this revised Revenue Proposal, SP AusNet's view is that the above material provided by SP AusNet in its original Revenue Proposal is still highly relevant, particularly in providing helpful background to and support for the revised operating expenditure proposal.

In light of these comments, sections 6.2 to 6.9 below are substantially unchanged from the original Revenue Proposal, apart from appropriate changes to headings and text to make it clear that these sections contain data that relates to the original Revenue Proposal[25]. A new section 6.10 specifically addresses matters raised in the Draft Decision, and includes appropriate cross-references to new supporting appendices. A new section 6.11 concludes with a presentation of SP AusNet's revised operating expenditure proposals in light of the matters raised in the AER's Draft Decision. SP AusNet believes that this approach will assist stakeholders to identify the changes made since SP AusNet's original Revenue Proposal and the reasons for those changes.

Interested parties should be aware that SP AusNet submitted supplementary information to the AER on 30 April 2007in relation to the following matters:

[25] In addition, cross-referencing to Appendix G has been added. Appendix G reproduces the supplementary information that the AER requested following the initial lodgement of SP AusNet's original Revenue Proposal. The supplementary information was originally submitted by SP AusNet on 30 April 2007.

- forecast operating expenditure;
- the interaction between capex and opex; and
- self insured risks and deductibles.

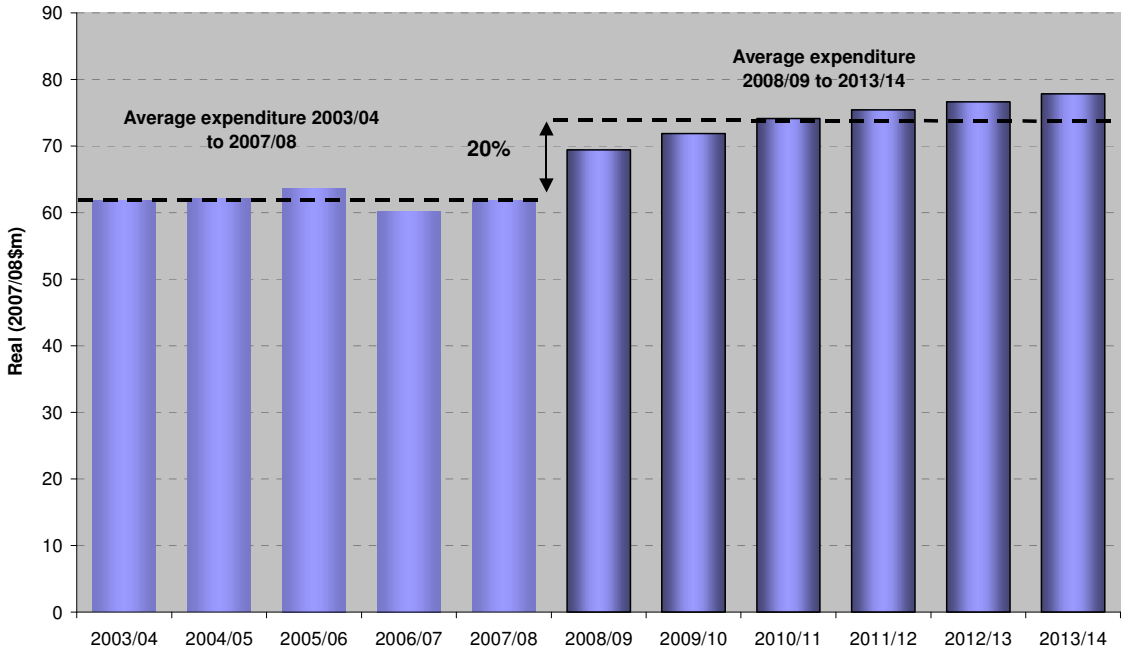
The information provided supplements that contained in SP AusNet's original Revenue Proposal, and was submitted in response to a request issued by the AER pursuant to clause 6A.11.1 of the NER. For ease of reference, this supplementary information is set out in Appendix H. Supplementary information relating to forecast operating expenditure is provided in section 1.4 of Appendix H. Supplementary information regarding the integration between capex and opex is provided in section 1.7 of Appendix H. Supplementary information regarding self insured risks and deductibles is provided in section 1.10 of Appendix H.

6.2 Overview of Historic and Forecast Operating Expenditure Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal provided an overview of SP AusNet's historic and forecast opex as set out in Figure 6.2.1. In summary, this information indicates that total operating expenditure must increase in the forthcoming regulatory control period if SP AusNet is to satisfy its compliance obligations and to meet the needs of its customers.

Despite the upward pressures on operating and maintenance expenditure (explained in detail below), SP AusNet will continue to contain expenditure over the forthcoming regulatory control period. SP AusNet's original Revenue Proposal explained that average annual expenditure for the forthcoming regulatory period is expected to increase by 20 percent in real terms compared to the average annual expenditure in current period.

Figure 6.2.1 Real Opex 2003/04 to 2013/14 (Actual and Proposed) (real 2007/08 $m) Submitted by SP AusNet in its Original Revenue Proposal*



* Actual to December 2006, forecast to 2013/14

* From 2003/04 to 2007/08 excludes easement tax, glide path for opex, debt and equity raising costs and rebates, from 2007/08 to 2013/14 excludes easement tax, glide path for opex, debt and equity raising costs and rebates, however, it includes SP AusNet's claim for self-insurance.

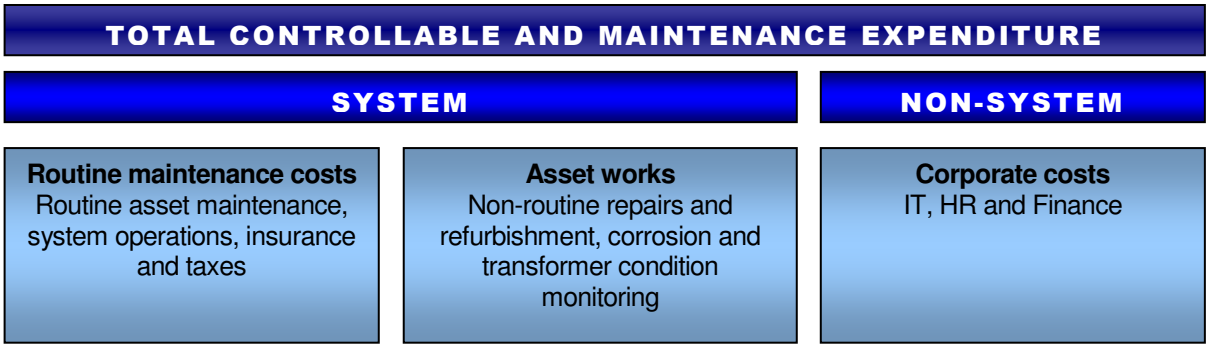
Source: SP AusNet

SP AusNet distinguishes between three principal types of opex for performance monitoring purposes:

- Routine maintenance and operations – system recurrent costs directly attributable to maintaining and operating the transmission network including maintenance and other costs such as insurance and taxes;
- Corporate Support – non-system recurrent costs that encompass activities and services which are not directly related to maintaining or operating the network including finance, Information Technology (IT) and Human Resources (HR); and
- Asset works – non-recurrent system costs that are directed at addressing specific problems on the transmission system.

Figure 6.2.2 provides a framework for categorizing operating expenditure between system and non-system costs.

Figure 6.2.2 SP AusNet's Opex Framework

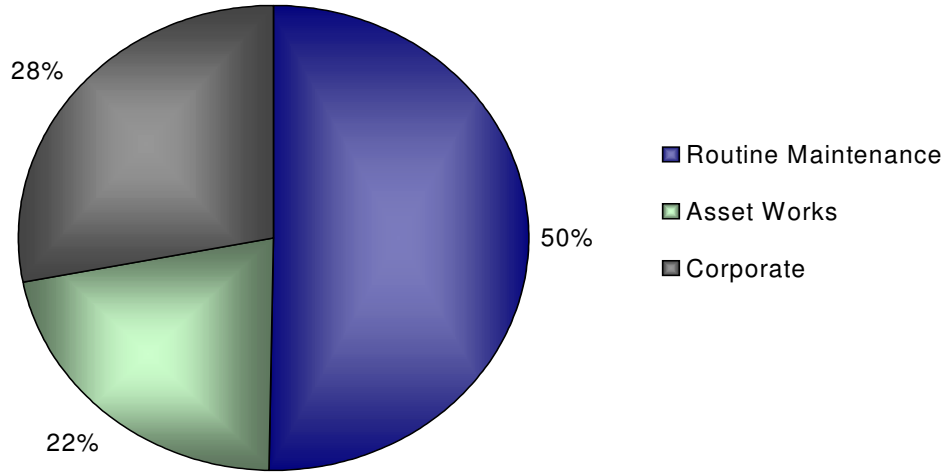


Source: SP AusNet

In addition to these three principal controllable cost categories, SP AusNet's original Revenue Proposal identified a fourth category ("other costs") for the purpose of substantiating its Revenue Proposal for the forthcoming regulatory period. This category includes debt and equity raising costs, rebates, self-insurance, easement tax and glide path. SP AusNet has separated this category in order to identify the ex-ante cost allowance.

SP AusNet's original Revenue Proposal provided a breakdown of the opex program as shown in Figure 6.2.3. The percentages shown in Figure 6.2.3 will be different in SP AusNet's revised Revenue Proposal, but the proportions between the various categories will be broadly similar.

Figure 6.2.3 Breakdown of operating expenditure 2008/09 to 2013/14



Source: SP AusNet

6.3 Factors Affecting Future Operating Expenditure Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that considerable efficiency savings have been delivered during the current regulatory period, which will flow to consumers in the forthcoming regulatory period. SP AusNet's efficient asset management and performance is described in detail in Chapter 3 of this revised Revenue Proposal.

Table 6.3.1 compares SP AusNet's benchmark allowance established by the ACCC's 2002 decision[26] and the company's actual opex (excluding debt and equity raising costs, self-insurance, rebates and easement tax) during the current regulatory control period. SP AusNet's opex from the current regulatory period averaged 11.9 percent below the AER benchmark.

SP AusNet experienced a one-off cost-saving in 2006 / 07 when the SPI PowerNet (transmission) business and the TXU (distribution) business merged. The merger of the transmission and distribution businesses has achieved cost savings through realised synergies such as economies of scale and scope. However, these savings are a one-off and are unlikely to continue in the future regulatory period. This issue is addressed in further detail in section 6.10 of this revised Revenue Proposal.

Table 6.3.1: Opex comparison (real 2007/08 $m)

Year	2003^	2003/04	2004/05	2005/06	2006/07*	2007/08*
Decision (CPI adjusted)	20.6	69.3	70.3	69.7	70.3	71.2
Actual	17.8	61.8	62.1	63.7	60.2	61.7
Difference	**-2.8**	**-7.5**	**-8.3**	**-6.0**	**-10.0**	**-9.4**

^ Stub period from 1 January to 31 March 2003

[26] ACCC, Victorian Transmission Network Revenue Caps 2003 - 2008, 11 December 2002.

*Actual to December 2006, forecast to 2007/08

* From 2003/04 to 2007/08 excludes easement tax, glide path for opex and capex, debt and equity raising costs and rebates, from 2007/08 to 2013/14 excludes easement tax, glide path for opex and capex, debt and equity raising costs and rebates, however, it includes SP AusNet's claim for self-insurance.

Source: SP AusNet

Notwithstanding SP AusNet's excellent performance against the regulatory benchmarks for opex in the current period, SP AusNet's original Revenue Proposal identified a number of factors that together will act to increase the efficient operating expenditure requirement in the forthcoming regulatory control period. These factors include:

- the asset failure risks - and the associated increase in maintenance activity - associated with the ageing asset base;
- increased resource requirements associated with compliance with legislation, rules and regulations;
- increasing labour costs created by skilled labour shortages and the current resources boom;
- the increase in prescribed service opex in the forthcoming regulatory period associated with the rolling-in of non-contestable excluded service assets constructed in the current regulatory period; and
- the inclusion of the Company's self-insurance claim (discussed in section 6.8.1).

Each of above factors, other than self-insurance, is discussed briefly in the following sections. These factors remain relevant to SP AusNet's revised Revenue Proposal and the opex forecasts presented in section 6.11.

As noted in section 6.1, information supplementing SP AusNet's original Revenue Proposal in relation to these matters has been provided in section 1.4 of Appendix H.

In relation to material costs, SP AusNet's original Revenue Proposal relied upon the SKM report[27], which models miscellaneous materials to increase in line with CPI. Miscellaneous materials is an appropriate proxy for materials costs as it includes items such as spare parts, equipment etc that are used for opex activities such as maintenance and asset works. The AER considered in the *Powerlink Revenue Cap Draft Decision 2007/08 to 2011/12* that it was appropriate to apply an escalation factor to maintenance materials of CPI.

6.3.1 Asset Failure Risk Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that SP AusNet has a substantial part of its asset base reaching the end its technical life over the forecast period. As noted in Chapter 3, when assets approach the ends of their technical lives performance starts to deteriorate and the probability of complete failure increases. If the problem is not addressed, then substantial increases in total cost may occur due to factors such as increased monitoring and maintenance needs, generation re-scheduling costs and supply interruption costs triggered by asset failures, and additional costs due to the unplanned or premature replacement of failed assets.

The assets work program is preventive in nature and can significantly contribute to reducing total life cycle costs associated with asset failure and increased monitoring and maintenance needs. A project management approach is applied to asset works to ensure effective and efficient delivery of all work.

[27] SKM Report (Appendix C)

6.3.2 Compliance with Legislation, Rules and Regulations Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that SP AusNet is committed to complying with its legislative obligations and implements programs to achieve this. As noted in Section 5.6, SP AusNet is required to comply with significant new health and safety, environmental and security obligations in addition to existing obligations. The asset works program, such as SP AusNet's asbestos removal project and lead contamination project, has focused on addressing specific legislative obligations.

SP AusNet's asbestos removal project aims to comply with the *Occupational Health and Safety (Asbestos) Regulations 2003*. The Regulations endeavours to protect persons against the risk of asbestos-related disease resulting from exposure to airborne asbestos fibres. The project involves the development of the asbestos management strategy to test for and remove asbestos containing material including building cladding, tiles, secondary insulation panels and switchboards.

SP AusNet's lead contamination project aims to comply with the *Environment Protection Act 1970*. The *Act* endeavours to ensure sound environmental practices and procedures are adopted as a basis for ecologically sustainable development. The project involves removing lead based paint and repairing any damage to the galvanising underneath from three towers over the Yarra River on the Fishermen's Bend Terminal Station to West Melbourne Terminal Station.

SP AusNet's original Revenue Proposal explained the proposed asset works program which focuses on addressing occupational health, safety and environmental risks. This information remains relevant to this revised Revenue Proposal and therefore is replicated in Section 6.7.5. It is noted that compliance with these obligations is not a discretionary matter for SP AusNet, so it is important that the revenue cap for the forthcoming regulatory control period contains adequate allowances for all of the capital and operating costs associated with meeting these various obligations.

6.3.3 Labour Cost Increases Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that the impact of competition for skilled resources has lead to increases in labour costs well above CPI. The economic boom in the construction and mining areas has exacerbated strong growth in the demand for skilled labour.

SP AusNet is forced to seek staff from a limited pool with the appropriate skill set. The average age of the technical workforce is 48 years, with a projected loss of 22 percent of the current workforce over the next five years. In light of the diminishing pool of suitably qualified employees the industry has to draw on, and the transition to retirement of a significant proportion of its workforce, SP AusNet and other infrastructure businesses has had to offer increasingly competitive salaries to attract further numbers of employees into the industry.

There have been a significant amount of consultant studies done on the shortages of labour in the energy sector driving wage growth substantially beyond CPI. These consultancies have concluded different future labour escalation factors for the energy sector; however, all have acknowledged the impact of shortages of skilled resources and competition on increased labour costs. These factors remain relevant to SP AusNet's revised Revenue Proposal and the opex forecasts presented in section 6.11.

SP AusNet's original Revenue Proposal noted that in the recent Access Economics Report[28] commissioned by the AER and relied upon it in the *Powerlink Revenue Cap Draft Decision 2007/08 to 2011/12*, Access Economics stated:

[28] Access Economics Pty Limited, Wage growth forecasts in the utilities sector, November 2006, page i.

> "… after remaining close to the expected "long-term" rate of 4¼% until 2003-04, wage growth in the utilities sector has leapt sharply in the past few years, even as productivity levels have reversed … wages growth in the first few years [from 2005/06] is likely to remain relatively strong due to the current skills shortages prevalent in the utilities sector. These shortages are not caused solely by growth in the sector itself, but have flowed from the strength in other sectors - notably construction - in recent years and a similar shortage in the mining sector."

However, Access Economics though recognising the demand pressures will drive wages growth well above longer-term averages for the 2006 / 07, 2007 / 08 and 2008 / 09 financial years, they considered that wages would moderate significantly thereafter.

SP AusNet's original Revenue Proposal explained that SP AusNet does not believe the longer term elements of these forecasts are credible, implying as they do, that the skills shortages currently being experienced within the utilities sector will resolve themselves in the space of the next two years and to such an extent that wages growth in the longer term will actually fall, not only below historical averages, but also below wage inflation in the broader economy. This trend is not in line with SP AusNet's experience. As noted the combination of strong employment growth in the utilities industry and competition for like-skilled employees from other sectors of the economy, notably mining and construction, will make it difficult for the energy industry to attract and retain workers without remuneration at least keeping pace with aggregate wages growth.

In contrast the recent BIS Shrapnel report[29] commissioned by SP AusNet, Envestra and MulitNet Gas, concluded:

> "…the anticipated growth in the wage cost index (WCI) for the electricity, gas, water sector will average over 0.8 percent higher than the national WCI growth of 4.0 percent per annum over the seven years to 2012/13. The faster wages growth expected in the electricity, gas and water sector over the next six years in line with historical movements over the past 15 years".

SP AusNet's original Revenue Proposal explained that BIS Shrapnel's wage growth index for the electricity industry in Victoria indicated that on average the forecast wage growth index is 2.83 percent per annum above CPI.[30]

SP AusNet explained that BIS Shrapnel's forecasts are far more realistic given the recent historical movements over the last 15 years and further are in line with SP AusNet's experience and expectations. SP AusNet's original Revenue Proposal therefore adopted a 2.83 percent per annum above CPI labour cost escalator.

6.3.4 Increase in Prescribed Service Operating Expenditure Submitted by SP AusNet in its Original Revenue Proposal

In its 2002 Revenue Cap Application, SP AusNet outlined its proposal for treatment of assets associated with providing non-contestable services that are initially outside the revenue cap (under the Victorian Regulatory Arrangements) for the new regulatory period commencing 1 April 2008. Details regarding the rolling into the prescribed service asset base of previously excluded assets are set out in Section 7.4.

[29] BIS Shrapnel Report (Appendix F)
[30] ibid

This roll-in of assets is protected as a transitional arrangement under Clause 11.6.21 of the NER. Therefore, SP AusNet has rolled-in assets associated with the provision of non-contestable services that were commissioned since the cut off date for the previous review.

The major additions will be the non-contestable network and connection works such as interface and connection works at the Cranbourne Terminal Station and non-contestable work on the Snowy Interconnector Upgrade.

SP AusNet's original Revenue Proposal noted that the value of those assets that SP AusNet is rolling into the RAB on 1 April 2008 is $2,222.9 million. SP AusNet also noted that the impact on the operating and expenditure requirements is 1.03 percent.

SP AusNet explained that the roll-in of the non-contestable projects and connection works will not always increase in a one-for-one increase in opex. This is due to a number of factors such as the existence of economies of scale and different maintenance and replacement requirements for pieces of equipment.

6.4 Operating Expenditure Forecasting Methodology and Assumptions Submitted by SP AusNet in its Original Revenue Proposal

In accordance with Schedule 6A.1.2 of the NER, SP AusNet's original Revenue Proposal explained the methodology used for developing the opex forecast, and the key assumptions that underlie the forecasts. As noted in section 6.1, information supplementing SP AusNet's original Revenue Proposal in relation to this matter has been provided in section 1.4 of Appendix H.

In broad terms, the opex forecasts presented in SP AusNet's original Revenue Proposal are consistent with the implementation and efficient execution of SP AusNet's Asset Management Strategy, and the capital expenditure program described in Chapter 5. A detailed description of SP AusNet's Asset Management Strategy is provided in Chapter 3 of this submission.

In forecasting opex, SP AusNet's original Revenue Proposal explained that it distinguishes between recurrent and non-recurrent expenditure. For recurrent expenditure, such as routine maintenance and operations and corporate costs, it is possible to apply cost escalation factors to a base year.

It is important that the base year is appropriately scoped so that new functions or activities (perhaps as a result of changes to compliance obligations or service standards) are taken into consideration. SP AusNet's original Revenue Proposal forecasted the opex for recurrent expenditure for 2008 equal to the 2006 actual recurrent expenditure and taken into account the impact of increased labour costs, forecast to grow by 2.83 percent[31] per annum above CPI respectively.

