Powerlink has provided this document to the AER for public disclosure. Confidential information has been redacted.

Powerlink Queensland 2013 - 2017 Revenue Proposal

finity

Powerlink Queensland:
Actuarial Estimate of Retained Losses

March 2011

7 June 2011

Mr M Brennan
Chief Financial Officer
Powerlink Queensland
PO Box 1193
Virginia QLD 4014

Dear Maurie

Actuarial Estimate of Retained Losses: 2012/13 to 2016/17

We are pleased to enclose our report documenting our actuarial estimate of Powerlink Queensland's retained losses. This report has been prepared for the sole use of Powerlink. The main purpose of our advice is to assist Powerlink forecast the retained insurance losses for the five-year regulatory period commencing 1 July 2012.

We understand that our report may be made publicly available on the Australian Energy Regulator's website. Permission is hereby granted for such release. However, third parties should recognise that the furnishing of this report is not a substitute for their own due diligence and should place no reliance on this report or the data contained herein which would result in the creation of any duty or liability by Finity to the third party. Readers should also note that certain elements of the report have been redacted for confidentiality reasons. Hence in this context the report is not complete.

Please do not hesitate to contact either of us should you have any queries in relation to the report.

Yours sincerely

Mark Hurst

Adam Payne

Fellows of the Institute of Actuaries of Australia

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22 March 2011

Mr M Brennan
Chief Financial Officer
Powerlink Queensland
PO Box 1193
Virginia QLD 4014

Dear Maurie

Actuarial Estimate of Retained Losses: 2012/13 to 2016/17

In accordance with our proposal of 25 June 2010, we are pleased to enclose our report documenting our actuarial estimate of Powerlink Queensland's retained losses.

Please do not hesitate to contact either of us should you have any queries in relation to the report.

Yours sincerely

Mark Hurst

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Actuarial Estimate of Retained Losses

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Part I Executive Summary

1 Introduction

Finity Consulting Pty Limited (Finity) has been engaged by Powerlink Queensland (Powerlink) to provide advice in relation to their retained insurance losses.

The main purpose of our advice is to assist Powerlink forecast the retained insurance losses for the five-year regulatory period commencing 1 July 2012. We understand that our report will be provided to the Australian Energy Regulator (AER) as part of Powerlink's regulatory submission.

This is the second time we have provided advice of this nature to Powerlink. In March 2006 we provided Powerlink with a report titled *"Estimate of Uninsurable and Uninsured Losses"* which documented our estimate of the annual expected cost of self-insured, or retained insurance, losses for the regulatory period 2007/08 to 2011/12.

2 Scope

The scope of our review includes:

- understanding Powerlink's current insurance arrangements to identify insured and uninsured risks
- actuarial advice on the estimated annual cost of Powerlink's retained insurance losses, i.e.:
  - losses relating to insurable events up to Powerlink's insurance deductibles **(below-deductible losses)**
  - losses relating to insurable events above Powerlink's insurance limits **(above-limit losses)**
  - losses on uninsured risks **(uninsured-risks).**

3 Valuation Approach

The following diagram summarises the approach we have adopted for each category of loss for the property classes of insurance (which was identified as clearly having the largest retained costs). Losses were categorised into the following groups:

- Maintenance costs
- Below-deductible losses
- Inured losses
- Above-limit losses.

Figure 1 – Overview of approach

		Description	Approach
Network Property claims	Maintenance	Scheduled maintenance or unscheduled maintenance	No self-insurance allowance as costs in Operational Expenditure allowance (OpEx)
	Below-deductible	Events within scope of property insurance program. Losses capped at insurance deductible limits	Attritional loss model: - frequency x average claim size - % of asset values Analysis based on PowerLink's loss experience last 10 years and transmission line failures over last 50 years Self-insurance allowance included
	Insured	Events covered by property insurance program: - greater than deductible - up to insurance limits	No self-insurance allowance as covered by insurance
	Above limit	Events where losses exceed insurance limits	Frequency (i.e. return period) x towers / lines impacted x average cost of towers / lines Analysis based on external research and transmission line failures over last 50 years Scenario costing of individual extreme events No self-insurance allowance as recommend pass-through

Further comments relating to our approach include:

- Costs relating to scheduled maintenance and unscheduled were excluded from our analysis as these costs are included in Powerlink's operational expense submission.
- Our approach to estimating Powerlink's annual below-deductible losses is based on Powerlink's exposure (in terms of asset values) and Powerlink's ground-up loss experience since 2000/01 to December 2010. It is noted that a number of flood and cyclone loss events were experienced in early 2011 - these were not included in this evaluation.
- Losses are capped at the relevant insurance deductible limit under Powerlink's current insurance program. For losses relating to towers and lines we have also analysed the Australian transmission line experience since the 1960s.
- With Powerlink's property insurance program covering all assets (including towers and lines) there are no longer any significant uninsured property/asset risks. Hence the estimates in this report relate to below-deductible losses only (i.e. losses up to Powerlink's insurance deductibles).
- Our recommended approach for above insurance limit losses is to cover this risk as a "pass-through" arrangement rather than as a retained loss allowance.

Note that we have reviewed recent regulatory decisions in order to better understand the requirements of the AER and have endeavoured to address the key issues identified in that review by:

- Demonstrating the integrity of the data.
- Only including self-insurance estimates where there is data to support our estimates.
- Recommending that highly uncertain events be treated as pass-through.
- Avoiding double counting with operational expenditure allowances.

4 Below-deductible Losses

We have estimated Powerlink's retained costs for each of the insurance treaties in the current program. These are:

- Towers & Lines
- Property
- "Other" (includes property theft and damage and motor vehicle losses).

Powerlink has a separate liability insurance treaty, however no cost assessment was made for liability losses for reasons of materiality given PowerLink has a "no loss" history.

Our estimate of the annual cost of below-deductible losses for the next regulatory period is shown in Table 1 below.

Table 1 - Projected Annual Allowance for Below-deductible Losses ($000)

	2012/13	2013/14	2014/15	2015/16	2016/17	All Years
Towers & Lines						
Property						
Liability						
Other						
Total	**1,807**	**1,896**	**1,991**	**2,093**	**2,202**	**9,988**

Our estimate of total below-deductible losses over the next reset period is $10.0 million. While towers and lines losses are infrequent, they are relatively severe, leaving a share of the risk with Powerlink.

Property losses are more frequent, but less severe on average and subject to a lower deductible. However, the relative frequency of these events means that property losses contribute more than half of the value of the retained cost assessment.

5 Above Limit Losses

Above limit losses are the amounts above the limit of insurance on an insurance policy which the policy holder (Powerlink) is liable to pay.

Under the AER regulatory environment there are "pass-through" provisions which allow for specifically nominated costs to be passed through to customers after the revenue determination has been made.

For the primary classes of insurance (property and liability) Powerlink have various limits of insurance in place relative to the appropriate risk. Losses exceeding insured limits should be recommended to the AER to be treated as agreed pass-through events. We also recommend that Powerlink agree the threshold arrangements with the AER for the pass-through.

The limit of insurance for towers and lines insurance cover is [redacted]

We have estimated the cost of individual catastrophic event scenarios to assess whether the associated losses are likely to exceed Powerlink's insurance limits. In summary:

- We estimate that a cyclone exceeding 70 m/s would produce a ground-up loss to damage and lines [redacted], well in excess of Powerlink's limit [redacted] for towers and lines. Similarly, we estimate that the damage from an earthquake would produce a ground-up loss [redacted], which is also in excess of Powerlink's towers and lines limit. However, events of these magnitudes are only expected to occur with a relatively low probability.
- Expected losses from a severe thunderstorm or earthquake are expected to be within Powerlink's insurance limit for towers and lines and, therefore, subject to recovery from insurance.

Based on the estimated cost of extreme catastrophe events, together with their estimated frequency, Powerlink's new insurance arrangements and the AER's pass-through arrangements, we recommend that Powerlink request that "all" above limit losses are treated as pass-through events.

6 Results

Table 2 shows a summary of our estimated annual cost of losses relating to Powerlink's retained insurance risks.

Table 2 – Estimate of Retained Insurance Losses ($m)

	Below Deductible						
Year	Towers & Lines	Property	Liability	Other	Sub Total	Above Limit	Grand Total
2012/13					1.8	0.0	1.8
2013/14					1.9	0.0	1.9
2014/15					2.0	0.0	2.0
2015/16					2.1	0.0	2.1
2016/17					2.2	0.0	2.2
All Years					10.0	0.0	10.0

[1] Inflated by change in asset values

Our estimate of Powerlink's retained insurance losses for the next regulatory period commencing 2012/13 is $10.0 million. The whole of this estimate relates to below-deductible losses as we have recommended that above limit losses be treated as pass-through events.