SP AusNet's original Revenue Proposal explained that non-recurrent expenditure is forecast on a program basis, which reflects specific drivers such as asset failure risk and compliance with legislation, rules and regulations, or challenges that must be addressed in the forthcoming regulatory control period.

The key areas of focus for the asset works program for the current regulatory control period have been:

- Tower painting program;
- Corrosion mitigation investigations on towers;
- Refurbishment of SF_6 Breakers;
- Repair of 500 kV GIS Switchgear; and

[31] ibid

- Initial work in relation to major flaws in the joints of the Brunswick to Richmond 220 kV cable.

SP AusNet's original Revenue Proposal explained that given the complex nature of the asset management processes, it is not practical to present a full list of assumptions that underlie the opex forecasts. In broad terms, however, the principal assumptions and considerations underpinning the opex forecast in SP AusNet's original Revenue Proposal relate to:

- the detailed assessment of cost drivers in the forthcoming regulatory control period and beyond;
- the factors affecting future opex (as discussed in Section 6.3); and
- the availability of suitably skilled internal and external resources.
- These factors remain relevant to SP AusNet's revised Revenue Proposal and the opex forecasts presented in section 6.11.

6.5 Routine Maintenance and Operations Submitted by SP AusNet in its Original Revenue Proposal

6.5.1 Overview of Historic and Forecast Operating Expenditure Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal presented an overview of SP AusNet's historic and forecast routine maintenance opex as set out in Table 6.5.1 and Figure 6.5.2. SP AusNet noted that it has made substantial savings during the current regulatory period, with routine maintenance costs averaging 24.5 percent below the AER benchmark.

SP AusNet's original Revenue Proposal noted that SP AusNet's operating expenditure on routine maintenance works is expected to increase by an average of 2.79 percent. Despite the impact of increased labour costs, forecast to grow by 2.83 percent[32] per annum above CPI respectively, SP AusNet explained that it plans to contain expenditure on routine maintenance costs over the 2008 to 2013 / 14 period.

SP AusNet has achieved its excellent performance through changed work practices and investment in improved systems as outlined in Section 6.5.2 and the merger of the transmission and distribution businesses. The merger of the businesses has achieved cost savings for example through the increase in condition monitoring which has allowed for more targeted maintenance activities and the integration of the distribution and transmission operating centres.

Table 6.5.1 Routine Maintenance Costs 2003/04 to 2013/14 (real 2007/08 $m) Submitted by SP AusNet in its Original Revenue Proposal

	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08*	2008/09*	2009/10	2010/11	2011/12	2012/13	2013/14
Maintenance	4.6	19.7	19.2	17.8	17.4	17.7	18.1	18.4	18.8	19.2	19.6	19.9
System operation	0.9	3.9	3.9	3.5	2.5	2.6	2.7	2.7	2.8	2.9	2.9	3.0
OHS	0.3	1.0	0.9	0.9	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Support	1.0	3.1	3.8	6.1	4.7	4.8	4.9	5.1	5.2	5.3	5.4	5.5
Total	**6.9**	**27.6**	**27.8**	**28.2**	**25.2**	**25.7**	**26.3**	**26.8**	**27.4**	**27.9**	**28.5**	**29.1**
Benchmark	9.8	34.6	35.7	35.3	35.7	36.3	n/a	n/a	n/a	n/a	n/a	n/a
Difference	**-2.9**	**-7.0**	**-7.9**	**-7.1**	**-10.5**	**-10.6**						

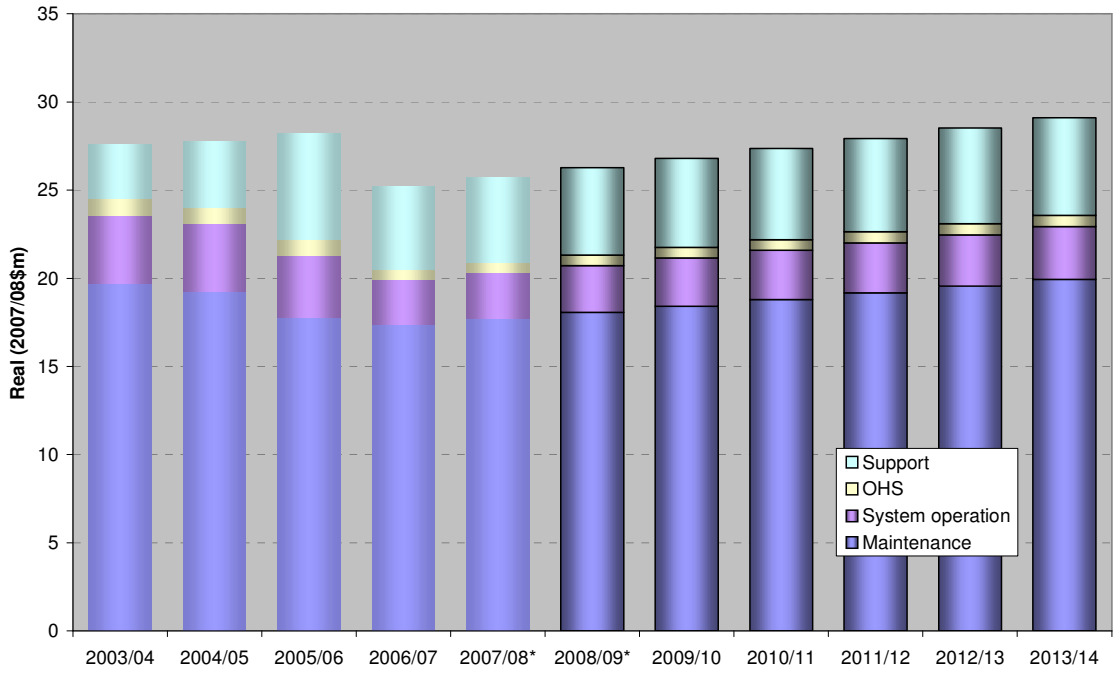
[32] ibid

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

* Actual to December 2006, forecast to 2013/14.

Source: SP AusNet

Figure 6.5.2 Routine Maintenance Costs 2003/04 to 2013/14 (real 2007/08 $m) Submitted by SP AusNet in its Original Revenue Proposal



* Actual to December 2006, forecast to 2013/14

Source: SP AusNet

6.5.2 Explanation of Variations between Historic and Forecast Operating Expenditure as Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that during the current regulatory control period, maintenance costs specifically have averaged 26.9 percent below the AER benchmark. These substantial savings have been generated through changed work practices and investment in improved systems, in particular:

- increased condition monitoring has allowed more targeted maintenance activities;
- improved asset management systems and processes have allowed better integration of the capex and opex programs;
- internal benchmarking has facilitated the implementation of work practice improvements in each maintenance area; and
- use of outsourced maintenance has helped to spur efficiency improvements in other internally resourced maintenance areas.

SP AusNet noted that the cost of system operations has averaged 17.5 percent below the AER benchmark over the current regulatory period. Savings have been generated from the integration of the distribution and transmission operating centres.

SP AusNet's original Revenue Proposal explained that expenditure on routine maintenance requirements is likely to be stable over the review period. Although the base maintenance program has been fairly stable, the increased complexity of the work and the increase in non-recurrent works (condition assessments, performance assessments and monitoring) has lead to increased use of office-based personnel and increased use of contractors in support roles.

These observations remain relevant to SP AusNet's revised Revenue Proposal and the opex forecasts presented in section 6.11.

Other system routine maintenance requirements include both insurance and taxes. SP AusNet's original Revenue Proposal explained that insurance costs have averaged 6.5 percent above the AER benchmark largely due to a tightening insurance market at the start of the period. Table 6.5.2 provides an overview of SP AusNet's other system routine maintenance costs as presented in SP AusNet's original Revenue Proposal.

Table 6.5.2 Insurance and Taxes 2003/04 to 2013/14 (real 2007/08 $m) Submitted by SP AusNet in its Original Revenue Proposal

	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08*	2008/09*	2009/10	2010/11	2011/12	2012/13	2013/14
Taxes	0.8	4.4	3.7	4.2	4.4	4.4	3.7	3.9	4.0	4.2	4.3	4.5
Benchmark	1.1	4.9	4.9	4.9	4.8	4.9						
Difference	**-0.3**	**-0.5**	**-1.2**	**-0.6**	**-0.4**	**-0.4**						
Insurance	0.7	2.9	3.0	2.8	2.9	2.9	2.9	3.2	3.4	3.5	3.5	3.5
Benchmark	0.6	2.7	2.7	2.7	2.7	2.7	n/a	n/a	n/a	n/a	n/a	n/a
Difference	**0.1**	**0.2**	**0.2**	**0.1**	**0.2**	**0.2**						

Source: SP AusNet

6.6 Corporate Costs Submitted by SP AusNet in its Original Revenue Proposal

6.6.1 Overview of Historic and Forecast Operating Expenditure Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal provided an overview of SP AusNet's historic and forecast corporate costs as set out in Table 6.6.1 and Figure 6.6.2. As noted in section 6.1, information supplementing SP AusNet's original Revenue Proposal in relation to this matter has been provided in section 1.4 of Appendix H.

SP AusNet's original Revenue Proposal noted that its current corporate costs have averaged 24 percent above the AER benchmark. It also explained that the merger of the SPI PowerNet (transmission) business and the TXU (distribution) business has resulted in a reallocation of costs and focus for which no allowance was made. In particular, the management fees, which were internalised for each specific business, SPI PowerNet and TXU, have now been reallocated across the merged SP AusNet business in line with management effort. SP AusNet's original Revenue Proposal noted in particular that these costs are not additional costs to the SP AusNet business as a whole, but just a reallocation of cost. However, given the reallocation of management fees across the whole business, both distribution and transmission, corporate costs for transmission has increased.

The key driver of the expected increase in corporate costs over the period 2008 to 2013 / 14 is the impact of increased labour costs, forecast to grow by 2.83 percent[33] per annum above CPI respectively. This issue therefore remains relevant to SP AusNet's revised Revenue Proposal and the opex forecasts presented in section 6.11.

[33] ibid

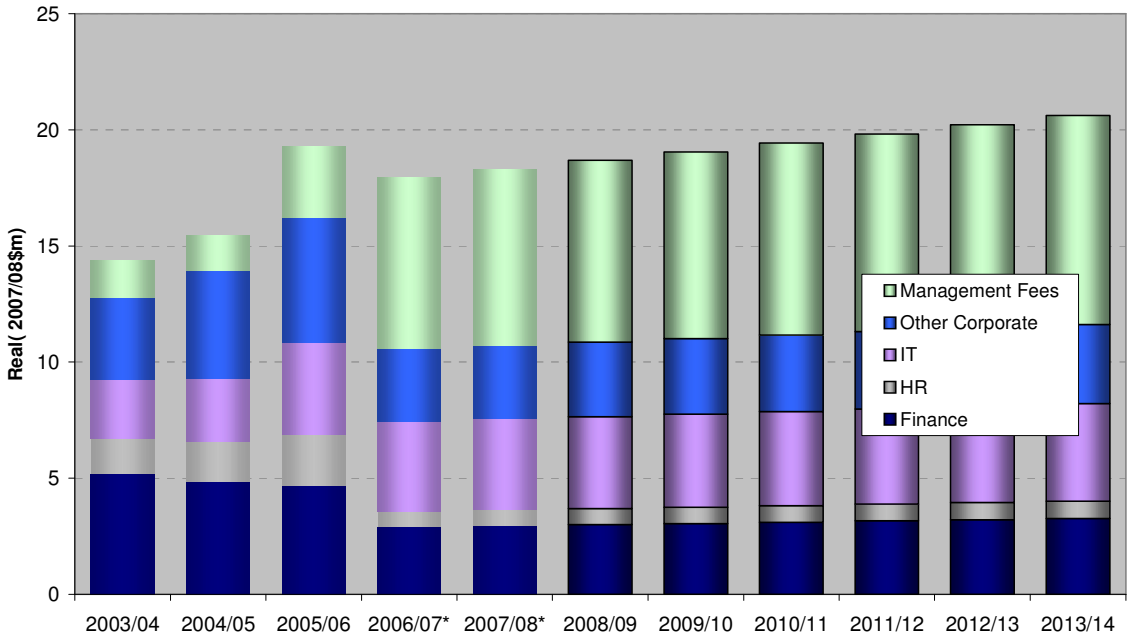
Table 6.6.1: Corporate Opex Costs 2003/04 to 2013/14 (2007/08 $m) Submitted by SP AusNet in its Original Revenue Proposal

	2002/03	2003/04	2004/05	2005/06	2006/07*	2007/08*	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Finance	2.0	5.2	4.9	4.7	2.9	2.9	3.0	3.1	3.1	3.2	3.2	3.3
HR	0.4	1.5	1.7	2.2	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
IT	0.8	2.6	2.7	3.9	3.9	3.9	4.0	4.0	4.1	4.1	4.1	4.2
Other Corporate	0.9	3.5	4.7	5.4	3.1	3.2	3.2	3.2	3.3	3.3	3.4	3.4
Management fees	0.0	1.6	1.5	3.1	7.4	7.6	7.8	8.0	8.3	8.5	8.7	9.0
Total	**4.1**	**14.4**	**15.5**	**19.3**	**18.0**	**18.3**	**18.7**	**19.0**	**19.4**	**19.8**	**20.2**	**20.6**
Benchmark	3.7	13.7	13.5	13.6	13.8	13.9	n/a	n/a	n/a	n/a	n/a	n/a
Difference	**0.4**	**0.7**	**1.9**	**5.7**	**4.2**	**4.4**						

* Actual to December 2006, forecast to 2013/14

Source: SP AusNet

Figure 6.6.2: Corporate expenditure 2003/04 to 2013/2014 (average 2007/08 $m) Submitted by SP AusNet in its Original Revenue Proposal



* Actual to December 2006, forecast to 2013/14

Source: SP AusNet

6.6.2 Explanation of Variations between Historic and Forecast Operating Expenditure Submitted by SP AusNet in its Original Revenue Proposal

As noted, the merger of the business has resulted in a reallocation of management fees, which was not accounted for in the allowance and has been the key driver for the increase in corporate costs. The current corporate costs have averaged 24 percent above the AER benchmark.

In addition to management fees, SP AusNet's original Revenue Proposal explained that Information Technology (IT) costs increased from 2005 / 06 onwards due to the IT separation of the merchant energy business and the establishment of systems for the newly merged business. Further, with the establishment of new systems, training needs for the IT technicians

and support engineers have increased in order to ensure they keep abreast of the latest technologies and the hardware they operate on. Although IT costs have increased, the benefits of those new systems have flowed through into the costs of other areas of the business, such as maintenance and assets works, helping maintain lower overall costs.

SP AusNet's original Revenue Proposal further explained that Human Resources (HR) costs increased in the financial year 2005 / 06, but decreased in the subsequent years, reflecting the increased HR activity associated with the creation of the merged entity. During the current regulatory control period, HR costs averaged 25.9 percent below the AER benchmark.

Despite the upward pressures on operating and maintenance expenditure, SP AusNet's original Revenue Proposal explained that SP AusNet will contain expenditure on corporate costs over the 2008 to 2013 / 14 period. This goal remains relevant to SP AusNet's revised Revenue Proposal and the opex forecasts presented in section 6.11.

As noted in section 6.1, information supplementing SP AusNet's original Revenue Proposal in relation to this matter has been provided in section 1.4 of Appendix H.

6.7 Asset Works Submitted by SP AusNet in its Original Revenue Proposal

6.7.1 Overview of Historic and Forecast Operating Expenditure Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal provided an overview of SP AusNet's historic and forecast non-recurrent system costs as set out in Table 6.7.1 and Figure 6.7.2. The proposal explained that asset works expenditure is not recurrent and therefore it is not appropriate to derive forecasts of future requirements from previous expenditure.

The future asset works program is designed to respond to new priorities and problems, which vary from the previous regulatory period. SP AusNet's original Revenue Proposal explained that the increasing number and complexity of asset works has resulted in the need to hire technical specialists from time to time to support the core of SP AusNet's engineers and technical staff.

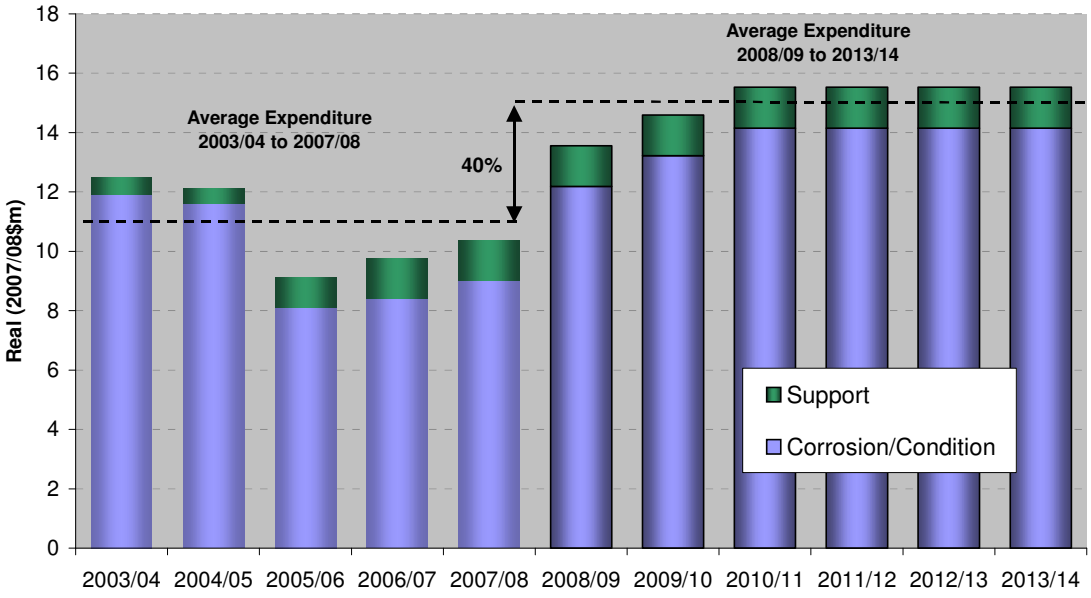
Table 6.7.1: Asset work costs 2003/04 to 2013/14 (2007/08 $m) Submitted by SP AusNet in its Original Revenue Proposal

	2002/03	2003/04	2004/05	2005/06	2006/07*	2007/08*	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Corrosion/Condition	4.8	11.9	11.6	8.1	8.4	9.0	12.2	13.2	14.1	14.1	14.1	14.1
Support	0.5	0.6	0.5	1.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Total	**5.3**	**12.5**	**12.1**	**9.1**	**9.8**	**10.4**	**13.6**	**14.6**	**15.5**	**15.5**	**15.5**	**15.5**
Benchmark	5.4	13.7	13.5	13.6	13.8	13.9	n/a	n/a	n/a	n/a	n/a	n/a
Difference	**-0.1**	**-1.2**	**-1.4**	**-4.5**	**-4.0**	**-3.5**						

* Actual to December 2006, forecast to 2013/14

Source: SP AusNet

Figure 6.7.1 Asset works expenditure 2003/04 to 2013/14 (average 2007/08 $m) Submitted by SP AusNet in its Original Revenue Proposal



*Actual to December 2006, forecast to 2013/14

Source: SP AusNet

6.7.2 Explanation of Variations between Historic and Forecast Operating Expenditure Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that asset works costs have averaged 18 percent below the AER benchmark during the current regulatory period. This variation reflects the new priorities and problems that have arisen during the current period.

The key drivers for the increase in asset works costs over the forthcoming regulatory control period include the assessed levels of asset failure risk and increased resource requirements for compliance with legislation, rules and regulations. The asset works program addresses health, safety and environmental obligations, which includes asbestos removal and switchyard resurfacing. As noted earlier, the asset works program is non-recurrent and therefore it is not appropriate to base forecasts of future requirements on previous expenditure levels.

SP AusNet's original Revenue Proposal explained that the key areas of focus for the asset works program between 2008 / 09 and 2013 / 14 are:

- Repair and prevention of tower corrosion;
- Significant repair or refurbishment projects to mitigate asset failure risk;
- Reduction in OH&S and environmental risk; and
- Condition monitoring.

Examples of projects are discussed in more detail in the following sections. The examples substantially replicate the information provided in SP AusNet's original Revenue Proposal as they continue to be relevant to SP AusNet's revised opex forecasts presented in section 6.11.

6.7.3 Tower Corrosion Programs Submitted by SP AusNet in its Original Revenue Proposal

As the transmission lines reach 50 years of age corrosion problems especially are beginning to become clearly evident. An opex solution to this problem is still a far cheaper option than

replacement in this case, as with appropriate maintenance towers can last 70 years or more. The intensive investigative program carried out during the previous regulatory period under the asset works program supports the works outlined below, which replicates the information submitted in SP AusNet's original Revenue Proposal.

Tower Foundation Corrosion	A significant proportion (about 30%) of all SP AusNet's transmission line towers have foundations where the steel is not totally encased in concrete to above ground level and hence have some direct buried steel. Direct buried steel can suffer significant corrosion problems when exposed to aggressive soil or electrolysis effects. The life expectancy of such below-ground steelwork is a function of the performance and extent of the coating system, the aggressiveness of the soil conditions and the presence of stray ground currents. Some early paint-coating systems are at the end of their life and new replacement systems are being implemented. The major concern is loss of galvanising and steel in the below-ground steelwork, which could lead to structural failure. In some cases foundation replacement is required. A recent program of targeted excavation of 23 foundations (within terminal stations) at risk (from acidic soil) resulted in the need for replacement and/or structural repair to four of them, while all such towers suffered some degree of corrosion of buried or ground level steel. Foundations not in need of replacement may need to be protected from further deterioration by the installation of Cathodic Protection (CP) or Impressed Current Cathodic Protection (ICCP) and electrically separated from the station earth grid (as required). SP AusNet's original Revenue Proposal noted that total expenditure of **$4.2 million** is necessary over the next regulatory period.
Tower Ground Level Corrosion	Investigations have indicated the need for ongoing corrosion repairs to ground level steel on a significant number of towers per year. About 30% of SP AusNet's towers have some direct buried steel. A high proportion of fully concreted foundations are also exposed to soil at surface level. Soil build-up or moisture ingress leads to corrosion and metal loss in ground-line steelwork. Treatment often involves structural reinforcement and the application of protective coatings. SP AusNet's original Revenue Proposal noted that total expenditure of **$8.2 million** is necessary over the next regulatory period.
Tower Painting	Towers and rack structures in coastal areas, or near industrial pollution, experience rust of above ground members. This is a continuation of the significant program of painting over the last five years. SP AusNet's original Revenue Proposal noted that total expenditure of **$4.8 million** is necessary over the next regulatory period.

Tower Bolt Replacement	Many towers located in harsh environments suffer rusting of individual nuts and bolts and tower members. This program is required to replace or patch paint badly degraded nuts and bolts to ensure the on-going structural integrity of the tower. SP AusNet's original Revenue Proposal noted that total expenditure of **$0.6 million** is necessary over the next regulatory period.

6.7.4 Major Asset Repair or Refurbishment Programs Submitted by SP AusNet in its Original Revenue Proposal

These projects cover major repairs or refits that are necessary to ensure equipment continues to perform reliably until the end of its technical life. As these programs do not extend the technical life of the assets, this expenditure cannot be treated as capex. The following table replicates the information submitted by SP AusNet in its original Revenue Proposal.

Replacement of Tower Steelwork	Replacement of members damaged due to corrosion or impact caused by vehicles or farm machinery. In harsh environments, the corrosion of tower members occurs. This is not a widespread problem, in terms of the numbers of towers, but nevertheless it can incur a significant cost because of the difficulties involved in replacing structural components on loaded towers. SP AusNet's original Revenue Proposal noted that total expenditure of **$1.2 million** is necessary over the next regulatory period.
Replacement of Transmission Line Hardware	This includes replacement of conductors, ground-wire, insulators and termination fittings and line hardware sampling, investigation and repair work. The dampers and spacers for conductors and ground-wires, and suspension and termination assemblies, comprise a variety of forged and cast components in galvanised steel, cast iron and aluminium alloys. These items wear and corrode at connection points and can fatigue due to cyclic loading. Deterioration can sometimes be related to age or type, but is often site specific because of loading or wind conditions. Spacers and dampers, designed to protect conductors and ground-wire, can damage them if attachment clamps become loose. Failure of transmission line hardware can result in a dropped conductor. SP AusNet's original Revenue Proposal noted that total expenditure of **$1.8 million** is necessary over the next regulatory period.

SF_6 Circuit Breaker Refurbishments	Major refurbishment works are required on various SF_6 circuit breakers to improve their reliability. SF_6 CBs have suffered from SF_6 leaks caused by flange corrosion, hardening of seals, interrupter design problems and hydraulic mechanism problems including oil leaks, entrained gas, and trapped metal particle problems. Also, accumulators have suffered nitrogen losses. Corrosion has proven worse than anticipated and SF_6 leaks are the most common cause of SF_6 CB system incidents, followed by hydraulic drive problems. Early SF_6 CBs were purchased with the knowledge that a 'half life' refurbishment would be necessary. This work is essentially a full strip-down with all seals replaced. SP AusNet's original Revenue Proposal noted that total expenditure of **$10.1 million** is necessary over the next regulatory period.
Gas Insulated Switchgear Refurbishment	The number of major failures on the older outdoor GIS has dramatically increased in recent years. For example, at South Morang Terminal Station (SMTS) between 2003 and 2004, there were two major mechanical interrupter failures of circuit breakers and one power flashover of the 500 kV GIS. In addition to major failures, there has been an increase in the number of ongoing defects resulting from SF_6 leaks (caused by corrosion and design problems), hydraulic mechanism leaks and failure of isolators and earth switches to operate correctly. Increased focus on condition monitoring of the 500 kV GIS at SMTS and Sydenham Terminal Station (SYTS), through real-time digital x-ray imaging technology and UHF partial discharge monitoring, has identified further mechanical and electrical defects. Intrusive corrective action was undertaken in 2004 on the serious defects but there still remain defects to be corrected in future refurbishment work. The following major programs need to be continued to ensure the GIS will reach its economic life and to reduce the SF_6 leak rate. The program includes: ▪ silastic injection and corrosion repair of flanges of 500 kV GIS at SMTS; ▪ condition initiated remedial works on the 500 kV GIS at SMTS; ▪ refurbishment of hydraulic mechanisms of the 500 kV GIS circuit breakers at SMTS and SYTS; ▪ regular PD monitoring and investigations of the GIS at SMTS, SYTS, Newport Power Station (NPSD), West Melbourne Terminal Station (WMTS) and Rowville Terminal Station (ROTS); ▪ x-ray and NDT condition inspections of the GIS at SMTS, SMTS, NPSD and WMTS; and ▪ Gas leak repairs on the 220 kV GIS at NPSD. SP AusNet's original Revenue Proposal noted that total expenditure of **$5.2 million** is necessary over the next regulatory period.

Power Cable Repairs	Major repairs are required on the Brunswick Terminal Station – Richmond Terminal Station Line 220 kV Cable as water is entering the cable joints, leading to low sheath insulation resistance. Cable joint entry oil seals are also leaking. The cable has three cable joints in each of 13 joint bays. One joint failed in 2006 causing a major outage. Three joints have been replaced during the current period. It is proposed that six joints are replaced per year over the forthcoming 6-year regulatory period. SP AusNet's original Revenue Proposal noted that total expenditure of **$7.0 million** is necessary over the next regulatory period.
Power and Instrument Transformer Repairs	An allowance is needed for the on line monitoring and off line testing of transformers. The allowance would include the costs of urgent replacement of failed units and replacement of On Load Tap Changer (OLTC) components. Regular dissolved gas analysis of oil samples from oil filled transformers is a primary tool for condition assessment. This analysis provides a reasonable assessment of insulation condition and permits the planned removal of units that have deteriorated beyond acceptable limits. Monitoring has shown that the degradation rate can be slow in many cases but also accelerate as the unit approaches failure. The requirement to replace OLTC components is the result of manufacturer's advice following a problem identified with an SP AusNet transformer. SP AusNet's original Revenue Proposal noted that total expenditure of **$2.3 million** is forecast over the next regulatory period.

6.7.5 Occupational Health & Safety Risk and Environmental Risk Submitted by SP AusNet in its Original Revenue Proposal

As noted in section 6.3.2 the asset works program has focused on ensuring compliance with our legislative obligations. The following table replicates the information submitted by SP AusNet in its original Revenue Proposal.

Asbestos Removal	An audit of all terminal stations, field depots, and communications sites was carried out in 2004 and an asbestos register established. From this an asbestos management strategy has been developed to test for and remove asbestos containing material including building cladding, tiles, secondary insulation panels and switchboards. This program has been integrated with the refurbishment program where applicable. SP AusNet's original Revenue Proposal noted that total expenditure of **$2.7 million** is necessary over the next regulatory period.
Switchyard Resurfacing	The switchyard surface material forms an integral part of the design of the earth grid, which protects personnel from electrocution at a terminal station. Surface stability is also important for pedestrian, vehicle and mobile plant traffic, allowing safe access for work on the electrical assets. A number of surfaces have deteriorated or have inappropriate switchyard surface material and need renewing. SP AusNet's original Revenue Proposal noted that total expenditure of **$2.5 million** is necessary over the next regulatory period.

Lead contamination	Three towers over the Yarra River on the Fishermen's Bend Terminal Station (FBTS) to West Melbourne Terminal Station (WMTS) 220 kV Lines (next to the Bolte Bridge) were painted red and white with lead based paint over 30 years ago, to aid aircraft navigation. Work to remove the lead based paint, and repair any damage to the galvanising underneath, will be completed during the current period. However, recent soil samples have revealed an elevated level of lead in the surrounding soil in the proximity of waterways, including the Yarra River. SP AusNet will complete remediation of the surrounding soil during the forthcoming period. SP AusNet's original Revenue Proposal noted that total expenditure will be **$0.5 million** in 2008 / 09.
Transformer Leaks Repairs and Oil Treatment	This includes major oil leak repairs and replacement/reclamation of aged and contaminated oil. Oil leaks from transformer tanks, coolers, pipe work, valves and other fittings is one of the most widespread problems with oil-filled power transformers. Apart from the environmental problem caused by oil leaking from a transformer, oil on the tank surface increases the risk of a fire. The oxidation or degradation of oil with time, particularly with free-breathing oil preservation systems, produces compounds which accelerate the ageing process of solid insulation, particularly at elevated temperatures. With increased utilisation and operation at higher loads, it is likely that in future it will be necessary to carry out replacement or treatment of the oil on more 'free-breathing' transformers. Consideration also needs to be given to the replacement of insulating oil containing non-scheduled poly chlorinated biphenyls (PCBs) prior to planned work involving processing of the oil. SP AusNet's original Revenue Proposal noted that total expenditure of **$4.3 million** is necessary over the next regulatory period.

6.7.6 Condition Monitoring Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet is embarking on a major program to develop a knowledge-based asset management system that utilises both on-line and off-line condition monitoring data. This expenditure is required to investigate, adopt and implement new condition monitoring technologies.

SP AusNet's original Revenue Proposal noted that total expenditure of **$1.0 million** is necessary over the next regulatory period.

6.8 Other Costs Submitted by SP AusNet in its Original Revenue Proposal

6.8.1 Self-insured Risks and Deductibles Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that there are a number of risks borne by SP AusNet in the conduct of its regulated business which are not compensated through WACC or otherwise, and which cannot be insured cost-effectively. The business bears and manage these risks, and must therefore be compensated for them.

In preparing its original Revenue Proposal, SP AusNet engaged SAHA Consulting to update and reassess the risks outlined in the Trowbridge Consulting *Valuation of Non-insured Risks*

report that formed the basis of the self-insurance allowance in the 2002 Decision. SP AusNet provided the SAHA report to the AER on a confidential basis.

In addition to these costs, SAHA Consulting has also assessed the expected value of deductibles over the upcoming regulatory period. SP AusNet's original Revenue Proposal explained that the current Revenue Cap Decision allows deductibles paid as a result of an insurance event to be claimed via a pass-through mechanism rather than the expected annual cost incurred to be included as an opex allowance. However, deductibles are no longer pass-through events due to the new materiality threshold for pass-through events established in the NER.

SP AusNet's original Revenue Proposal noted that the expected annual cost of deductibles has also been included in the opex forecasts. The self-insured and deductible costs included in SP AusNet's original Revenue Proposal are shown in Table 6.8.1.

Table 6.8.1 Non-insured risks (2007/08 $m) Submitted by SP AusNet in its Original Revenue Proposal

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Non insured risks	2.54	2.54	2.54	2.54	2.54	2.54

Source: SP AusNet

As noted in section 6.1, information supplementing SP AusNet's original Revenue Proposal in relation to this matter has been provided in section 1.10 of Appendix H.

6.8.2 Equity Raising Costs Submitted by SP AusNet in its Original Revenue Proposal

The ACCC recognised that some entities have to incur costs when raising equity[34]:

> "These include payments for services such as financial structuring, marketing, preparing and distributing information, and undertaking presentations to prospective investors and underwriting".

On the basis of the reasoning set out in its NSW and ACT transmission revenue cap decision for 2004/05-2008/09, the ACCC included an allowance for equity raising costs in its 2002 *Decision on Victorian Transmission Network Revenue Caps 2003 - 2008*. The ACCC considered that an average of recent equity raising costs of 0.215 percent per annum for Australian infrastructure equity issues, amortised in perpetuity, was an appropriate Australian benchmark for the purpose of its decision.

SP AusNet's original Revenue Proposal explained that equity raising costs were calculated as 0.215 percent of the benchmark equity share (40 percent) of the opening RAB value for each year of the proposed regulatory period. SP AusNet noted that this calculation continues the precedent established in the regulator's previous Decision.

The equity raising costs included in SP AusNet's original Revenue Proposal are shown in Table 6.8.2.

Table 6.8.2 Equity Raising Costs (2007/08 $m) Submitted by SP AusNet in its Original Revenue Proposal

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Equity raising costs	1.9	1.9	2.0	2.0	2.0	2.0

[34] The NSW and ACT Transmission Network Revenue Caps – TransGrid 2004/05-2008/09: Draft Decision, page 83

Source: SP AusNet

6.8.3 Debt Raising Costs Submitted by SP AusNet in its Original Revenue Proposal

Transactions costs incurred raising debt to fund the provision of regulated electricity transmission services are a necessary and legitimate expense for which the distribution business should be compensated. These costs are incurred on an ongoing basis as businesses continually roll over their stock of debt. Provision of an allowance for these expenses in the cost of debt is firmly established in regulatory decision-making.

Debt raising costs were approved in the 2002 ACCC *Decision on Victorian Transmission Network Revenue Caps 2003 - 2008*. Equity raising costs were included as a cash flow in the regulated opex, whereas debt-raising costs were allowed as an additional margin in the debt component of the WACC calculation. More recent regulatory decisions have included both as cash flows in the opex; therefore, SP AusNet has followed this convention.

Debt raising costs have been calculated as 0.125 percent of the benchmark debt share (60 percent) of the opening RAB value for each year of the proposed regulatory period. This aligns with the latest precedent set in the 2005 *ESC Victorian Electricity Distribution Price Review Final Decision* and the emerging 'regulatory norm' illustrated in Table 6.8.3.

Table 6.8.3: Electricity distribution regulatory precedent

Regulator	Date	Decision status	Network type	Debt transaction costs
ICRC	March 2004	Final decision	Electricity distribution	12.5bps
IPART	June 2004	Final decision	Electricity distribution	12.5bps
ESCOSA	April 2005	Final decision	Electricity distribution	12.5bps
QCA	April 2005	Final decision	Electricity distribution	12.5bps
ESC	October 2005	Final decision	Electricity distribution	12.5bps

The AER currently relies on an Allen Consulting Group Report prepared for the ACCC in 2004[35]. This recommends an allowance of 8 basis points be used for debt raising costs – excluding an allowance for the dealer swap margin of 5 basis points.

More recently however, Allen Consulting Group has recommended that an allowance of 12.5 basis points be provided for the debt raising costs of the Queensland gas distribution businesses[36].

> ACG also recommends that an allowance of 12.5 basis points be provided for debt raising costs. The cost of raising debt is a necessary cost of providing the regulated services, and hence appropriately included in the revenue caps for the regulated entities. We note that 12.5 basis points exceeds the amount suggested by ACG in a recent detailed study. The difference, however, is marginal and an allowance of 12.5 basis points provides for regulatory consistency and errs on the side of conservatism.

Furthermore, SP AusNet believes that excluding the allowance for the dealer swap margin is not consistent with the ACCC Final Decision on GasNet *Access Arrangements for the Principal Transmission System* or the associated Appeal Decision of the Australian Competition Tribunal, which included this margin.

35 Allen Consulting Group, Debt and Equity Raising Transaction Costs, Final Report, December 2004.
36 Op. Cit., Allen Consulting Group, Memorandum on Cost of Debt Margin, July 2005 page 38.

The debt raising costs are included in SP AusNet's original Revenue Proposal are shown in Table 6.8.4.

Table 6.8.4: Debt Raising Costs (2007/08 $m) Submitted by SP AusNet in its Original Revenue Proposal

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Debt raising costs	1.7	1.7	1.7	1.7	1.7	1.8

Source: SP AusNet

6.9 Easement Land Tax Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that in 2004, the Victorian Government extended land tax to electricity transmission easements owned by electricity transmission companies in Victoria. The new tax arrangement was designed to counter a shortfall in Government revenue as a result of the Government's abolition of the Smelter Reduction Amount levy. At the time, the Victorian Government made a commitment that SP AusNet would not incur any financial loss as a result of the introduction of this new tax and any future changes to it.

SP AusNet noted that this very significant new impost was not provided for in the current regulated revenue cap. Therefore, SP AusNet applies annually for a pass-through of the financial effect associated with this new tax under its current Pass Through Rules described in Section 5.7.5 of the 2002 *ACCC Decision on Victorian Transmission Network Revenue Caps 2003 - 2008*.

SP AusNet's original Revenue Proposal explained that this tax now needs to be included in opex forecasts used in the calculation of the revenue cap for the forthcoming regulatory control period. The value of the land tax is directly related to the value of the land underlying the easements, and as such, the land tax is expected to increase at the same rate as the underlying land value. Therefore, SP AusNet's original Revenue Proposal assumed that the tax increases at the same rate as the average annual increase in Melbourne house prices over the last 20 years (*ABS Publication 6416.0 House Prices Indexes: Eight Capital Cities*). The resulting forecast included in SP AusNet's original Revenue Proposal is shown in Table 6.9.1.

Over the period, any positive or negative variation between the actual tax paid and the forecast approved by the AER will be recovered/reimbursed in accordance with SP AusNet's savings and transitional provisions in clause 11.6.21 of the NER. It should be noted that, unfortunately SP AusNet's original Revenue Proposal referred erroneously to clause 6A.7.3 of the NER, instead of the applicable savings and transitional provisions in clause 11.6.21. It is SP AusNet's view, that the provisions of 11.6.21 make the AEMC's intent clear, that is the operation of this clause allows tax to be passed through without application of the materiality threshold. SP AusNet has written separately to the AER to explain this interpretation.

Notwithstanding the incorrect reference made to clause 6A.7.3, SP AusNet's original Revenue Proposal noted correctly that SP AusNet will only recover the actual tax paid over the period.

Table 6.9.1 Easement Land Tax (2007/08 $m) Submitted by SP AusNet in its Original Revenue Proposal

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Easement Land Tax	81.6	84.8	88.2	91.8	95.4	99.2

Source: SP AusNet

As noted in section 6.1, information supplementing SP AusNet's original Revenue Proposal in relation to this matter has been provided in section 1.4 of Appendix H.

6.10 SP AusNet's Response to the Matters Raised in the AER's Draft Decision

6.10.1 Introduction and overview

Sections 6.2 to 6.9 of this revised Revenue Proposal have substantially replicated the information presented by SP AusNet's original Revenue Proposal. As noted earlier, this approach has been adopted because SP AusNet believes that much of the information presented in the original Revenue Proposal is relevant because it assists stakeholders in understanding the basis of the revised Revenue Proposal made by SP AusNet in response to the AER's Draft Decision.

In preparing its Draft Decision, the AER engaged Econtech and PB Strategic Consulting (PB) to undertake a review of SP AusNet's proposed forecast opex allowance to assess whether it is in accordance with the requirements of clause 6A.6.6 of the NER. The AER also undertook its own analysis and review in light of the consultants' findings and the opex factors set out in clause 6A.6.6(e) of the NER.

Based on these reviews, the Draft Decision concludes that the following adjustments set out below (Table 6.45 of the Draft Decision) should be made to SP AusNet's opex forecast.

Table 6.45 AER's draft decision – Opex (2007-08 $m)

	SP AusNet's proposal	AER's adjustment	AER's decision
Asset works	90.26	-4.69	85.56
Routine maintenance	206.63	-11.67	194.96
Corporate	117.71	-15.19	102.52
Rolled in assets opex	11.40	-4.92	6.48
Inventory	-	+0.24	0.24
Controllable opex	**426.00**	**-36.24**	**389.76**
Self-insurance	15.24	-6.86	8.37
Equity raising costs	11.81	-11.81	0.0
Debt raising costs	10.30	-3.72	6.58
Rebates	40.13	-31.60	8.52
Easement land tax	530.85	-14.60	516.25
Other opex	**608.34**	**-68.60**	**539.73**
Total opex	**1 034.34**	**-104.84**	**929.49**

Source: SP AusNet[340], AER analysis

The AER also noted in its Draft Decision[37] that SP AusNet's audited regulatory accounts were not available in time for the AER to incorporate the end of the 2006-07 financial year data into SP AusNet's proposal for the purposes of the draft decision. The AER commented that SP AusNet's audited results for the 2006-07 financial year will be taken into account in the AER's final decision when it is released in January 2008.

In accordance with the Draft Decision, SP AusNet's revised operating expenditure proposal includes a base year of 2006/07 with full year audited costs. For modelling purposes, SP AusNet has removed the one-off costs associated with the January bushfires in Victoria

[37] Ibid, page 7.