Our estimate of the annual cost starts at $1.8 million for 2012/13 and grows to $2.2 million in 2016/17. The growth in our estimates reflects the projected growth in Powerlink's assets and the impact of inflation.

7 Reliances and Limitations

Our estimates are based on best estimate assumptions and represent our current assessment of the likely future experience of Powerlink. Although the estimates we have prepared are best estimates, deviations of the actual experience from our estimates are normal and to be expected.

The reader's attention is drawn to the reliances and limitation of our advice as set out in Section 1 of this report.

Part II Detailed Findings

1 Introduction and Scope

Finity Consulting Pty Limited (Finity) has been engaged by Powerlink Queensland (Powerlink) to provide advice in relation to their retained insurance losses.

The main purpose of our advice is to assist Powerlink forecast the retained insurance losses for the five-year regulatory period commencing 1 July 2012. We understand that our report will be provided to the Australian Energy Regulator (AER) as part of Powerlink's regulatory submission.

This is the second time we have provided advice of this nature to Powerlink. In March 2006 we provided Powerlink with a report titled *"Estimate of Uninsurable and Uninsured Losses"* which documented our estimate of the annual expected cost of self-insured, or retained insurance, losses for the regulatory period 2007/08 to 2011/12.

1.1 Background

Powerlink is a government-owned organisation that owns Queensland's high-voltage electricity transmission network. The network extends 1,700 km from the northern NSW border up to far-north Queensland. Powerlink's main activity is transportation of electricity on its high-voltage transmission network from generators to an electricity distribution network and major high voltage customers. The AER sets allowable maximum revenue for TNSPs for each 5 year regulatory period.

The key assets of the network are the transmission structures and lines and the substations. These assets are insured, with Powerlink holding levels of exposure both above and below the policy limits.

1.2 Scope

The scope of our review includes:

- Understanding Powerlink's current insurance arrangements to identify insured and uninsured risks
- Actuarial advice on the estimated annual cost of Powerlink's retained insurance losses, i.e.:
  - losses relating to insurable events up to Powerlink's insurance deductibles **(below-deductible losses)**
  - losses relating to insurable events above Powerlink's insurance limits **(above-limit losses)**
  - losses on uninsured risks **(uninsured-risks).**

1.3 Basis of Estimates

We have prepared our annual cost estimates of Powerlink's retained insurance losses on the basis that they:

- Are central estimates (i.e. intended to be the mean value of the range of possible outcomes).
- Include an allowance for the projected growth in the asset values of Powerlink's transmission line network and substations. The projected asset values were provided by Powerlink and appear consistent with the levels of growth observed in the past.
- Are not discounted for investment income – in other words no attempt has been made to express the expected costs over the five years on a "Net Present Value" basis.

Our estimates do not contain margins for expenses, reinsurance or profits and hence are likely to be lower than the equivalent commercial costs of insurance (if it was available).

1.4 Retained Insurance Losses vs Other Costs

The AER's revenue determination recognises TNSP's costs in the following categories:

- Operational Expenditure (OpEx), including:
  - maintenance costs
  - insurance premiums
- Retained insurance (or self-insurance) costs.

In addition, in some circumstances, Powerlink may be eligible for additional funding via "pass-through" arrangements (refer Section 5.2).

It is important in any claim to the AER that there is no double counting of these costs. We have endeavoured to achieve this by ensuring that costs allocated as being retained insurance losses only relate to losses that:

- are not recoverable via an insurance policy, and
- are not maintenance-related costs.

Ultimately, as the party with final responsibility for the regulatory submission, we have relied on Powerlink to ensure that there is no double counting of costs.

Note that our estimates of retained insurance losses also do not include losses relating to structural failure from poor construction or maintenance.

1.5 Structure of Report

The remainder of this report is structured as follows:

- Section 2 outlines the approach we have taken to estimate Powerlink's retained insurance losses
- Section 3 summarises Powerlink's insurance arrangements
- Section 4 sets out our valuation of below-deductible losses
- Section 5 sets out the above limit component of our review
- Section 6 summarises the results of our review
- Section 7 sets out the reliances and limitations associated with our advice.