($640,000). SP AusNet has also updated forecasts for 2007/08 where better data has become available. For example, the 2007 preliminary land tax assessment has been issued by the Victorian State Revenue Office.

In this section, SP AusNet responds to each of the adjustments set out in table 6.45 above and the associated matters raised by the AER. In presenting this further information, SP AusNet has had particular regard to the AER's Draft Decision and the NER requirements in respect of opex forecasts. Appropriate cross-referencing to the Draft Decision and the NER is provided throughout the remainder of this section. In addition, cross-referencing is also provided to new supporting information, which is provided in appendices to this revised Revenue Proposal. SP AusNet's revised opex forecast is presented in section 6.11.

6.10.2 Asset works

The AER engaged PB to undertake a detailed review of SP AusNet's proposed operating expenditure for asset works. The AER proposed a reduction in SP AusNet's forecast operating expenditure for asset works to reflect the following matters:

- PB found that some external contractor costs had been subject to an erroneous double inflation escalation.
- In relation to the power cable repairs program, PB considered that as the condition of each of the joints necessitates the replacement of all the joints, testing each joint as it is removed is unnecessary. PB also recommended the removal of the $0.1 million variation between the costings in the detailed project specifications and the total project cost in SP AusNet's proposal.
- The detailed project costings for the tower foundation corrosion program show a total cost of $4.16 million for the project, whereas in the opex model the total project cost is $4.22 million. This difference is principally due to a modelling error.
- The AER's view is that the miscellaneous works allowance should be 1% of the controllable opex allowance.
- The AER concluded that the forecast allowance should be based on SP AusNet's bottom up cost estimate.

SP AusNet has reviewed each of the above matters noted by the AER in its Draft Decision. SP AusNet accepts the AER's findings as reasonable and has therefore adopted the AER's adjustments to asset works for the purposes of this revised Revenue Proposal.

6.10.3 Routine maintenance

The AER engaged PB to undertake a detailed review of SP AusNet's proposed operating expenditure for routine maintenance. The AER proposed a reduction in SP AusNet's forecast operating expenditure for asset works to reflect the following matters:

- PB's finding that 100% of the transmission business's insurance premiums have been allocated to the regulated side of the business.
- SP AusNet's capex and asset works programs would be expected to lead to a reduction in routine maintenance expenditure
- The cost savings arising from the newly renegotiated maintenance contract (the NW contract) should be included in SP AusNet's forecast of maintenance cost.

- For (non-easement) land tax, council rates and water rates the AER believes that a compound annual growth rate is a more suitable approach for escalating forecast costs.

SP AusNet has fully implemented the AER's adjustments to SP AusNet's forecast opex as set out in the Draft Decision in relation to the first two matters set out above. However, in relation to the latter two issues, SP AusNet does not believe that the AER's proposed adjustments are appropriate. In accordance with the NER, SP AusNet therefore addresses the matters raised by the AER's Draft Decision below. Tables setting out SP AusNet's revised routine maintenance expenditure proposal are then provided.

NW Contract

The AER has reduced SP AusNet's forecast maintenance costs by $6.8 million (2007/08 dollars) to account for the likely savings from the implementation of the new NW Maintenance Contract in 2007/08 onwards. SP AusNet believes the AER's approach is inappropriate in relation to:

- The calculation of the savings arising from the contract; and
- The regulatory treatment of those cost savings.

These matters are addressed in turn below.

NW Contract - Calculation of savings

The calculation of the savings arising from the NW contract is not straightforward because the contract is not a simple fixed price arrangement. Therefore, in order to calculate the costs arising from the new contract it is necessary to calculate the various elements of the contract price, including in particular the amount of person hours effort involved in conducting the necessary works.

The AER's consultant, PB, explained its approach as follows[38]:

> An open tender process resulted in two compliant tenders being received, one from Transfield and the other from Powercor. Transfield has held the contract for a considerable length of time, essentially since 1999. We believe that this would place the incumbent in an excellent position to understand the assets involved and hence able to forecast, with a good degree of accuracy, the amount of planned and unplanned work involved on an annual basis. Hence we regard the Transfield tender to be a reasonable proxy for the person-hours of effort factored into the opex model's base year, representing the effort required to provide routine maintenance and operation services to the assets covered by the contract; essentially two thirds of the SPA asset base, accounting for approximately half the total maintenance and operation effort.
>
> The two tenders appear reasonably similar with the lower costs associated with the Powercor tender resulting from lower support/overhead costs, slightly lower profit and a slightly lower allocation for unscheduled works.

PB analysed the difference between the Powercor and Transfield bids and reached the following conclusion in relation to the resulting cost savings:

> PB notes that this new contract, in net present terms (over 5-years), is $1.82m (2006/07) lower than the Transfield tender. We believe that as Transfield held the tender for a

[38] PB, SP AusNet Revenue Reset An independent Review, 16 August 2007, page 170.

> considerable time prior to it being let to Powercor they would have an excellent understanding of the work and hence costs associated with continuing to provide these services. Accordingly, we have used their pricing as a proxy for baseline costs.

The AER in its Draft Decision did not accept the PB analysis. Instead, the AER commented that:

> PB had assumed that the costs from Transfield's revised tender for the new contract are the same as the costs from Transfield's old contract. In the AER's view, it would be better to calculate the savings from the new contract more directly. Accordingly, the Draft Decision proposed revised calculations to estimate the savings from the new contract. These calculations were confidential in nature and therefore not disclosed publicly.

SP AusNet agrees in principle with the AER that the PB approach to estimating the savings from the new contract is conceptually weaker than the AER's more direct method. In particular, the PB approach involves a key assumption regarding the Transfield bid, and as such the calculation is vulnerable to this assumption being inaccurate.

On the other hand, the AER's more direct calculation of savings is also not free from assumptions. In particular, the AER calculation assumes that:

- the NW contract contains only "labour" and "maintenance" costs; and
- the contract accounts for 40% of total maintenance costs.

In fact, the AER's assumptions regarding the composition and size of the NW contract are not soundly based. As a result, the AER's estimated savings from the contract materially overstate the actual savings.

SP AusNet has provided further supporting information to the AER on a confidential basis to explain in detail the appropriate inputs to calculations undertaken in accordance with the AER's preferred methodology (NW Contract Analysis). By coincidence, the resulting calculations using the appropriate input data produces cost savings that are not materially different to PB's alternative calculation. For the purposes of this revised Revenue Proposal, therefore, SP AusNet would be prepared to accept PB's estimate of the cost savings arising from the new contract.

NW Contract - Treatment of savings

In reducing SP AusNet's opex, the AER states that:

> Under the NER, SP AusNet's opex forecasts must reasonably reflect a realistic expectation of the cost inputs required to achieve the opex objectives, among other criteria. The introduction of the new NW contract has an identifiable impact on SP AusNet's expected opex requirements in the forthcoming regulatory control period. Ignoring these expected savings would be inconsistent with the requirement that SP AusNet's forecasts reflect a realistic expectation of its opex cost inputs.)

It is important to emphasise that SP AusNet does not and never has disputed that cost savings will be achieved, rather it is the appropriate recognition of those savings within the regulatory regime which is in dispute. SP AusNet's reason for not including any of the forecast savings was quoted on page 156 of the Draft Decision:

> However, SPA's treatment (that is, ignoring these savings) is consistent with the regulatory regime where any further savings in the final year of the current period will in effect receive a five year glidepath during the next period as they will not be included in the base opex numbers.
>
> …
>
> SPA would expect that any efficiency savings achieved in the final year receive a five year glidepath.

In response, the AER asserted that

> In calculating the glide path amount, SP AusNet has averaged its actual and expected underspends in each year of the current regulatory control period, including the final year 2007-08. As a result, the expected 2007-08 efficiency gains resulting from the introduction of the new NW contract appear in SP AusNet's glide path calculation and subsequent glide path allowance. (p. 156, Draft Decision)

The AER further argued that:

> For SP AusNet to ignore these savings in forecasting its opex requirements means that SP AusNet would be rewarded for these savings twice; once through the glide path allowance, and again through its opex allowance. (p. 156, Draft Decision)

SP AusNet agrees with the AER that had SP AusNet's 2007/08 opex included the savings expected from the new NW contract, there would indeed be an element of double-counting of rewards in relation to those savings. However, SP AusNet did **not** incorporate the effects of the NW contract into the 2007/08 forecast actual expenditure in its original Revenue Proposal. This fact can be verified with reference to the opex model employed by SP AusNet and submitted to the AER on the 11 of April 2007, which derived the 2007/08 forecast actual expenditure by rolling forward the 2006/07 cost data without any adjustment for the NW contract.

Clearly then, SP AusNet's original Revenue Proposal did not involve a double-counting of the rewards associated with savings under the NW contract.

In light of the explanation provided above, SP AusNet has amended the glidepath calculation set out in Chapter 10, to take account of the additional savings that are expected to be associated with the new NW contract. This results in a modest increase in the glidepath amounts. Importantly however, SP AusNet has also reduced its opex forecast for the next regulatory period to take account of the savings that are now expected to be delivered by the new NW contract.

Land (non-easement) tax escalation

SP AusNet has updated its tax calculation to incorporate the 2007 preliminary land tax assessment that has been issued by the Victorian State Revenue Office. In effect this means that 2007/08 is being used as the base year for the forecasts.

The AER has accepted the use of the long term average of the ABS Melbourne house price index to calculate the appropriate escalator for tax going forward. However, the AER states that it is more appropriate to use a compound average rather than the arithmetic average SP AusNet has used in its calculations and has cut the land tax escalation from 4% to 3.63%.

SP AusNet does not dispute that the compound average would be the most appropriate method if that were the only consideration. However, SP AusNet has provided evidence with this

proposal (the Revised Land Tax Escalation Model) that the 4% assumption is already highly conservative given the actual increase in taxable value observed over the current regulatory period.

Since the beginning of the previous regulatory period the actual assessable tax value of SP AusNet's land has increased by 9.1% per annum in real term (using a compound average). Over the same period the ABS index has increased by 4.9% per annum in real terms. This strongly suggests that the ABS index is not representative of SP AusNet's land mix.

Given this clear illustration of the conservative nature and reasonableness of the 4% escalation, SP AusNet has retained forecasts based upon this escalation rate in the revised Revenue Proposal.

SP AusNet would also note that the compound real annual average increase in house prices over the 20 year period appears to be 3.73% not 3.63% as stated in the Draft Decision (refer to the Revised Land Tax Escalation Model for this calculation).

Revised routine maintenance and operations expenditure proposal

The revised routine maintenance and operations expenditure proposal is shown in Table 6.10.1 below.

Table 6.10.1: Routine Maintenance Costs 2003/04 to 2013/14 for the revised Revenue Proposal (real 2007/08 $m)

	2003/04	2004/05	2005/06	2006/07	2007/08*	2008/09*	2009/10	2010/11	2011/12	2012/13	2013/14
Maintenance	19.7	19.2	17.8	18.3	18.2	18.5	18.7	18.9	19.1	19.4	19.6
System operation	3.9	3.9	3.5	2.3	2.4	2.4	2.5	2.5	2.6	2.6	2.7
OHS	1.0	0.9	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Support	3.1	3.8	6.1	4.7	4.8	4.9	5.0	5.2	5.3	5.4	5.5
Revised Total	**27.6**	**27.8**	**28.2**	**26.0**	**26.1**	**26.5**	**26.9**	**27.3**	**27.7**	**28.1**	**28.5**
Original Total	27.6	27.8	28.2	25.2	25.7	26.3	26.8	27.4	27.9	28.5	29.1

* Actual to 2006/07, forecast to 2013/14.

Source: SP AusNet

In addition to the amounts shown above, the proposed allowances for the insurance and taxes components of routine maintenance are set out in Table 6.10.2 below.

Table 6.10.2: Insurance and Taxes 2003/04 to 2013/14 for the revised Revenue Proposal (real 2007/08 $m)

	2003/04	2004/05	2005/06	2006/07	2007/08*	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Insurance	2.9	3.0	2.8	2.5	2.9	2.7	3.0	3.1	3.3	3.3	3.3
Taxes/Leases	4.4	3.7	4.2	3.7	3.5	3.7	3.8	4.0	4.1	4.3	4.5
Revised Total	**7.3**	**6.7**	**7.0**	**6.1**	**6.4**	**6.4**	**6.8**	**7.1**	**7.4**	**7.6**	**7.8**
Original Total	7.3	6.7	7.0	7.3	7.3	6.6	7.0	7.4	7.7	7.9	8.0

* Actual to 2006/07, forecast to 2013/14.

Source: SP AusNet

6.10.4 Corporate Costs

The AER engaged PB to undertake a detailed review of SP AusNet's proposed operating expenditure for corporate costs. A particular issue of focus in PB's review was the costs of corporate services provided by SPI Management Company. The AER supplemented PB's review with its

analysis and benchmarking. As a result of the AER's further analysis, the Draft Decision reached the view that the costs incurred by SP AusNet through its services contract with the Management Company:

- do not reasonably reflect the costs that a prudent operator in the circumstances of SP AusNet would require to achieve the opex objectives; and
- should be adjusted downwards by an aggregate of $15.2 million over the forthcoming regulatory period.

SP AusNet does not believe that the AER's proposed adjustments are appropriate. In accordance with the NER, SP AusNet therefore addresses the matters raised by the AER's Draft Decision below.

Importantly, PB[39] reached the following conclusions in relation to its review of the Management Company and the allocation of costs to the transmission business:

> PB has reviewed the impact of the implementation of the Management Company and the allocation of management expenses to the transmission business. Based on the information provided, we have formed the opinion that the introduction of the Management Company has not resulted in any increased overheads. This is because the creation of SPI Management Services reallocated existing costs from SPA to SPI Management Services. The allocation of costs from SPI Management Services to the regulated entities re-allocates the appropriate part of those costs to the regulated entities.
>
> Furthermore we are satisfied that the survey method used to apportion costs to the individual businesses results in a reasonable outcome, with appropriate costs being allocated to the transmission business.

In summary, the independent review conducted by PB indicated that the introduction of the Management Company has not resulted in any increased overheads and the allocation of costs to the transmission business is reasonable. Consequently, PB did not recommend any downward adjustment to SP AusNet's forecast of corporate costs.

SP AusNet believes that PB's independent review was sufficiently thorough and conclusive to satisfy the requirements of Clause 6A.6.6(c) of the NER which states:

> The *AER* must accept the forecast of required operating expenditure of a *Transmission Network Service Provider* that is included in a *Revenue Proposal* if the *AER* is satisfied that the total of the forecast operating expenditure for the *regulatory control period* reasonably reflects:
>
> (1) the efficient costs of achieving the *operating expenditure objectives*;
>
> (2) the costs that a prudent operator in the circumstances of the relevant *Transmission Network Service Provider* would require to achieve the *operating expenditure objectives*; and
>
> (3) a realistic expectation of the demand forecast and cost inputs required to achieve the *operating expenditure objectives*.

Nevertheless, SP AusNet accepts the AER's right to conduct its own analysis in addition to the work of PB. In particular, SP AusNet notes that the AER argued that PB's conclusion on the cost impact of the management company was incorrect, as follows:

[39] Ibid, pages 170 and 171.

> The AER considers it is unlikely that the introduction of the management company did not result in increased management costs as:
>
> - the same cost reductions in the categories SP AusNet attributes to being management costs "stripped out", SP AusNet also attributes to being the ongoing savings due to the merger of the transmission and distribution businesses.[291]
>
> - at other times, SP AusNet attributes the 2006/07 decrease in HR, finance and other corporate costs of $5.6m, to be fully attributed to the 2005/06 permanent investment increase in IT costs (i.e. not attributed to the merger or the management costs being stripped out).[292] (p. 166, Draft Decision)

In making these comments, the Draft Decision refers to two documents (which are cited in footnotes 291 and 292 of the Draft Decision). In response to the two documents referred to by the AER, SP AusNet makes the following comments.

The first document cited, titled "SP AusNet, Opex – Merger/Restructure Effects" is a presentation (provided as Appendix K) explaining the key components (including the establishment of the management company) and overall effects of the merger of the distribution and transmission businesses. It concludes by showing that total controllable costs have **fallen** by $1.8M (3%) between 2004/05 and 2006/07 as result of the merger.

The second document the AER cites is SP AusNet's response to a question posed by the AER's consultants PB following the above presentation. The question and SP AusNet's full response (by email) is presented below[40]:

> ***PB Question:***
>
> "Can SPA provide confirmation that the step change in corporate costs in 2005/06 is due to the transfer of management costs principally from routine maintenance. If this is not the case could SP AusNet provide an explanation as to why there is a step change in corporate costs in that year?"
>
> ***SP AusNet response:***
>
> We have provided a comprehensive presentation on this to [the AER and PB] as part of our response on issue 28 [the presentation cited earlier]. In it, we explained that the 2005/06 year is the transition year between the stand alone transmission business (2004/05) and merged business (2006/07). As such, it contains several disruptions linked to the merger process.
>
> There is an increase in corporate costs of $3.8 million between 2004/05 and 2005/06. Of this, an increase of $1.5 million is due to the transfer of management costs from other areas of the business. This is only a part year effect as the management company was only in place for part of the year (about a third of the year). The full year effect is $4.3 million which shows up in the 2006/07 year.
>
> The rest of the increase ($2.3 million) is due to short term expenditure in the Finance, HR and other corporate areas to put the merger in place and a permanent increase in IT costs as an investment is made in superior systems to manage the larger and more complex business. The benefits of this investment is fully revealed in the 2006/07 accounts where HR, Finance and other corporate costs fall by $5.6 million on a permanent basis. This decrease is being fully passed back to customers through the use of the 2006/07 year as the base year.

The AER has interpreted this statement as contradicting PB's conclusion that the introduction of the management company did not result in increased management costs. SP AusNet does not

[40] SP AusNet, Issue 112 and 113, Email, 21 May 2007

believe that the above answer is inconsistent with PB's conclusion. In fact, PB's report[41] examined and supported SP AusNet's claims in this regard:

> PB has reviewed the assertions made by SPA in relation to the exclusion of any merger costs in the 2006/07 base year and concluded that these assertions are correct. This opinion is based on comparing the total opex spend for routine maintenance and corporate costs for the 2004/05 and 2006/07 financial years in real 2007/08 dollars. This comparison shows that the total spend in 2004/05 was $43.3m and for 2006/07 was $43.2m, indicating that in fact the aberration in the 2005/06 financial year was due primarily to the formation of the Management Company resulting in the transfer of management costs from routine maintenance to corporate costs over the period reviewed.

As already noted, SP AusNet fully appreciates and supports the AER's right to revisit and test the recommendations and conclusions of its consultants. In this instance, however, PB's conclusions are correct and should have been accepted by the AER. In terms of approach, SP AusNet notes that it is simpler and more robust to examine the overall effect on operating costs as a result of the introduction of the management company. SP AusNet has conclusively shown that the merger and reorganisation of the business, of which the establishment of the management company was an integral part, has resulted in lower costs to the business and customers. The overall outcome is, therefore, demonstrably efficient and the corporate cost forecasts originally submitted by SP AusNet are consistent with the requirements of clause 6A6.6(c).

SP AusNet is further disappointed that the AER in its Draft Decision[42] presented the following reasoning for developing its own benchmark for corporate costs:

> "As stated above, under cl. 6A.6.6(e)(9) of the NER the AER must have regard to the extent to which SP AusNet's forecast opex is referable to arrangements with a person other than SP AusNet that, in the opinion of the AER, do not reflect arm's length terms.
>
> To form the AER's opinion on whether the management services agreement reflects arrangements on arm's length terms, the AER calculated the following bottom up estimate of the expected level of management costs that would be incurred by a benchmark efficient TNSP in SP AusNet's circumstances."

SP AusNet has always accepted that the management services agreement is not an arm's length arrangement. As such, SP AusNet fully supports the AER's right to review the basis on which the forecasts have been presented. As noted above, SP AusNet supports PB's review which properly focused on the question of whether the new arrangements had caused costs to increase. In contrast to PB's approach, the AER developed its own alternative benchmark to analyse the reasonableness of SP AusNet's corporate costs.

Unfortunately, the alternate benchmark that the AER has provided is seriously flawed. The construction of the benchmark relied upon labour costs data presented in the SAHA report, which was prepared for a different purpose. As a result, the costs in the SAHA report are for SP AusNet as a whole and do not provide a fair or reasonable representation of the labour costs in the Management Company.

In addition, SP AusNet supplied data to SAHA for the executive costs which included remuneration for only the part of the year the executive was employed. Regrettably, SP AusNet did not alert SAHA to the need to annualise these salary costs before the average was calculated. Once corrected, the actual average salary costs for the Management Company in 2006/07 was $387,767 for the 9 General Mangers and $167,515 for the other 78 staff.

[41] Ibid, page 171.
[42] Ibid, 163.

It is also essential to note that the AER's proposed benchmark focuses only on labour costs. The benchmark provides no allowance for the breadth of functions supplied by the Management Company to SP AusNet, and therefore the benchmark is not appropriately scoped or costed. The additional functions not recognised by the AER's benchmark include consulting, legal, accountancy and administration services.

Evidently, establishing a truly independent benchmark for management services is not a straightforward task. It is widely recognised that it is challenging to develop robust benchmarks that take proper account of the broad range of alternate business models and operating structures. In the absence of a common business structure and cost allocation methodologies across companies, benchmarking corporate costs will remain highly problematic.

In light of the above observations, SP AusNet strongly questions whether the benchmark established by the AER for corporate costs is adequate for the purposes of clause 6A.6.6(e)(4) of the NER, which requires the AER to have regard to benchmark operating expenditure that would be incurred by an efficient Transmission Network Service Provider over the regulatory control period. SP AusNet notes that its original Revenue Proposal referenced more conventional and robust benchmarking information, with the objective of addressing clause 6A.6.6(e)(4). For completeness, these benchmarking studies have been included in this revised Revenue Proposal, and the results summarised in section 1.5 as follows:

> Benchmarking studies confirm that SP AusNet's operational effectiveness places the company at the forefront of the transmission sector in Australia and the world. SP AusNet participated in the latest round of international benchmarking – International Transmission Operations and Maintenance Study (ITOMS 2005). The results of this study indicate that SP AusNet remains one of the most cost-efficient transmission entities.

SP AusNet further notes that clause 6A.6.6(e)(5) of the NER states the AER must have regard to the actual and expected operating expenditure of the provider during any preceding regulatory control periods. On balance, SP AusNet contends that the Draft Decision has not given sufficient weight to this provision in its consideration of SP AusNet's forecast corporate costs. In the following paragraphs, SP AusNet provides further substantiation and explanation of SP AusNet's actual costs.

In its original Revenue Proposal, SP AusNet removed all performance-related fees paid to the Management Company. This approach ensures that only those costs incurred in the provision of prescribed services are allocated to the transmission business. Since its original Revenue Proposal, final data for the 2006/07 base year is now available for the actual costs incurred by the Management Company in the provision of contracted services to SP AusNet. It shows that the expenses of the Management Company, excluding finance charges, were $24.12M in 2006/07. Details explaining the breakdown of these actual costs are set out in bullet points below. SP AusNet is prepared to provide further substantiation of this information if requested by the AER.

The categories of costs with in the Management Company are as follows:

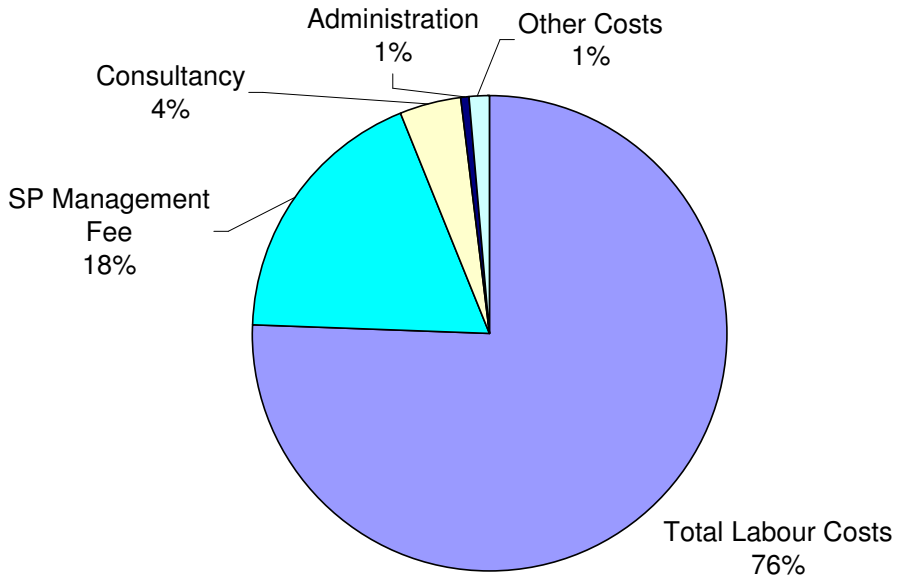
- management services supplied by the Management Company's Australian based staff (essentially labour costs);
- minor consultancy costs associated with the supply of management services;
- minor other costs such as administration and external legal advice associated with the supply of management services; and
- a management fee to cover the expenses for services of Singapore based staff (essentially labour costs).

The services of Singapore based staff are a fundamental component of management of SP AusNet, that is the three licensed entities, electricity transmission and distribution and the gas distribution businesses that are SP AusNet's core business. The services are provided by senior executives, such as the Group Chief Executive, the Chief Finance Officer, the Head of Financial Management and Planning, the Head of Lead and Corporate Secretarial and the Director of SP Power Grid. The services cover all aspects of good corporate governance, including:

- accountability;
- planning;
- financial reporting;
- corporate funding (treasury);
- risk management;
- audit; and
- due diligence.

The breakdown of costs in the Management Company is shown in the figure below.

Figure 6.10.1: SPIMS Costs 2006/07



Source: SP AusNet

Whilst the actual cost incurred by the Management Company in 2006/07 was $24.12M, the contract for services provides for a charge of only $21.420M to SP AusNet. In this revised Revenue Proposal SP AusNet willingly accepts that the lower figure of $21.420M should be used as the basis for establishing the transmission component of the Management Company fee. Of this $21.420M, 35% was allocated to the transmission business. Of this, 91.46% was allocated to the regulated transmission business. The final number of $6.856M appears in the 2006/07 Regulatory Accounts. An analysis of these costs is provided in the confidential Appendix L.

SP AusNet notes that a cost-based assessment of the services provided by the Management Company would support a higher corporate cost than the amount sought by SP AusNet. In SP AusNet's view, the forecasting approach applied in its original Revenue Proposal, and also adopted in this revised Revenue Proposal, is consistent with recognising the actual costs

incurred by SP AusNet as a transmission business. Nevertheless, if the AER considers that the Management Company's actual costs should be adopted, SP AusNet would also agree to that approach. SP AusNet calculates that the relevant amount using a cost-based approach would be $7.721M.

SP AusNet believes that the above information demonstrates that the proposed corporate cost of $117.7M is justified in accordance with clauses 6A.6.6(e) (1) and (5) of the NER. This conclusion is consistent with PB's recommendation in its independent review of the Management Company costs. Therefore, SP AusNet believes its original management fee costs should be reinstated in full, subject to the update of the 2006/07 costs.

6.10.5 Rolled-in assets opex

The Draft Decision stated that the AER considers that it is only prudent for routine maintenance (excluding taxes and insurance) and corporate costs to be escalated to cover the efficient opex relating to the assets SP AusNet is rolling into its RAB at the start of the forthcoming regulatory control period. Under the Draft Decision, the escalation factors to be used for these categories are 1.021 and 1.031, respectively. Based on these findings, the AER considers the allowance sought by SP AusNet is overstated, and recommends an adjustment of $4.9m to provide a revised estimate which the AER is satisfied reasonably reflects the opex criteria.

SP AusNet accepts this aspect of the Draft Decision, and has adopted the Draft Decision's proposals regarding rolled in assets opex in the preparation of this revised Revenue Proposal. Nonetheless, numbers will vary as routine maintenance and corporate costs have changed.

6.10.6 Inventory

In relation to inventory, the Draft Decision proposes to deduct $0.24 M from the capex forecast for inventory, and add a similar amount to the opex allowance (on the basis that the AER considers SP AusNet misclassified some inventory as capex instead of opex).

SP AusNet accepts this aspect of the Draft Decision, and has adopted the Draft Decision's proposals regarding inventory costs in the preparation of this revised Revenue Proposal.

6.10.7 Self Insurance

The Draft Decision stated that the AER considers that SP AusNet has demonstrated that its proposal to self-insure in those areas of the shared transmission network that SP AusNet cannot efficiently insure in the open market is, in principle, prudent. Having reviewed the analysis by SAHA, and the assessment by PB, the AER stated it is satisfied that SP AusNet's proposed allowances for self-insurance against the following risks reasonably reflect the prudent and efficient costs of self-insurance in the context of the opex objectives:

- Bushfire liability risk
- Risk of theft at remote stations
- Risk of GIS failures
- Risk of bomb threats, extortion and acts of terrorism
- Key person risk
- Insurer's credit risk, and
- Risk of non-terrorist impact of planes and helicopters

The AER has, however, reduced the allowance for non-insured risk (on the basis of a recommendation from PB) in the following areas:

- risk of property damage to towers and lines;
- risk of power and current transformer failure; and
- risk of circuit breaker failure.

In essence, PB recommended that alternative failure rates for these assets, sourced from SP AusNet's own data be substituted for some of the international or industry wide data used for the assessment. SP AusNet asked its consultants, SAHA International, to review the PB analysis. In response, SAHA has prepared a supplementary report on the three risks where PB recommended significantly reduced allowances.

Based on the findings of this report, SP AusNet has proposed a new non-insured risk allowance outlined in Table 6.10.3 below. The revised proposal implements the Draft Decision except for the proposed variations in the three risk areas outlined above. The reasoning for the variations is fully documented in the SAHA supplementary report attached as Appendix N.

Table 6.10.3: Costs of Non-insured risks for inclusion in revised Revenue Proposal (2007/08 $m)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Revised Non insured risks	**2.52**	**2.52**	**2.52**	**2.52**	**2.52**	**2.52**
Original Non insured risks	2.54	2.54	2.54	2.54	2.54	2.54

Source: SP AusNet

6.10.8 Equity Raising Costs

The Draft Decision disallowed equity raising costs. The Draft Decision also distinguished between equity raising costs on the initial asset base and those associated with the proposed capex program. SP AusNet has reflected this distinction when discussing the issues below.

Equity raising costs associated with the initial asset base

The Draft Decision concluded that no allowance should be provided for equity raising costs in the forthcoming regulatory period. In explaining its decision, the AER referred to a report by ACG (commissioned in 2004 by the AER) as follows:

> Consistent with the ACG report and the recent Powerlink decision, the AER considers that the relevant issue is whether a RAB has been established in a previous regulatory decision. In this regard, the AER disagrees with SP AusNet, in that ACG's recommendation is not limited to whether or not an asset value was established in Victoria before the 2002 decision, but applies if a RAB has been established in a previous regulatory decision. As the ACCC had already determined SP AusNet's opening RAB, as at 1 January 2003, in the last Victorian decision, and that RAB is being rolled forward, there is no case to include an equity raising cost allowance in this revenue cap decision. (p. 177, Draft Decision)

SP AusNet understands the AER's reasoning, which appears on its face to reflect the advice provided by the ACG report for the ACCC:

> If an RAV has already been established for the regulated utility there is no case for now including an allowance for IPO costs. It must be assumed that such costs have already been included in the RAV, either explicitly or implicitly. (p. 54, ACG report)

SP AusNet's strongly held view, however, is that the drafting of the ACG report is unfortunate because it allows the apparently unequivocal advice to be taken out of context. In fact, the advice from ACG to the ACCC properly applied should consider the following matters.

- Firstly, equity raising costs should, ideally, either be allowed for in the RAV or as a separate operating cost allowance.
- Secondly, if an initial RAV has been established prior to the first regulatory review it is reasonable to conclude that equity raising costs have been included in the RAV. In this instance, no further allowance for equity raising costs should be provided.
- Thirdly, if an initial RAV has not been established and it is established in a manner that does not provide for an equity cost allowance, then it would be reasonable to provide an equity raising cost allowance as an operating expenditure.
- Fourthly, and most importantly, in the latter instance it would be reasonable for the regulator to continue to provide an on-going allowance for equity raising costs in future revenue reviews, even though a RAV might have been established at the commencement of those later reviews.

In relation to the above steps, SP AusNet believes that the ACG report to the ACCC may not have been sufficiently clear and therefore the report has been misinterpreted by the AER. SP AusNet has therefore asked ACG to clarify its views on this matter. ACG's opinion is provided at Appendix O.

In SP AusNet's case, at the time of the 2002 Revenue Reset, there was no established RAV. The RAV was established for the first time in the ACCC's Final Decision. Simultaneously, the ACCC allowed SP AusNet an amount for equity raising costs as an operating expense. Whilst neither the ACCC nor SP AusNet could have known at the time, the ACCC's approach in its 2002 Decision for SP AusNet was in fact consistent with the advice that it was to later receive from ACG. In other words, the decision to allow an equity raising cost as an operating expense was correct given that there was not a pre-existing RAV and, importantly, the RAV established using an ODRC value did not include the costs of equity raising.

Therefore, in accordance with ACG's advice, it remains appropriate for the AER to allow an equity raising cost in SP AusNet's operating expenditure. This reflects the fact that SP AusNet's initial RAV did not include equity raising costs, and it follows that the current rolled-forward RAV also does not include equity raising costs. SP AusNet further notes that ACG's advice in Appendix O confirms that this conclusion is appropriate. For this reason, SP AusNet maintains its approach to equity raising costs as presented in its original revenue proposal.

Equity raising costs associated with proposed capital expenditure

SP AusNet has performed an analysis of its ability to finance its proposed capex program from retained earnings (using benchmark financing assumptions). Based on the results of this analysis, SP AusNet agrees with the Draft Decision's finding that the company can fund its proposed capex over the forthcoming period without requiring further equity finance.

Equity raising costs - Conclusion

For the revised Revenue Proposal, SP AusNet has calculated the equity raising costs only on the assets comprising the initial asset base (excluding the rolled in assets and work in

progress); therefore, the allowance declines over time as that initial asset base depreciates. The equity raising costs are shown in Table 6.10.4.

This calculation continues the methodology used for its existing Revenue Cap Decision. If the AER is of the opinion that costs should be capitalised as per the ACG advice, SP AusNet could accommodate such an approach through a modification to its proposed asset base.

Table 6.10.4: Equity Raising Costs (2007/08 $m)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Revised equity raising costs	**1.7**	**1.6**	**1.6**	**1.5**	**1.5**	**1.4**
Original equity raising costs	1.9	1.9	2.0	2.0	2.0	2.0

Source: SP AusNet

6.10.9 Debt Raising Costs

SP AusNet's original Revenue Proposal included an allowance for debt raising costs of 12.5 basis points.

The Draft Decision stated that the AER does not consider that 12.5 basis points reflects the debt raising costs that a prudent operator in the circumstances of SP AusNet would require to achieve the opex objectives. Rather the AER considers, following updated ACG methodology, that a reasonable benchmark of opex that would be incurred by an efficient TNSP in SP AusNet's circumstances is 8.3 basis points. Accordingly, the AER made a downward adjustment of $3.7 million to SP AusNet's proposed allowance for debt raising costs, giving a revised estimate of $6.6 million.

For the purposes of this revised Revenue Proposal, SP AusNet has adopted the Draft Decision with regard to the 8.3 basis points. Nonetheless, the outcome will vary as the opening RAB and forecast capex has changed. The debt raising costs are shown in Table 6.10.5.

Table 6.10.5: Debt Raising Costs (2007/08 $m)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Revised debt raising costs	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.2**
Original debt raising costs	1.1	1.1	1.1	1.1	1.1	1.2

Source: SP AusNet

6.10.10 Rebates (Availability Incentive Scheme)

SP AusNet's response to the Draft Decision's proposals regarding the allowance for the expected value of rebate payments to be made to VENCorp under the Availability Incentive Scheme is set out in section 4.6. Based on the position set out in section 4.6, the allowance for rebate payments under the Availability Incentive Scheme adopted for the purpose of this revised Revenue Proposal are set put in Table 6.10.6 below.

Table 6.10.6: Rebate payments under Availability Incentive Scheme (2007/08 $m)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Revised rebate costs	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**
Original rebate costs	6.6	6.6	6.6	6.6	6.6	6.6

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

Source: SP AusNet

6.10.11 Easement Land Tax

SP AusNet seeks certainty of the pass through of the cost of the Easement Land Tax. SP AusNet neither seeks to over or under recover the cost of the Easement Land Tax. SP AusNet has no influence on the cost of the Easement Land Tax and, therefore, considers it should be passed through, without gain or loss to SP AusNet.

The arrangements in place since the Easement Land Tax was imposed in 2004 have allowed pass through. However, the AER advised SP AusNet on 10 September 2007, on a preliminary basis, that the AER is of the opinion that the relevant NER provisions suggest the easement pass through provisions are subject to the application of the materiality threshold[43].

SP AusNet accepts the Draft Decision only on the basis of the continuation of arrangements that provide a full pass through of the Easement Land Tax, consistent with the commitments made by the Victorian Government in relation to easement land tax in 2004.

The revised easement land tax costs are shown in Table 6.10.7. These costs are reflected in the building block calculations in this revised Revenue Proposal. However, SP AusNet requests that the AER also considers the alternate approach described below.

Table 6.10.7: Easement land tax (2007/08 $m)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Revised easement land tax	**76.1**	**84.1**	**81.6**	**90.2**	**87.5**	**96.7**
Original easement land tax	81.6	84.8	88.2	91.8	95.4	99.2

Source: SP AusNet

As stated in section 6.9 above, it is SP AusNet's view that the provisions of 11.6.21 make the AEMC's intent clear that the operation of this clause should allow easement land tax to be passed through without application of the materiality threshold.

If the AER concludes that the relevant NER provisions suggest the easement pass through provisions are subject to the application of the materiality threshold, then the intent of the AEMC to provide for a full pass through of easement land tax has not been achieved.

In these circumstances, SP AusNet requests that the AER includes in its Final Decision a forecast of the Easement Land Tax that substantially reduces the risk to SP AusNet that the actual Easement Land Tax is higher than forecast. Furthermore, SP AusNet would commit to recovering only the actual tax incurred by SP AusNet, even if the AER's interpretation of the NER does not require SP AusNet to do so. SP AusNet strongly believes that this alternate approach would be consistent with the requirements of the clause 6A.6.6(c)(1) and (2), which requires the AER to accept operating expenditure forecasts that are efficient and prudent

The calculation of the alternate forecast of the Easement Land Tax is described below.

Alternative forecast easement land value

The AER has proposed a real annual escalation of 3.55%. This is based upon a weighted average of the 20 year historical average increase in Melbourne house prices (25%) with the historic average increase in rural Victorian house prices (75%).

[43] AER Letter to SP AusNet on the 10 September 2007 titled "Pass through of easement land tax (variation between actual and allowance) in future regulatory periods".

The 25%/75% split used by the AER is sourced from SP AusNet's response to the AER's Request for Further Information under Clause 6A.11.1 of the NER (attached as Appendix H). That document stated "SP AusNet records show approximately 25 percent of easements are urban and 75 percent rural". This document was referring to the number of easements, not the value. SP AusNet's distribution of easement value is approximately 61% urban and 39% rural[44].

Furthermore, as outlined in the discussion of land taxes, SP AusNet has provided evidence with this proposal (the Revised Land Tax Escalation Model) that the 4% assumption in SP AusNet's original revenue proposal was a conservative forecast given the actual increase in taxable value observed over the current regulatory period for its land portfolio.

Since the beginning of the previous regulatory period the actual assessable tax value of SP AusNet's land has increased by 9.1% per annum in real terms (using a compound average). Over the same period the ABS index has increased by 4.9% per annum in real terms.

Given that the easement portfolio is more heavily distributed in urban areas than the land portfolio by value and that the easement tax is of an order of magnitude larger than the standard land tax liability discussed above, SP AusNet is concerned about the risks of using such a low escalator on its ability to recover the easement tax in full. Therefore, SP AusNet advocates use of the 9.1% real escalator to estimate its future easement land tax liability.

The alternative revised easement land tax costs are shown in Table 6.10.8.

Table 6.10.8: Easement land tax (2007/08 $m)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Revised easement land tax	**76.1**	**93.4**	**90.6**	**111.1**	**107.9**	**132.3**
Original easement land tax	81.6	84.8	88.2	91.8	95.4	99.2

Source: SP AusNet

6.11 SP AusNet's Opex Forecast for this Revised Revenue Proposal

Section 6.10 considered carefully the matters raised by the AER in its Draft Decision, and SP AusNet provided additional information in response to the AER's issues. In light of the analysis and further information presented in section 6.10, this section presents SP AusNet's revised opex forecasts.

It should be noted that SP AusNet will continue to deliver an efficient opex program as illustrated by the company's performance in the current regulatory period. As noted in section 3.6, opex benchmarking analyses demonstrate that SP AusNet's operational efficiency places it at the forefront of the transmission sector in Australia. This provides confidence to stakeholders that the proposed opex in the forthcoming regulatory period is efficient and consistent with delivering appropriate compliance and service outcomes. The present shortage of skilled labour and the resource and construction boom will continue to place upward pressures on the costs of efficiently procuring and deploying operating and maintenance resources.

Despite these pressures, SP AusNet plans to deliver an efficient overall opex program in the forthcoming regulatory period at a total cost that represents a modest increase on the actual opex incurred in the current period. The total opex costs are shown in Table 6.11.1.