The Appendices set out further details of our valuation.

1.6 Glossary of Terms

Abbreviations and terms used in this report are:

AER	Australian Energy Regulator
Above limit	Amounts above the limit of insurance on an insurance policy, which the policy holder (Powerlink) is liable to meet.
Below-deductible	Amounts below the deductible on an insurance policy, which the policy holder (Powerlink) is liable to pay.
BoM	Bureau of Meteorology
CPI	Consumer Price Index
Deductible	Also called the claims excess (or retention) on an insurance policy. The policy holder (Powerlink) is liable to meet amounts below this threshold.
Pass-through	Under the AER regulatory environment, there is a pass-through mechanism to allow revenue to be adjusted within the regulatory period for pre-defined circumstances and events.
Self-insurance	AER terminology for retained loss allowance in a revenue determination.
TNSP	Transmission Network Service Provider

2 Approach

In this section we describe the approach we have adopted to estimate Powerlink's retained insurance losses.

2.1 Review of Insurance Arrangements

The first step in our assessment was to understand Powerlink's current insurance arrangements to:

1. identify any uninsured risks where Powerlink would be liable for all losses, and
2. for risks which are insured, to understand the deductibles (i.e. retentions) and limits in order to determine the classes of insurance with significant retained costs.

A summary of the insurance arrangements is shown in Section 3.

2.2 Risks

Powerlink has, historically, been subject to losses from the following perils:

- storm damage (from thunderstorms, wind storms and cyclones)
- machinery breakdown
- theft of property
- damage to Powerlink motor vehicles and property
- damage to third party property.

There are also perils not listed above, for example, flood, credit risk, terrorism, war, invasion, nuclear risks and tsunami (or other action by the sea). There are no historical losses adopted in this report and, more importantly, no data on the exposure of the electricity transmission networks to these perils. *We have therefore not estimated or included a cost for such losses even though, in theory, the expected losses are greater than zero.*

We note that Queensland has suffered major flood and cyclone damage during January and February 2011, which also affected Powerlink assets. These events have not been factored into this report.