[44] Sourced from the State Revenue Office valuation provided to the AER on 30 April 2007

Table 6.11.1: Total Opex Costs (2007/08 $m)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Controllable Opex	66.5	67.8	69.7	70.4	71.8	72.5
Self-insurance	2.5	2.5	2.5	2.5	2.5	2.5
Easement Land Tax	76.1	84.1	81.6	90.2	87.5	96.7
Rebates	3.5	3.5	3.5	3.5	3.5	3.5
Debt Raising Cost	1.1	1.1	1.1	1.1	1.1	1.2
Equity Raising Cost	1.7	1.6	1.6	1.5	1.5	1.4
Revised Total Opex Costs	**151.5**	**160.7**	**160.0**	**169.3**	**168.0**	**177.8**
Original Total Opex Costs	161.2	166.9	172.7	177.5	182.4	187.5

Source: SP AusNet

In addition to this opex commentary, SP AusNet has supplied the AER:

- a presentation on the merger of the transmission and distribution businesses a Appendix K;
- an analysis of the Management Company costs as confidential Appendix L;
- the 2007 Land Tax Assessment as Appendix M;
- a response from SAHA on Draft Decision modifications to self insurance as Appendix N;
- a letter from ACG on equity raising costs Appendix O;
- a revised opex spreadsheet model;
- a revised land tax escalation spreadsheet model; and
- a spreadsheet analysis of the savings arising from the NW Maintenance Contract.

7 Regulatory Asset Base

7.1 Introduction

A high level summary of how the Regulatory Asset Base (RAB) was constructed in SP AusNet's original Revenue Proposal is set out in the following sections, together with relevant background information, as follows:

- Section 7.2 describes the establishment of an opening RAB as at 1 January 2003;
- Section 7.3 outlines the rolling forward of the asset base to 1 April 2008 using Depreciation from the 2003 Decision (adjusted for actual inflation) and actual capex and inflation up until 2005/06 and forecasts of capex and inflation for 2006 / 07 and 2007 / 08;
- Section 7.4 provides information on the rolling in of assets related to non-contestable excluded services; and
- Section 7.5 provides information on the rolling-in of work in progress in accordance with the change to the AER's preferred regulatory accounting methodology;
- The AER's Draft Decision did not accept all of SP AusNet's calculations and suggested some changes. These matters are discussed in section 7.6, and SP AusNet's revised RAB calculation is set out in section 7.7.

7.2 Establishing the Opening Regulatory Asset Base as at 2003 Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that under the NER promulgated on 16 November 2006, each TNSP has a Regulated Asset Base (RAB) established on a certain specified date. Clause 6A.6.1 of Chapter 6 and Clause S6A.2.1 of Schedule 6A.2 establishes SP AusNet's opening RAB as at 1 January 2003 as $1,835.60 million, adjusted for any difference between the estimated and actual capital expenditure for the previous regulatory control period. SP AusNet has adjusted this value for the difference between estimated and actual capital expenditure for the nine months of 2002 / 03, before the start of the current regulatory period (1 April 2002 to 31 December 2002).

SP AusNet's original Revenue Proposal explained that SP AusNet did not adjust these numbers further to remove the benefit associated with this difference, given its understanding of the AER agreed approach. SP AusNet commented that the AER has stated that it will not claw back any benefit from a capex underspend for the period 2002 / 03 to 2007 / 08, subject to outcomes of a prudency review of that capex. This agreement reached with the AER is protected under Clause 11.6.9 of the NER.

In accordance with these provisions, SP AusNet's original Revenue Proposal established an adjusted opening RAB as at 1 January 2003 of $1,788.3 million.

7.3 Roll Forward of 2003 Regulatory Asset Base Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that under the NER, Clause 6A.6.1 of Chapter 6 and Schedule 6A.2 established the methodology to be used for the roll forward of the RAB.

Under Clause 11.6.9 of the NER, this approach can be modified having regard to the existing revenue determination and other arrangements agreed with the AER. SP AusNet's original Revenue Proposal commented that the agreed roll-forward approach for the current regulatory control period adjusts for outturn inflation, actual capital expenditure and disposals and inflation adjusted depreciation allowed for in the 2002 Decision.

7.3.1 Depreciation Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that to roll forward from the 2003 RAB, SP AusNet used economic depreciation as determined in the ACCC 2002 Final Decision adjusted for actual inflation (forecast for 2006 / 07 and 2007 / 08). Economic Depreciation is calculated by determining the nominal depreciation, and offsetting the CPI indexation for each asset class. The calculation of economic depreciation as presented in SP AusNet's original Revenue Proposal is shown in Table 7.3.1.

Table 7.3.1 Economic Depreciation 1 Jan 2003 to 1 April 2008 (Nominal $m) Submitted by SP AusNet in its Original Revenue Proposal

Year	2003^	2003/04	2004/05	2005/06	2006/07*	2007/08*
Depreciation	18.2	77.4	81.8	86.6	92.3	97.6
Indexation	-23.7	-36.8	-44.6	-57.4	-58.6	-52.0
Economic Depreciation	**-5.4**	**40.6**	**37.2**	**29.3**	**33.7**	**45.6**

^ Stub period from 1 January to 31 March 2003

* Forecasts

Source: SP AusNet Roll-forward Model

7.3.2 Capital Expenditure Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that to roll forward from the 2003 regulated asset base, SP AusNet used actual asset additions (net of disposals) for the period 2003 to 2005 / 06 and forecasts of capex (net of disposals) for 2006 / 07 and 2007 / 08. A comparison of the 2002 Decision allowances and actual capex as presented in SP AusNet's original Revenue Proposal is shown in Table 7.3.2.

Table 7.3.2: Net Capital Expenditure 1 Jan 2003 to 1 April 2008 (Nominal $m) Submitted by SP AusNet in its Original Revenue Proposal

Year	2002/03	2003^	2003/04	2004/05	2005/06	2006/07*	2007/08*
Actual Capex	38.2	30.4	52.4	71.2	102.1	108.9	116.3
Actual Disposals	-2.5	-2.5	-1.0	-2.2	-1.6	-0.8	-0.8
Actual Net Capex	**35.6**	**27.9**	**51.4**	**69.0**	**100.5**	**108.1**	**115.6**

^ Stub period from 1 January to 31 March 2003

* Forecasts

Source: SP AusNet Roll-forward Model

7.4 Roll-in of Non-contestable Prescribed Services Submitted by SP AusNet in its Original Revenue Proposal

In its 2002 Revenue Cap Application, SP AusNet (then SPI PowerNet) outlined its proposal for treatment of assets associated with providing non-contestable services that are initially outside

the revenue cap (under the Victorian Regulatory Arrangements) for the new regulatory period commencing on 1 April 2008. SP AusNet's original Revenue Proposal explained that this treatment is identical to that used in the previous 2002 ACCC Final Decision for excluded service assets completed during the 1997 to 2002 regulatory period. The description of the treatment is reproduced below:

> "…Where a service is non-contestable, having regard to the NEC definition, SPI PowerNet and its customer will write this into the Network Agreement or Connection Agreement.
>
> Contestable services provided by SPI PowerNet shall not form part of the revenue-capped services, at any time.
>
> For the duration of the prevailing (2003 to 2007/08) regulatory period, non-contestable services shall be the subject of a supplemental Network or Connection Agreement. The derivation of charges for the service shall be on the basis of:
>
> - the building block revenue model as described in this Application;
> - operating and maintenance charges based on incremental cost;
> - efficient establishment cost for the new services (as agreed in the Network or connection agreement); and
> - the Vanilla WACC applied using the parameters as proposed in this application but with updated variables.
>
> Charges for the 2008/09 to 2012/13 regulatory period in respect of non-contestable augmentations undertaken over the 2003 to 2007/08 period shall be determined via allocation of the next revenue cap in accordance with the charging allocation principles of the NEC. That is, the associated assets will be included in the RAB from 1 April 2008 and the costs of service provision will be captured within the overall revenue cap. "[45]

SP AusNet explained that this roll-in of assets is protected for SP AusNet under Clause 11.6.21 of the NER. Therefore, SP AusNet rolled-in assets associated with the provision of non-contestable services that were commissioned since the cut off date for the previous review.

SP AusNet's original Revenue Proposal explained that the major additions will be the non-contestable network and connection works such as interface and connection works at the Cranbourne Terminal Station and non-contestable work on the Snowy Interconnector Upgrade. A full list of projects was provided in Appendix D of SP AusNet's original Revenue Proposal, which is reproduced in this revised Revenue Proposal for ease of reference.

SP AusNet's original Revenue Proposal calculated that the value of those assets SP AusNet is rolling into the RAB on 1 April 2008 is $118.0 million (nominal)[46].

7.5 Roll-in of Work in Progress Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal noted that the AER's new regulatory accounting methodology published in Explanatory Statement accompanying the AER's post-tax revenue

[45] SPI PowerNet 2002 Application

[46] Includes projects completed and in service by31 December 2006. SP AusNet may update the project list for more recent projects in a supplementary submission at the time of the Draft Decision.

model (PTRM) requires capital expenditure for future regulatory periods to be recognised on an as-incurred basis rather than as commissioned.

Under this methodology the TNSP receives a return on its work in progress (WIP) as an alternative to capitalising interest during construction. In effect, this draws forward cash flows.

Therefore, SP AusNet commented that it is required to capitalise WIP (including regulatory finance during construction (FDC) incurred to date) as at 1 April 2008 and provide its capex forecasts on an as-incurred basis exclusive of regulatory FDC.

SP AusNet's original Revenue Proposal calculated the value of WIP to be capitalised into the RAB as $23.2 million.

7.6 SP AusNet's Response to the Matters Raised in the AER's Draft Decision

7.6.1 Overview of the Draft Decision

In its Draft Decision, the AER:

- accepted SP AusNet's proposed opening RAB;
- clarified the appropriate CPI to use in the roll-forward;
- removed of the benefit associated with the capex underspend in 2002;
- included the compounded return on prudent overspend during the current period;
- modified the roll-in amount for the non-contestable assets to be included in the RAB on 1 April 2008; and
- implemented the AER's Draft Decision on historic capex.
- SP AusNet's response to each of the matters raised in the Draft Decision is set out below.

7.6.2 Establishing the Opening Regulatory Asset Base as at 2003

SP AusNet has implemented the AER's Draft Decision. Clause 6A.6.1 of Chapter 6 and clause S6A.2.1 of Schedule 6A.2 establishes SP AusNet's opening RAB as at 1 January 2003 as $1,835.60 million, adjusted for any difference between the estimated and actual capital expenditure for the previous regulatory control period. SP AusNet has adjusted this value for the difference between estimated and actual capital expenditure for the nine months of 2002 / 03 (that is, 1 April 2002 to 31 December 2002) immediately before the start of the current regulatory period

In accordance with these provisions, SP AusNet's adjusted opening RAB as at 1 January 2003 was $1,788.3 million.

In addition, SP AusNet has implemented the Draft Decision with respect to removing of the benefit associated with the capex underspend in the nine months of 2002 / 03.

7.6.3 Roll Forward of 2003 Regulatory Asset Base

Under the new National Electricity Rules, Clause 6A.6.1 of Chapter 6 and Schedule 6A.2 establishes the methodology to be used for the roll forward of the RAB.

Under Clause 11.6.9 of the NER, this approach can be modified having regard to the existing revenue determination and other arrangements agreed with the AER. The agreed roll-forward

approach for the current regulatory control period adjusts for outturn inflation, actual capital expenditure and disposals and inflation-adjusted depreciation allowed for in the 2002 Decision. These adjustments are explained in further detail below.

Depreciation

SP AusNet has implemented the AER's Draft Decision. In particular, the appropriate lagged CPI has been used. The calculation of economic depreciation is shown in Table 7.6.1.

Table 7.6.1: Economic Depreciation 1 Jan 2003 to 1 April 2008 (Nominal $m)

Year	2003^	2003/04	2004/05	2005/06	2006/07	2007/08*
Depreciation	18.1	77.4	81.8	86.3	91.7	97.6
Indexation	-13.3	-43.7	-48.9	-53.9	-63.5	-52.1
Revised Proposal	**4.9**	**33.6**	**32.8**	**32.4**	**28.3**	**45.5**
Original Proposal	-5.4	40.6	37.2	29.3	33.7	45.6

^ Stub period from 1 January to 31 March 2003

* Forecasts

Source: SP AusNet Roll-forward Model

Capital Expenditure

SP AusNet has implemented the AER's Draft Decision with updated data for 2006/07 and 2007/08. In particular, the appropriate lagged CPI has been used.

Therefore, to roll forward from the 2003 regulated asset base value, SP AusNet has used actual asset additions (net of disposals) for the period 2003 to 2006 / 07 and forecasts of capex (net of disposals) for 2007 / 08. A comparison of the 2002 Decision allowances and actual capex is shown in Table 7.6.2. In accordance with the Draft Decision, the compounded return on prudent overspend has been added to determine the final closing RAB.

Table 7.6.2: Net Capital Expenditure 1 Jan 2003 to 1 April 2008 (Nominal $m)

Year	2002/03	2003^	2003/04	2004/05	2005/06	2006/07	2007/08*
Actual Capex	38.2	30.3	52.6	71.2	101.9	107.2	109.0
Actual Disposals	-0.8	-0.7	-1.0	-2.2	-1.6	-0.2	-0.4
Revised Proposal	**37.4**	**29.6**	**51.7**	**69.1**	**100.3**	**107.0**	**108.6**
Original Proposal	37.4	29.7	51.4	69.0	100.5	108.1	115.6

^ Stub period from 1 January to 31 March 2003

* Forecasts

Source: SP AusNet Roll-forward Model

7.6.4 Roll-in of Non-contestable Prescribed Services

SP AusNet has implemented the AER's Draft Decision. The value of those assets SP AusNet is rolling into the RAB on 1 April 2008 is $115.9 million (nominal).

7.6.5 Roll-in of Work in Progress

SP AusNet has implemented the Draft Decision. Capex forecasts for 2007/08 have been updated for the revised Revenue Proposal. The value of WIP to be capitalised into the RAB is $17.0 million (nominal).

7.7 SP AusNet's Regulatory Asset Base for this Revised Revenue Proposal

The written-down value of the rolled forward RAB as at 1 April 2008 is **$2,190.8 million**. The roll-forward is summarised in Table 7.7.1. A breakdown by asset category is provided in Table 7.7.2

Table 7.7.1 Asset Base Roll-Forward from 1 Jan 2003 to 1 April 2008 (Nominal $m)

Year	2003^	2003/04	2004/05	2005/06	2006/07	2007/08*
Opening Asset Base	1788.3	1813.0	1831.0	1867.2	1935.0	2013.8
Indexation	13.3	43.7	48.9	53.9	63.5	52.1
New Assets (Net Capex)	29.6	51.7	69.1	100.3	107.0	108.6
Depreciation	-18.1	-77.4	-81.8	-86.3	-91.7	-97.6
Closing Asset Base	1813.0	1831.0	1867.2	1935.0	2013.8	2076.9
Excluded Assets						115.8
Add compound return on prudent capex overspend						8.1
Removal of benefit associated with 2002 capex adjustement						-27.1
Work in progress						17.0
Revised Proposal Opening RAB 1 April 2008						**2190.8**
Original Proposal Opening RAB 1 April 2008						2222.9

^ Stub period from 1 January to 31 March 2003.

* Forecasts

Source: SP AusNet

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

Table 7.7.2: Regulatory Asset Base on 1 April 2008 (Nominal $m)

Asset Class	Value 1 April 2008	
	Original Proposal	Revised Proposal
System Assets		
Secondary	194.4	149.1
Switchgear	363.6	354.8
Transformers	162.0	167.1
Reactive	92.4	87.7
Lines	1022.6	1044.5
Establishment	87.7	99.8
Communications	27.7	8.2
Non System Assets		
Inventory	7.2	7.3
IT	39.0	42.2
Vehicles	2.5	4.2
Other business support	8.3	12.8
Premises	10.3	8.4
Land	96.3	95.8
Easements	108.8	109.0
Regulatory Asset Base	**2,222.9**	**2,190.8**

Source: SP AusNet Roll-forward Model

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

8 Depreciation

8.1 Introduction

SP AusNet's original Revenue Proposal explained that under Clause 6A.6.3 of the NER, depreciation schedules must use a profile that reflects the nature of the category of assets over the economic life of that category of assets.

SP AusNet explained that it had depreciated each asset category in the Regulated Asset Base (RAB) on a straight-line basis over the economic life proposed. As per Clause 6A.6.3, SP AusNet has followed standard practice by assigning a regulatory life to assets that equate to their expected economic or technical life. In general, the regulatory, economic and technical lives of an asset coincide.

SP AusNet's original Revenue Proposal explained that the asset life used in each asset category represents the weighted average of all the assets in that category. It was further noted that within an asset category, individual assets may have an expected life that can be substantially different to this average. For example, circuit breakers have an average expected life of 45 years; however, 66 kV equipment can be expected to last between 50-55 years, while 500 kV circuit breakers, under considerably more electrical stress, may only last 35-40 years.

SP AusNet explained that it generally has assigned technical lives for its assets that are longer than those applied by the other Transmission Network Service Providers (TNSPs) in Australia.

The remainder of this Chapter is structured as follows:

- Section 8.2 explains the depreciation proposal submitted by SP AusNet in its original Revenue Proposal;
- Section 8.3 notes the comments raised by the AER in its Draft Decision; and
- Section 8.4 presents an amended depreciation calculation for this revised Revenue Proposal.

8.2 Depreciation Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that SP AusNet proposed to vary the regulatory lives from the previous regulatory control period to better reflect the true economic life of the asset categories in two instances.

Firstly, SP AusNet commented that it is appropriate to lower the life of the secondary asset base from 25 years to 15 years for both the existing asset base and new assets. This is driven by:

- the substantial replacement of analogue secondary equipment;
- the shorter life of “off the shelf” digital equipment; and
- the SCADA systems and RTU in the secondary asset base having a technical life closer to 10 years.

SP AusNet noted that this life aligns with the standard life used for secondary assets by other TNSPs.

Secondly, SP AusNet also proposed to align its regulatory and statutory lives for IT and business support costs in the future.

Standard lives for the various asset classes for the future regulatory control period as submitted by SP AusNet in its original Revenue Proposal are shown in Table 8.2.1.

Table 8.2.1: Standard Lives for Assets Submitted by SP AusNet in its Original Revenue Proposal

Asset Class	Standard Life
System Assets	
Secondary	15
Switchgear	45
Transformers	45
Reactive	40
Lines	60
Establishment	45
Communications	15
Non System Assets	
Inventory	Not depreciated
IT	5
Vehicles	3
Buildings	10
Other business support	10
Land	Not depreciated
Easements	Not depreciated

Source: SP AusNet

Depreciation from 1 April 2008 to 31 March 2014 as submitted by SP AusNet in its original Revenue Proposal is shown in Table 8.2.2.

Table 8.2.2: Depreciation 2008/09 to 2013/14 (Nominal $m) Submitted by SP AusNet in its Original Revenue Proposal

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Depreciation	110.8	121.0	130.2	139.1	147.2	144.4
Indexation	-67.2	-70.2	-73.2	-76.2	-79.2	-82.1
Economic Depreciation	**43.6**	**50.9**	**57.0**	**62.9**	**68.0**	**62.2**

Source: SP AusNet, AER PTRM

8.3 SP AusNet's Response to the Matters Raised in the AER's Draft Decision

The AER commented that it has assessed SP AusNet's depreciation schedules and considers that the methods and rates used are in accordance with clause 6A.6.3(b)(3), with the exception of the proposed economic life of vehicles. SP AusNet proposes to fully depreciate vehicles over three years, which is inconsistent with current industry practice. The AER considered that seven years

reflects the expected economic life of these types of assets and adjusted SP AusNet's depreciation schedules accordingly.

The AER also required revisions to the remaining economic and tax lives of non-contestable assets that SP AusNet proposes to roll into its RAB, as outlined in table 8.4 of the Draft Decision. These adjustments followed the review by Nuttall Consulting of the agreements relating to these assets and SP AusNet's associated calculations.

8.4 SP AusNet's Depreciation for this Revised Revenue Proposal

SP AusNet has implemented the AER's Draft Decision in relation to asset lives. Standard lives for the various asset classes for the future regulatory control period are shown in Table 8.4.1.

Table 8.4.1: Standard Lives for Assets for SP AusNet's revised Revenue Proposal

Asset Class	Standard Life	
	Original Proposal	Revised Proposal
System Assets		
Secondary	15	15
Switchgear	45	45
Transformers	45	45
Reactive	40	40
Lines	60	60
Establishment	45	45
Communications	15	15
Non System Assets		
Inventory	Not depreciated	Not depreciated
IT	5	5
Vehicles	3	7
Buildings	10	10
Other business support	10	10
Land	Not depreciated	Not depreciated
Easements	Not depreciated	Not depreciated

Source: SP AusNet

SP AusNet has also implemented the Draft Decision for the remaining lives for non-contestable assets.

It should be noted that the following depreciation allowance will vary from the Draft Decision as the Opening RAB, historic 2006/07 and 2007/08 capex and forecast capex numbers for the forthcoming period have been updated. The updated numbers are shown in Table 8.4.2.