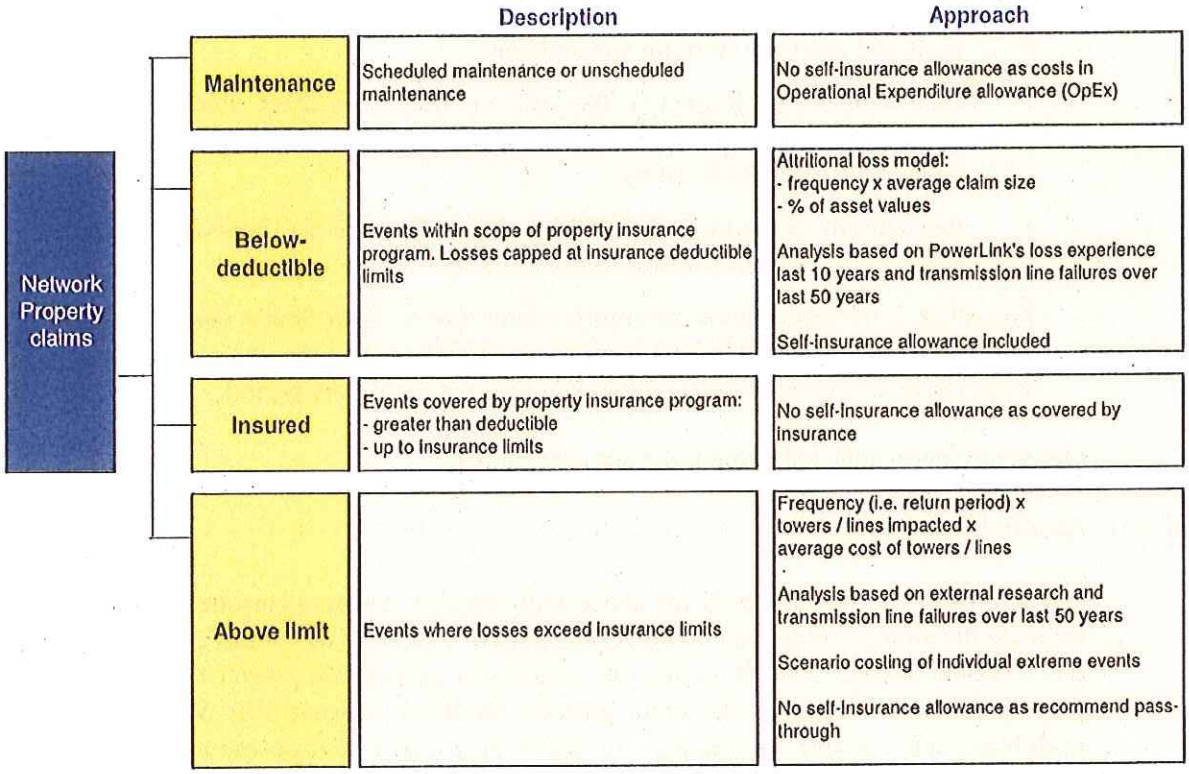
2.3 Overview of Approach

The following diagram summarises the approach we have adopted for each category of loss for the property classes of insurance (which was identified as clearly having the largest retained costs). Losses were categorised into the following groups:

- Maintenance costs
- Below-deductible losses
- Losses covered by insurance

- Above-limit losses.

Figure 2.1 – Overview of approach



Costs relating to scheduled maintenance, and unscheduled maintenance, were excluded from our analysis as these costs are included in Powerlink's operational expense submission.

With Powerlink's property insurance program covering all assets (including towers and lines), there are no longer any significant uninsured property/asset risks. We have assumed that all insured losses will be recoverable from Powerlink's insurers.

Further comments relating to our approach to estimating the below-deductible and above limit costs are discussed below.

The above approach is consistent with the approach adopted for our previous review except that, as we are not aware of any significant uninsured risks, there is no uninsured estimate.

2.4 Below-deductible Losses

Our approach to estimating Powerlink's annual below-deductible losses is based on Powerlink's exposure (in terms of asset values) and Powerlink's ground-up loss experience capped at the current insurance deductible. Specifically –

- Losses relating to towers and lines, and property (mainly substations) events are treated separately as they have different insurance deductibles. Our estimated retained insurance cost is equal to the product of:
  - projected asset values of towers and lines
  - an assumed loss frequency (per million dollars of asset values) based on Powerlink's experience over the last 10 years and Australian transmission line failures over the last 50 years
  - the current insurance deductibles from Powerlink's insurance program applying to each class of loss (refer Table 3.1)
- For other losses (i.e. motor insurance claims under Powerlink's commercial fleet policy and property theft losses), our estimates are based on the recent annual cost of these losses, escalated by price inflation to the next regulatory period.

Our below-deductible valuation is set out in Section 4.

2.5 Above Limit Losses

The approach we have adopted for above limit losses is to use a catastrophe model to estimate the amount of damage to Powerlink's network caused by certain extreme events (i.e. a cyclone greater than 70 metres per second, a thunderstorm greater than 54 metres per second and an earthquake of magnitude Modified Mercalli VII). We have then multiplied the amount of damage by the average cost of transmission lines and structures.

The frequency of extreme events was based on various sources of information:

- for cyclones, on modelling by natural hazard experts
- for thunderstorms, on the frequency of transmission line failures due to thunderstorms in Queensland over the past 50 years
- for earthquakes, on a 2005 risk assessment.

We have carried out our analysis on a ground-up basis to assess the annual average expected cost of catastrophes on the network. We have also estimated the cost of individual catastrophic events to assess whether the associated losses are likely to exceed Powerlink's insurance limits.

The Above Limit loss component is discussed in more detail in Section 5.

3 Current Insurance Arrangements

In this section we summarise Powerlink's current insurance arrangements.

For the purpose of estimating Powerlink's retained losses we have assumed that the current insurance arrangements will remain in place for the next regulatory period.

3.1 Summary of Insurance Arrangements

Table 3.1 contains a high level summary of Powerlink's 2010/11 insurance program. The most significant changes in the current insurance program since the last regulatory submission in 2006 are:

1. the placement of cover for towers and lines, which were previously uninsured;
2. the inclusion of an "all perils" property policy,

Table 3.1 – Summary of Powerlink's 2010/11 Insurance arrangements

Cover	Deductible ($m)	Policy Limit ($m)	Other Information
Towers & Lines Property Liability Professional Indemnity			

In addition, Powerlink has a separate commercial fleet motor vehicle policy, covering damage to insured vehicles and liability for personal injury and property damage.