Table 8.4.2: Depreciation 2008/09 to 2013/14 (Nominal $m) for SP AusNet's revised Revenue Proposal

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Depreciation	109.3	118.8	127.8	135.8	143.8	140.7
Indexation	-66.2	-69.3	-72.2	-75.0	-77.9	-81.4
Revised Proposal	**43.1**	**49.5**	**55.6**	**60.8**	**65.9**	**59.3**
Original Proposal	43.6	50.9	57.0	62.9	68.0	62.2

Source: SP AusNet, Revised PTRM

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

9 Capital Financing and Taxation

9.1 Introduction

The importance of the rate of return for a capital-intensive business with long-lived assets underscores the need for a conservative approach where there is uncertainty surrounding the estimation of the rate of return. Without the capacity to earn a market return on funds invested in the business, a regulated entity will struggle to attract sufficient capital to invest in, operate and maintain its network. In the longer term, consumers' interests are protected by ensuring adequacy and consistency in the rate of return available to investors in Australian energy infrastructure.

SP AusNet notes that there is a substantial body of regulatory precedent in relation to the rate of return applied to Australian infrastructure assets. Importantly, this has been reflected in the methodology and parameters for this review, which are now fixed in Chapter 6 of the NER.

Accordingly, SP AusNet has used the specific WACC parameter values set out in the NER for the purposes of its revised Revenue Proposal. Nonetheless, to finalise the WACC calculation a number of further variables must be estimated. Against this background, the remainder of this Chapter is structured as follows:

- Section 9.2 sets out details of SP AusNet's estimate of the Weighted Average Cost of Capital (WACC) as presented in SP AusNet's original Revenue Proposal.
- Section 9.3 provides details of the net tax allowance as presented in SP AusNet's original Revenue Proposal.
- Section 9.4 addresses the matters raised in the Draft Decision; and
- Section 9.5 sets out SP AusNet's capital financing and taxation for this revised Revenue Proposal.

Interested parties should be aware that SP AusNet submitted supplementary information in relation to capital financing and taxation to the AER on 30 April 2007. The information supplements that contained in SP AusNet's original Revenue Proposal, and was submitted in response to a request issued by the AER pursuant to clause 6A.11.1 of the NER. For ease of reference, this supplementary information is set out in Appendix H. Supplementary information relating to capital financing and taxation is provided in section 1.11 of Appendix H.

9.2 Estimate of the Vanilla WACC Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that for the purpose of setting a revenue cap for SP AusNet's prescribed services, a Vanilla WACC needs to be estimated that represents an efficient benchmark for a transmission company in the same operating and regulatory context providing only the prescribed services on a stand-alone basis. As noted above, clause 6A.6.2 sets out that the post-tax nominal vanilla Weighted Average Cost of Capital (WACC) is to be estimated in accordance with the following formula:

$$WACC = k_E \frac{E}{V} + k_D \frac{D}{V}$$

where:

- k_E is the nominal return on equity; (determined using the Capital Asset Pricing Model) and is calculated as:

  $r_f + \beta_e$ x MRP

  where:

  r_f is the nominal risk free rate for the regulatory control period;

  β_e is the equity beta; and

  MRP is the market risk premium;

- k_D is the nominal return on debt and is calculated as:

  r_f + DRP

  where:

  DRP is the debt risk premium for the regulatory control period.

- $\frac{E}{V}$ is the equity share in total value (equal to 1 - $\frac{D}{V}$);

- $\frac{D}{V}$ is the debt share in total value.

Clause 6A.6.2 also 'locks in' the following parameter values:

- benchmark gearing ($\frac{D}{V}$) is set at 60 percent;
- the market risk premium (MRP) is 6 percent;
- the equity beta (β_e) is 1.0; and
- the benchmark credit rating used to estimate the debt risk premium is BBB+.

SP AusNet's original Revenue Proposal explained that the establishment of the above parameter values in the NER therefore requires SP AusNet to estimate the following remaining WACC parameters:

- the nominal risk free rate;
- forecast inflation; and
- the debt margin.

- Each of these parameters is addressed in turn below, with reference to the information provided by SP AusNet in its original Revenue Proposal.

9.2.1 Risk Free Rate Submitted by SP AusNet in its Original Revenue Proposal

The risk free rate represents the rate of return on an asset with zero default risk. In estimating the WACC, it is a component of both the cost of equity and cost of debt.

In accordance with clause 6A.6.2 (c) of the NER, the annualised yield on the 10-year government bond is used as the appropriate proxy for the risk free rate. The proxy for a real risk free rate will be an interpolation of inflation-indexed government bond rates.

These values are subject to change – depending on capital market conditions - in the period between now and the time at which the AER makes its Final Decision on the revenue cap. For the purpose of determining the risk free rate to apply in the Final Decision, SP AusNet nominates a 10-day averaging period, between dates to be agreed with the AER in accordance with provisions set out in clause 6A.6.2(c)(2)(i).

SP AusNet's original Revenue Proposal adopted values of 5.70 percent for nominal risk free rate and 2.60 percent for the real risk free rate.

9.2.2 Forecast Inflation Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that it expected the AER to derive an inflation rate from the difference between nominal and indexed bond yields over the period corresponding to the revenue control period. Consistent with this approach, initially SP AusNet derived an inflation rate forecast of 3.02 percent for the period 2008 / 09 to 2013 / 14.

SP AusNet subsequently modified its proposal in respect of forecast inflation, to incorporate the recommendations of a report from NERA, which was provided to the AER as a supplementary submission following SP AusNet's submission of its original Revenue Proposal. A copy of the NERA paper is provided at Appendix P. SP AusNet's modified original proposal was for forecast inflation to be calculated as the difference between nominal CGS and indexed CGS, adjusted upwards by 20 basis points, and calculated using the Fisher equation.

9.2.3 Debt Margin Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal explained that in determining the WACC for a regulated entity, the cost of debt is estimated by adding a debt margin to the risk free rate. Clause 6A.6.2 (e) of the NER defines the debt margin as the margin between the 10-year Commonwealth annualised bond rate and the observed annualised Australian benchmark corporate bond rate for corporate bonds which have a BBB+ credit rating from Standard and Poors and a maturity of 10 years.

The debt margin observed represents the credit risk only and does not compensate the business for costs related to debt raising activities. These other costs are addressed as part of the opex proposal outlined in Chapter 6.

SP AusNet's original Revenue Proposal further noted that the AER's standard practice for estimating the debt margin has been to use observations sourced from the CBA Spectrum database. As has been well documented in previous regulatory decisions, a report produced by NERA indicates that the credit spread data provided by CBA Spectrum is understated by approximately 25.6 basis points for long dated bonds.

The AER responded to the concerns expressed in previous regulatory decisions in its Directlink Final Decision in 2006 by using data sourced from Bloomberg as an alternative.

In its original Revenue Proposal, therefore, SP AusNet used 125 basis points as the debt margin, being the observed average over the twenty trading days between 30 October 2006 and 24 November 2006 of:

- the adjusted yield for a 10 year BBB+ bond of 136 basis points (sourced from CBA Spectrum data adjusted for the downward bias by 25.6 basis points); and
- the yield for 10 year BBB bond of 115 basis points (sourced from Bloomberg).

9.2.4 Summary of WACC parameters Submitted by SP AusNet in its Original Revenue Proposal

SP AusNet's original Revenue Proposal calculated a post tax nominal vanilla WACC of 8.85 percent in accordance with the requirements of the NER and AER guidelines.

The key parameters and variables underlying the cost of capital calculation are summarised in Table 9.2.1.

Table 9.2.1 Proposed WACC parameters and variables Submitted by SP AusNet in its Original Revenue Proposal

Parameter/Variable/Outcome	Proposed value
Parameters	
Gearing (D/V)	60%
Market risk premium	6.00%
Equity beta	1
Credit rating	BBB+
Gamma	0.5
Variables	
Risk free rate – nominal 10 year government bond	5.70%
Real risk free rate – indexed 10 year government bond	2.60%
Debt margin	125 bp
Outcomes	
Expected inflation[1]	3.02%
Nominal cost of debt	7.06%
Post-tax nominal cost equity	11.70%
Vanilla WACC (as at time of lodgement)	**8.85%**

^ Calculated via the Fisher Equation from the risk free rate and the real risk free rate.
Source: SP AusNet

9.3 Net Tax Allowance Submitted by SP AusNet in its Original Revenue Proposal

As part of the post-tax nominal approach, a separate (cash flow) allowance has to be made in the revenue cap for corporate income tax, net of the value ascribed to dividend imputation credits. SP AusNet's original Revenue Proposal explained that clause 6A.64 of the NER sets out the methodology for calculating the allowance for corporate income tax in accordance with the following formula:

$$ETC_t = (ETI_t \times r_t)(1 - \Upsilon)$$

where:

- ETI_t is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of prescribed transmission services if such an entity, rather than the Transmission Network Service Provider, operated the business of the Transmission Network Service Provider, such estimate being determined in accordance with the post-tax revenue model;
- r_t is the expected statutory income tax rate for that regulatory year as determined by the AER; and
- Υ is the assumed utilisation of imputation credits, which is deemed to be 0.5.

SP AusNet's original Revenue Proposal explained that SP AusNet rolled forward its benchmark tax depreciation position established in the 2002 ACCC Final Decision in relation to assets providing prescribed services as required under the AER post-tax revenue model. Since this date the Australian Tax Office has changed the standard tax lives for various asset classes used to establish depreciation for tax purposes. Therefore, for assets rolling into the tax base from the start of the new regulatory period tax lives have been set equal to tax life specified by the Australian Tax Office for the category of assets.

Based on current forecasts of bond rates and inflation, in its original Revenue Proposal SP AusNet's proposed net tax allowance for the regulatory period is as set out in Table 9.3.1. SP AusNet noted that this calculation would need to be updated by the AER prior to the Final Decision.

Table 9.3.1 Proposed net tax allowance, 2008/09 to 2013/14 (nominal $m) Submitted by SP AusNet in its Original Revenue Proposal

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Income Tax Payable	27.3	28.8	30.0	30.8	31.7	29.8
Imputation Credit	-13.7	-14.4	-15.0	-15.4	-15.9	-14.9
Tax allowance	**13.7**	**14.4**	**15.0**	**15.4**	**15.9**	**14.9**

Source: SP AusNet PTRM

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

9.4 SP AusNet's Response to the Matters Raised in the AER's Draft Decision

9.4.1 Overview of the Draft Decision

The AER's Draft Decision accepted SP AusNet's estimation of the WACC for the purposes of its decision, but noted that it would be updated in accordance with the NER prior to the Final Decision. The Draft Decision set out the following three areas where SP AusNet's approach was not accepted:

- forecast inflation should be set at 3% for the forthcoming regulatory control period, notwithstanding the identified bias in indexed bond rates; and
- in relation to the debt margin:
  - *the sample period should be same as that used for the nominal bond rates; and*
  - *Bloomberg should be the sole source of data.*

SP AusNet's response to each of these matters raised in the Draft Decision is set out below.

9.4.2 Estimation of the inflation rate

As noted in section 9.2.2 SP AusNet proposed that adjusting the indexed CGS yield by 20 basis points then estimating inflation as the spread between the nominal CGS yield and (adjusted) indexed CGS yield, corrected an identified relative bias in the spread between nominal and indexed yields arsing from current market conditions.

In its Draft Decision, the AER has accepted the argument that the current method of forecasting inflation may not produce the best estimate of forecast inflation but has rejected SP AusNet's proposed approach. In relation to this matter the AER stated:

> The AER considers a more general approach to forecasting inflation is, at this time, appropriate and likely to result in the best estimate of expected inflation. A general approach to estimate expected inflation involves consideration of the RBA's inflation range, which lies between 2% and 3% and considering a range of inflation indicators to determine an inflation forecast, with the most sensible outcomes appearing to be either 2 %, 2.5 % or 3 %.
>
> The AER considers that, at present, and after considering a range of inflation indicators, applying this methodology favours an inflation forecast at the upper end of the RBA's target range, of 3 %, as opposed to the mid-point or lower end of the range (2% or 2.5%). (p. 120, Draft Decision)

SP AusNet believes there is merit in the AER's approach but that it is important that forecasts consider the best evidence and expertise available.

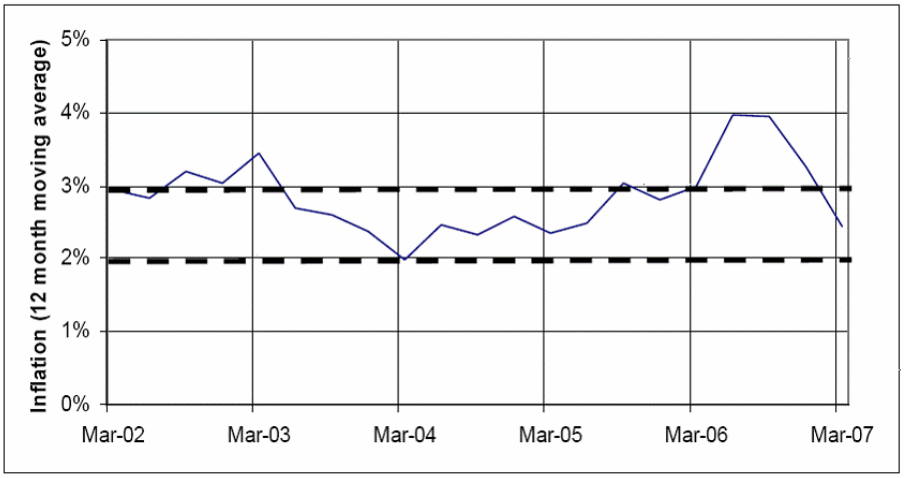
A key objective of the Reserve Bank is to use monetary policy to manage consumer price inflation within the target range of between 2% and 3%. The performance of the RBA in this regard has been excellent as CPI from March 1996[47] to March 2006 has averaged 2.1% (excluding GST impacted quarters).

SP AusNet is concerned that the AER's rationale for 3% forecast inflation is based on the following historical analysis of CPI:

[47] In 1996, the Governor and the Treasurer released the *Statement on the Conduct of Monetary Policy*, which stated the Government's support for the inflation target.

Chart 5.3 shows actual inflation over the last five years. As can be seen, inflation has rarely been as low as 2 %, tending more towards 2.5 %, 3 % or even over 3 %. Over the last five years, inflation has averaged 2.9 %, using a simple arithmetic average, or 3.1 %, using a compound average. Whilst this is a backward looking measure, it shows that in the past, a general approach predicting average inflation of 3% would have lead to a reasonable outcome, more accurate than a forecast of 2 % or 2.5 %. (pp. 120-1, Draft Decision)

Figure 5.3 Actual Inflation 2002-07 (CPI, Australia, All groups)



Source: ABS, AER analysis

As a matter of fact, using historic CPI to forecast future inflation is an unsound method. SP AusNet is not aware of any academic literature or respected forecasting agency that would adopt such a method. In any event, SP AusNet believes that the AER has miscalculated the compound inflation rate. The correct calculation of the compound inflation rate over the last 5 years (March 02 to March 07) is 2.6% not 3.1% as the AER states. A calculation supporting this contention has been supplied under separate cover to the AER.

SP AusNet's view is that it is appropriate to consider CPI forecasts from a number of independent forecasters. SP AusNet is concerned, in particular, that the AER has focused on BIS Shrapnel Report on the outlook of wages in the electricity, gas and water sector to 2012/13 as evidence supporting the choice of 3% as the appropriate inflation forecast. In the following tables SP AusNet provides forecasts from a broader range of sources. The private sector forecasts are attached as Appendix Q.

In light of this information, SP AusNet believes the weight of evidence suggests an inflation forecast at the midpoint of the RBA's stated target range of 2-3% is reasonable. Therefore, for the purposes of Clause 6A.6.2 of the NER, SP AusNet proposes the AER uses 2.5% as the **best** inflation forecast over the forthcoming regulatory control period, as required under Clause 6A.5.3 (b) (1).

Table 9.4.1: CPI forecasts from a range of independent forecasters

Year	Econtech report[1]	BIS[1]	SKM[1]	ABS	Access[2] (average)	Treasury[3] (May-07)	RBA[4] (underlying)	Mean
2005-06	3.2	3.2					2.75	3.2
2006-07	2.8	3.1		2.8	2.5		2.75	2.8
2007-08	2.3	3.0	2.5	2.5	2.8	2.5	2.5	2.6
2008-09	2.9	2.9	2.5	2.4	2.4	2.5	2.5	2.6
2009-10	3.0	2.3	2.5	2.0	2.0	2.5	2.5	2.5
2010-11	2.5	2.9	2.4	2.5	2.5	2.5	2.5	2.6
2011-12	2.2	3.2	2.6			2.5	2.5	2.6
2012-13	2.3	3.2	2.5			2.5	2.5	2.6
2013-14	2.3	na				2.5	2.5	2.4
2014-15	2.0	na				2.5	2.5	2.3
2015-16	2.2	na				2.5	2.5	2.4

Sources: 1. Table 7.1, page 4, "Labour Cost Growth Forecast", MM2 model, AER Econtech, August 2007.

2. KPMG - Federal Breakfast report, May 2007; Quote from Access - April 2007 report to the AER.

3. KPMG - Federal Breakfast report, May 2007.

4. CECG – Response to ESC expected inflation, August 2007.

Table 9.4.2: CPI forecasts from a range of independent private sector forecasters

	CBA[1]	ANZ[2]	NAB[3] (headline)	NAB[3] (underlying)	Westpac[4]	HSBC[5]	Mean
2007	2.5	3.0	2.0	2.7	2.3	2.7	2.5
2008	2.6	2.7	2.2	2.6	2.9	2.9	2.7
2009	2.5	3.1	2.5	2.5	2.5	2.5	2.6
2010	2.5	2.5	2.5	2.5	2.5	2.5	2.5
2011	2.5	2.5	2.5	2.5	2.5	2.5	2.5
2012	2.5	2.5	2.5	2.5	2.45	2.5	2.5
2013	2.5	2.5	2.5	2.5	2.45	2.5	2.5
2014	2.5	2.5	2.5	2.5	2.45	2.5	2.5
2015	2.5	2.5	2.5	2.5	2.45	2.5	2.5
2016	2.5	2.5	2.5	2.5	2.45	2.5	2.5

Sources: 1. Letter from Joseph Capurso, CBA, 20 September 2007.

2. Letter from Paul Perry, ANZ, September 2007.

3. Letter from David Holloway, NAB, 24 September 2007.

4. Letter from Craig Harris, Director Structured Derivatives, Westpac, 18 September 2007.

5. Letter from John Edwards, HSBC Chief Economist Australia and New Zealand, 18 September 2007.

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

9.4.3 Debt Margin

Sample period

The AER has stated that SP AusNet proposed to fix a different and outdated sample period to that used to sample the relevant bond rates. If SP AusNet's original Revenue Proposal left the AER with this impression, it was unintended. SP AusNet was simply providing the basis of its own calculations while acknowledging these numbers would be reset at the time of the Final Decision. Therefore, SP AusNet fully concurs with the AER's Draft Decision to align the sample period for bond rates and the debt margin.

Data source

Given the uncertainties outlined in the NERA report referenced in the AER's Draft Decision, SP AusNet believes the use of multiple sources for debt margin remains good regulatory practice. Therefore, SP AusNet would propose that when setting the debt margin for the Final Decision the AER use observations from both:

- the adjusted yield for a 10 year BBB+ bond sourced from CBA Spectrum data (adjusted for the identified downward bias by 25.6 basis points); and
- the yield for 10 year BBB bond sourced from Bloomberg.

9.5 SP AusNet's Financing and Tax Costs for this Revised Revenue Proposal

In the Final Decision, SP AusNet believes that the AER should adopt a CPI forecast of 2.5% for the reasons outlined in section 9.4.1 of this revised Revenue Proposal. In addition, in setting the debt margin, the AER should have regard to:

- the adjusted yield for a 10 year BBB+ bond sourced from CBA Spectrum data (adjusted for the identified downward bias by 25.6 basis points); and
- the yield for 10 year BBB bond sourced from Bloomberg.

In light of the Draft Decision, the WACC calculation for this revised Revenue Proposal is unchanged from the original Revenue Proposal.

Given the assumptions contained in the revised Revenue Proposal, SP AusNet's proposed net tax allowance for the regulatory period is as set out in Table 9.5.1. This information will need to be updated by the AER prior to the Final Decision.

Table 9.5.1: Revised net tax allowance, 2008/09 to 2013/14 (nominal $m)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Income Tax Payable	26.9	28.3	29.5	30.0	30.8	28.7
Imputation Credit	-13.5	-14.2	-14.7	-15.0	-15.4	-14.3
Revised Proposal	**13.5**	**14.2**	**14.7**	**15.0**	**15.4**	**14.3**
Original Proposal	13.7	14.4	15.0	15.4	15.9	14.9

Source: SP AusNet.

10 Operating Expenditure Efficiency Mechanisms

10.1 Introduction

SP AusNet operates its electricity transmission business so as to seek out and achieve cost-efficiencies while:

- ensuring that all standards and compliance obligations are met; and
- continuing to deliver a standard of service and network reliability that meets or exceeds customers' expectations.

A key driver of SP AusNet's performance has been the understanding that the revenue capping arrangements would provide for an explicit incentive payment in relation to the efficiency gains made over the period 2003 to 2007 / 08.

The remainder of this chapter is structured as follows:

- Section 10.2 reprises the information presented in SP AusNet's original Revenue Proposal regarding the glide-path amount sought by it in relation to operating expenditure efficiency gains achieved in the current regulatory period; and
- Section 10.3 provides an overview of the AER's Draft Decision, which accepted the glide path amounts proposed in SP AusNet's original Revenue Proposal.

10.2 Operating Expenditure Efficiency Savings and calculation of glide path amounts

SP AusNet's original Revenue Proposal noted the company's expectation that opex efficiencies achieved during the current regulatory control period would be subject to a glide-path over the next regulatory period as outlined in the 1999 Draft Statement of Regulatory Principles (DRP). Statement S7.2 on page 97 of the DRP states:

> "Benefits will be glide pathed for a five year period commencing at the start of each regulatory review.
>
> The Commission will make the following adjustments at the end of each regulatory period, to apply in the next regulatory period:
>
> … • Operations and maintenance expenditure – straight line glide path over the next regulatory period; …"

A more detailed description of the mechanism is provided in background discussions on pages 90-91 of the DRP (1999), which states:

> "This form of glide path allows for the gradual sharing of the benefits of efficiency gains between users and the TNSP in the form of lower prices. Further, for reasons of simplicity the glide path will be a simple straight-line phase out of efficiency gains. That is, for a regulatory period of five years, efficiency gains beyond the X factor would reduce at a rate of 20 percent per year. Thus, the TNSP will keep 100 percent of excess efficiency gains for the first year of the next regulatory period, 80 percent of the excess efficiency gains for the second year, and so on, until all of the excess efficiency gains are phased out by the end of the regulatory period."

For the purpose of determining the efficiency gains made by SP AusNet over the current regulatory period, a comparison between the opex benchmark contained in the ACCC's 2002 decision which excludes;

- easement land tax;
- self-insurance;
- rebates;
- equity and debt raising costs; and
- the glide path of efficiency gains from opex and capex from the previous regulatory period;

The company's actual expenditure, which has excluded the same items, is shown in Table 10.2.1. This ensures that the glide path has been determined from a like-by-like comparison.

Table 10.2.1: Opex comparison (Real 2007/08 $m) presented in SP AusNet's original Revenue Proposal

Year	2003^	2003/04	2004/05	2005/06	2006/07*	2007/08*
Decision (CPI adjusted)	20.6	69.3	70.3	69.7	70.3	71.2
Actual	17.8	61.8	62.1	63.7	60.2	61.7
Difference	**2.8**	**7.5**	**8.3**	**6.0**	**10.0**	**9.4**

^ Stub period from 1 January to 31 March 2003

** Forecast.*

Source: SP AusNet

On the basis of the above data and analysis, SP AusNet's original Revenue Proposal sought a glide path on the generated NPV, which amounts to $22.20 million over the period. This is calculated in Table 10.2.2.

Table 10.2.2: Glidepath of opex efficiencies (Real 2007/08 $m) presented in SP AusNet's original Revenue Proposal

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Glide Path	8.4	6.7	5.0	3.4	1.7	0.0

Source: SP AusNet

SP AusNet's original Revenue Proposal noted that the company's performance demonstrates that it will respond to incentive payments and seek cost-efficiencies while also ensuring its obligations are met and continuing to deliver a standard of service that meets or exceeds customers' expectations.

10.3 Overview of the Draft Decision and SP AusNet's response

Page 222 of the Draft Decision states:

> "The AER considers that SP AusNet's proposed glide path amounts have been calculated in accordance with the DRP...
>
> The opex underspends reported by SP AusNet indicate that the incentive arrangements outlined in the DRP that applied over the 2003-08 regulatory control period were effective. The AER notes that actual

expenditures for several opex items, including labour, corporate and routine maintenance costs, have been used as a basis for formulating and assessing SP AusNet's forecasts for the 2008-14 period."

SP AusNet welcomes the AER's Draft Decision in relation to this matter.

As noted in section 6.10.3 of this revised Revenue Proposal, SP AusNet proposes to re-calculate the glidepath, to take account of the additional savings that are expected to be associated with the new NW contract in 2007/08. This results in a modest increase in the glidepath amounts. Importantly however, as noted in section 6.10, SP AusNet has also reduced its opex forecast for the next regulatory period to take account of the savings that are now expected to be delivered by the new NW contract. The revised operating expenditure data and glidepath amounts are set out in Tables 10.3.1 and 10.3.2 below.

Table 10.3.1: Opex comparison (Real 2007/08 $m) for the revised Revenue Proposal

Year	2003^	2003/04	2004/05	2005/06	2006/07	2007/08*
Decision (CPI adjusted)	20.6	69.3	70.3	69.7	70.3	71.2
Actual	17.8	61.8	62.1	63.7	60.6	61.1
Revised Proposal	**2.8**	**7.5**	**8.3**	**6.0**	**9.7**	**10.0**
Original Proposal	2.8	7.5	8.3	6.0	10.0	9.4

^ Stub period from 1 January to 31 March 2003

** Forecast.*

Source: SP AusNet

Table 10.3.2: Glidepath of opex efficiencies (Real 2007/08 $m) for the revised Revenue Proposal

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Revised Glide Path	**8.4**	**6.7**	**5.1**	**3.4**	**1.7**	**0.0**
Original Glide Path	8.4	6.7	5.0	3.4	1.7	0.0

Source: SP AusNet

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

11 Total Revenue and Average Price Path for this revised Revenue Proposal

11.1 Introduction

SP AusNet's revised Revenue Proposal is based on the post tax building block approach outlined in Chapter 6 of the NER and the AER Guidelines and post tax revenue model. The components of the building block have been amended to take account of the matters raised in the AER's Draft Decision, as described in the preceding chapters.

The building block formula to be applied in each year of the revenue control period is:

MAR = return on capital + return of capital + Opex + Tax

= (WACC x RAB) + D + Opex + Tax

where:

MAR = Maximum allowable revenue

WACC = post tax nominal weighted average cost of capital

RAB = Regulatory Asset Base

D = economic depreciation (nominal depreciation – indexation of the RAB)

Opex = operating and maintenance expenditure + efficiency glidepath payments

Tax = regulated business income tax allowance

This revenue is then smoothed with an X factor that meets the requirements of Clause 6A.6.8 of the NER. A brief summary of the building blocks, the raw revenue and smoothed revenue is outlined in this chapter.

11.2 Asset Base Roll Forward to 2013 / 14 for this revised Revenue Proposal

The movements in the RAB over the 2008 / 09 to 2012 / 13 regulatory period are set out in Table 11.2.1. These incorporate the capital expenditure plan from Chapter 5 and the expected depreciation over the period from Chapter 8.

Table 11.2.1: Asset Base Roll-Forward from 1 April 2008 to 31 March 2014 (Nominal $m)

Period starting	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Opening Asset Base	2190.8	2292.7	2389.7	2482.7	2579.5	2693.5
New Assets (Net Capex)	145.0	146.5	148.6	157.6	179.9	207.2
Indexation	66.2	69.3	72.2	75.0	77.9	81.4
Depreciation	-109.3	-118.8	-127.8	-135.8	-143.8	-140.7
Closing Asset Base	2292.7	2389.7	2482.7	2579.5	2693.5	2841.3
RAB for return purposes	**2190.8**	**2292.7**	**2389.7**	**2482.7**	**2579.5**	**2693.5**

Source: SP AusNet PTRM

NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

11.3 Return on Capital for this revised Revenue Proposal

The WACC calculation is detailed in Chapter 9. The return on capital has been calculated by applying the post tax nominal vanilla WACC to the opening regulatory asset base consistent with the AER post tax revenue model. This calculation is shown in Table 11.3.1.

Table 11.3.1: Return on Capital from 1 April 2008 to 31 March 2014 (Nominal $m)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
RAB for return purposes	2,190.8	2,292.7	2,389.7	2,482.7	2,579.5	2,693.5
WACC	8.85%					
Revised Return on Capital	**193.9**	**202.9**	**211.5**	**219.7**	**228.3**	**238.4**
Original Return on Capital	196.7	205.6	214.5	223.3	232.0	240.6

Source: SP AusNet PTRM

11.4 Depreciation for this revised Revenue Proposal

The calculation of depreciation is detailed in Chapter 8. The AER post tax revenue model calculates economic depreciation by subtracting the indexation of the opening asset base from the depreciation for each regulatory year. A summary of this calculation is shown in Table 11.4.1.

Table 11.4.1: Depreciation from 1 April 2008 to 31 March 2014 (Nominal $m)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Depreciation	109.3	118.8	127.8	135.8	143.8	140.7
Indexation	-66.2	-69.3	-72.2	-75.0	-77.9	-81.4
Revised Economic Depreciation	**43.1**	**49.5**	**55.6**	**60.8**	**65.9**	**59.3**
Original Economic Depreciation	43.6	50.9	57.0	62.9	68.0	62.2

Source: SP AusNet PTRM

11.5 Operating and Maintenance Expenditure for this revised Revenue Proposal

The calculation of operating and maintenance costs is detailed in Chapter 6. The total opex including debt and equity raising costs, rebates, easement tax and other allowances are shown in Table 11.5.1.

Table 11.5.1 Operating expenditure from 1 April 2008 to 31 March 2014 (Nominal $m)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Opex Costs	68.5	72.0	76.2	79.4	83.3	86.7
Self-insurance	2.6	2.7	2.8	2.8	2.9	3.0
Easements Land Tax	78.4	89.3	89.3	101.6	101.6	115.6
Rebates	3.6	3.7	3.8	4.0	4.1	4.2
Debt Raising costs	1.1	1.2	1.2	1.3	1.3	1.4
Equity Raising costs	1.8	1.7	1.7	1.7	1.7	1.7
Glidepath	8.7	7.1	5.5	3.8	2.0	0.0
Revised Total	**164.8**	**177.7**	**180.5**	**194.5**	**196.9**	**212.6**
Original Total	174.7	184.3	194.3	203.7	213.6	224.1

Source: SP AusNet PTRM

11.6 Income Tax Payable for this revised Revenue Proposal

The income tax payable calculation is detailed in Chapter 9. The estimated tax allowance is shown in Table 11.6.

Table 11.6 Tax allowance from 1 April 2008 to 31 March 2014 (Nominal $m)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Income Tax Payable	26.9	28.3	29.5	30.0	30.8	28.7
Imputation Credit	-13.5	-14.2	-14.7	-15.0	-15.4	-14.3
Revised Tax allowance	**13.5**	**14.2**	**14.7**	**15.0**	**15.4**	**14.3**
Original Tax allowance	13.7	14.4	15.0	15.4	15.9	14.9

Source: SP AusNet PTRM

11.7 Raw Revenue Requirement for this revised Revenue Proposal

The raw revenue requirement for each year of the period is calculated as the sum of return on capital, regulatory depreciation, operating and maintenance expenditure, efficiency carry-over and net tax allowance. The outcomes are presented in Table 11.7.1.

Table 11.7.1: Raw revenue requirement, 2008/09 to 2013/14 (Nominal $m)

	Financial years ending 31 March					
	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Return on Capital	193.9	202.9	211.5	219.7	228.3	238.4
Economic Depreciation	43.1	49.5	55.6	60.8	65.9	59.3
Operating and Maintenance	77.6	81.3	85.7	89.1	93.3	96.9
Easement Land Tax	78.4	89.3	89.3	101.6	101.6	115.6
Glidepath	8.7	7.1	5.5	3.8	2.0	0.0
Net Tax Allowance	13.5	14.2	14.7	15.0	15.4	14.3
Revised Raw revenue requirement	**415.2**	**444.3**	**462.3**	**490.0**	**506.4**	**524.6**
Original Raw revenue requirement	428.7	455.1	480.7	505.3	529.5	541.9

Source: SP AusNet PTRM

11.8 Smoothed Revenue Requirement for this revised Revenue Proposal

While the raw revenue requirement is already comparatively smooth, it still needs to be converted to a CPI - X format in order for the revenue cap to be implemented. The revenue cap proposed is:

- for the financial year ending 31 March 2009, $414.0 million (nominal); and
- for the financial years ending 31 March 2010 to 2014, escalating according to a constant X factor of – 2.35 percent.

The smoothing approach chosen smooths the revenue with the previous period for both SP AusNet and customers and satisfies the requirements of the NER in that it meets the following criteria:

- the revenue in the last year (2013 / 14) is within 3 percent of the Building Block Revenue (in 2013 / 14, as per NER clause 6A.6.8);
- the P_0 and X-factors are constant in each year; and
- the total building block revenue and the total smoothed revenue for the regulatory control period must be equal in NPV terms.

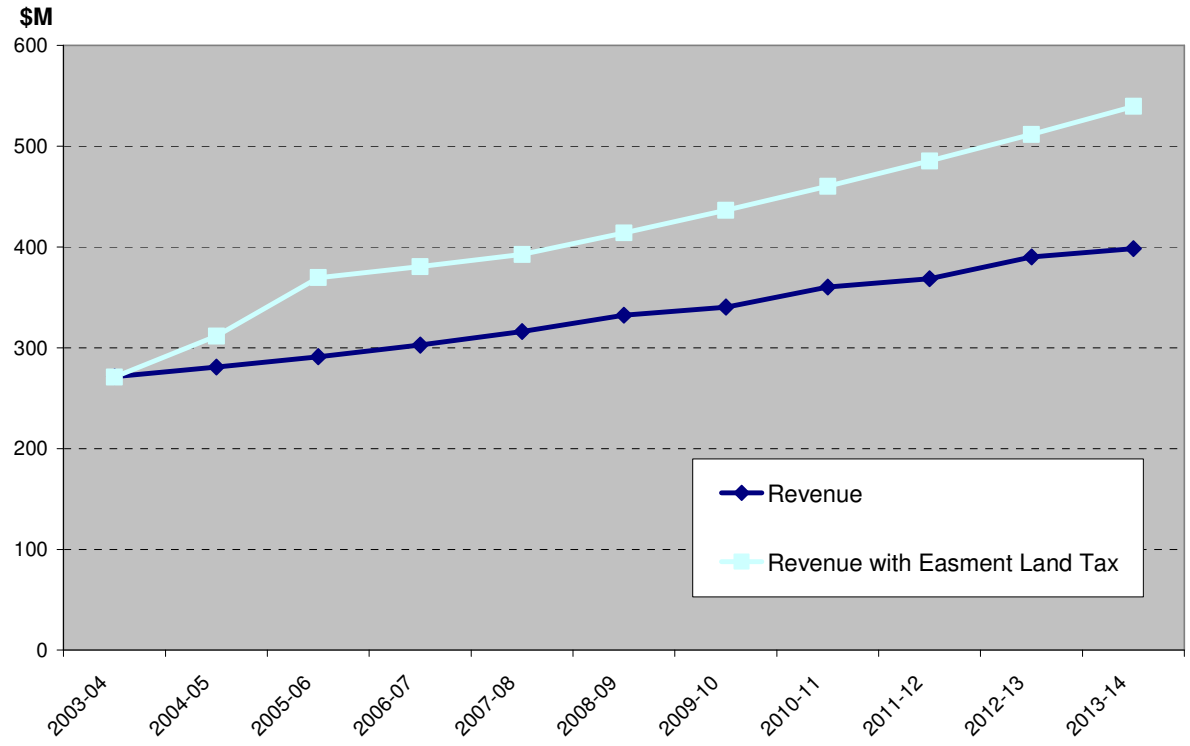
As would be expected, the smoothed revenue requirement is not significantly different from the raw revenue requirement (refer Table 11.8.1).

Table 11.8.1 Smoothed revenue requirement, 2008/09 to 2013/14 (Nominal $m)

	Financial years ending 31 March					
	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Raw revenue requirement	415.2	444.3	462.3	490.0	506.4	524.6
Smoothed revenue requirement	414.0	436.5	460.3	485.4	511.8	539.6
Difference	**1.2**	**7.8**	**2.0**	**4.7**	**-5.4**	**-15.1**

Source: SP AusNet PTRM

Figure 11.8 Smoothed revenue (nominal $m)



Source: SP AusNet

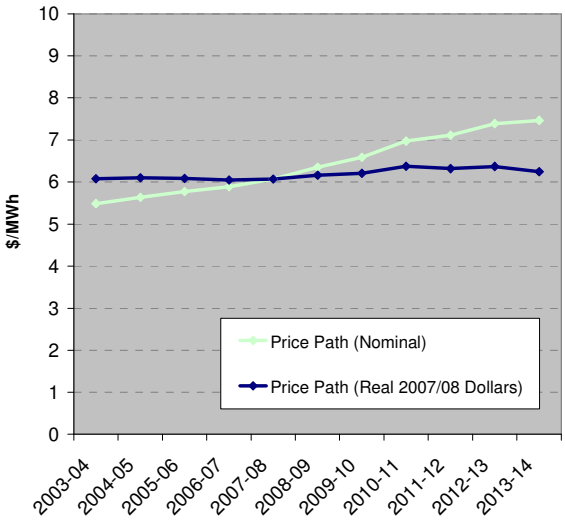
NOTE: NUMBERS IN TABLES MAY NOT ADD TO TOTAL DUE TO ROUNDING.

11.9 Average Price Path under the revised Proposed Revenue Cap

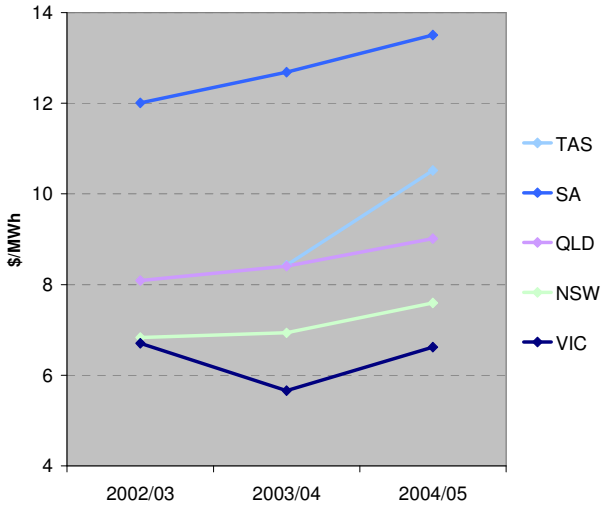
SP AusNet's unit charge for providing transmission services is currently the lowest in Australia. The revenue path proposed by SP AusNet will continue to deliver low transmission prices for Victoria and ensure that prices remain competitive with or lower than the transmission prices across the National Electricity Market (NEM).

Figure 11.9: Future Real Price Path

Forecast Transmission Price Path*



Transmission Charge 2002/03 to 2005/06



* Effects of the Victorian easement land tax and the roll-in of previously unregulated assets are excluded to allow a like-for-like comparison over time.

Source: SP AusNet, AER TNSP Comparison Reports.

12 Appendices

Appendix A – Jervis Consulting Report

A report on the Asset Risk Management Survey conducted for SP AusNet in July/August 2006 by Jervis Consulting.

Appendix B - VENCorp Availability Incentive Scheme

A more detailed explanation of the VENCorp Availability Incentive Scheme.

Appendix C – SKM Report

A report compiled by consulting engineers Sinclair Knight Merz on *Escalation Factors Affecting Capital Expenditure Forecasts* dated 21 February 2007.

Appendix D – Major Project List

A full list of projects incorporating the major additions to the non-contestable network and connection works such as interface and connection works at the Cranbourne Terminal Station and non-contestable work on the Snowy Interconnector Upgrade.

Appendix E – Asset Management Strategy

A report outlining the strategy for the management of the Victorian Electricity Transmission Network assets by SP AusNet.

Appendix F – BIS Schrapnel Report

A study on real increases in labour and materials costs by BIS Schrapnel, Business Research and Forecasting Consultants.

Appendix G – SAHA Report on the Valuation of Self-insurance (Confidential)

A quantitative report from SAHA International on the self-insurance requirements of SP AusNet's transmission business.

Appendix H – Additional Material

The SP AusNet Response to the Clause 6A.11.1 Information Request submitted on 30 Apr 2007.

Appendix I – Service Standards

Supporting information for the Revised Proposal STIPS targets and exclusions.

Appendix J – Capex: Cross Referencing Guide to Support Material

A cross referencing guide to the capex support material provided under separate cover to the AER with this Revised Proposal.

Appendix K – Presentation on Merger of Transmission and Distribution Businesses

A presentation on the effects of the merger of the transmission and distribution businesses on transmission opex costs.

Appendix L – Management Company Cost Analysis (Confidential)

Supporting information on the management company's actual costs and SP AusNet's accounting treatment of these costs.

Appendix M – 2007 Land Tax Assessment

Copies of the Victorian State Revenue Offices land tax assessments for 2007.

Appendix N – SAHA Response to Draft Decision on Self-insurance

A report responding to the issues raised by the AER and its consultants in the Draft Decision with respect to self-insurance costs.

Appendix O – ACG Letter on Equity Raising Costs

A letter outlining Allen Consulting Group's assessment of the AER's approach to equity raising costs in the Draft Decision.

Appendix P – NERA Paper

A Report on the bias in Indexed CGS Yields as a proxy for the CAPM Risk Free Rate.

Appendix Q – Private Sector Inflation Forecasts

A collection of letters providing inflation forecasts from private sector banks.