3.2 Impact on Assessment of Retained Costs

The recent extensions of Powerlink's insurance program is material to this assessment as there are now no longer any significant uninsured risks. Below-deductible costs now represent the majority of Powerlink's retained insurance costs.

1

4 Valuation of Below-deductible Losses

In this section we set out our assessment of Powerlink's below-deductible insurance losses over the forthcoming regulatory period, covering the financial years from 2012/13 to 2016/17.

Powerlink's loss experience from 2005/06 to December 2010 (refer Appendix B), and for towers and lines the Australian transmission line failure experience since the 1960s, has been analysed to derive average loss and frequency assumptions. In carrying out this analysis historical losses have been capped at Powerlink's current insurance deductibles. Frequency assumptions are expressed relative to asset replacement values, which capture growth in Powerlink's exposure, as well as inflation, over time.

We have estimated Powerlink's retained costs for each of the major insurance treaties in the current program. These are:

- Towers & Lines
- Property
- Liability
- "Other" (Property theft & damage, motor vehicle losses etc).

4.1 Exposure

Table 4.1 (towers & lines) and Table 4.2 (substations) show historical asset values to June 2010 and the projected asset values for the 5 year reset submission period. Values are projected into the reset period based on historical average growth rates, together with discussions with Powerlink regarding expected growth rates going forward.

Table 4.1 - Historical and Projected Towers and Lines Asset Values

Year	Asset Values ($m)	Asset value Growth
2005/06	2,869	
2006/07	3,048	6%
2007/08	3,479	14%
2008/09	4,015	15%
2009/10	4,202	5%
2012/13	5,294	8.0%[1]
2013/14	5,717	
2014/15	6,175	
2015/16	6,669	
2016/17	7,202	

[1] The growth in asset values relates to both the increase in the amount and quality of Powerlink's infrastructure throughout Queensland, and price inflation.

Table 4.2 – Historical and Projected Substation Asset values

Year	Asset Values ($m)	Asset value Growth
2005/06	1,905	20%
2006/07	2,080	9%
2007/08	2,350	13%
2008/09	2,698	15%
2009/10	3,025	12%
2012/13	3,811	8.0%[1]
2013/14	4,115	
2014/15	4,445	
2015/16	4,800	
2016/17	5,184	

[1] The growth in asset values relates to both the increase in the amount and quality of Powerlink's infrastructure throughout Queensland, and price inflation.

Based on this information, we have assumed future growth rates of 8.0% p.a. for both towers & lines and for substations. The assumed rate of future growth in assets is somewhat lower than recent history would suggest and comprises a 2.5% p.a. long term inflation assumption and 5.5% p.a. "real" growth. .

4.2 Use of Data Sources

To obtain a complete picture of Powerlink's loss experience financial data has been assembled from multiple sources. These include:

1. Regulatory accounts (Self-insurance Report)
2. Extracts from Powerlink's operational databases

The assessment of below-deductible costs involves combining financial data from these data sources to capture the full cost of events that would fall within the scope of Powerlink's current self-insurance and insurance program. This experience was then used to set a frequency and average size for each type of event based on the appropriate deductible.

The below-deductible valuation does not capture costs that would be incurred above the policy limits in the current insurance program and losses allowed for by Powerlink's operational and maintenance expenditure.

4.3 Towers and Lines

For towers and lines we have derived our frequency and average loss assumptions by analysing Powerlink's own loss experience. We have also analysed the Australian tower failure experience over the last 50 years to assist, and to add further credence, to the frequency assumption.

Powerlink's Experience Since 2000/01 to December 2010

Table 4.3 below shows the historical frequency and cost of recent losses. Note that below-deductible costs are inflated to December 2010.

Table 4.3 – Powerlink's Towers & Lines Loss Experience

Year	Reported Number of Events	Total Cost	Below-deductible Cost (inf. Adjusted)
		$'000	$'000
2000/01			
2001/02			
2002/03			
2003/04			
2004/05			
2005/06			
2006/07			
2007/08			
2008/09			
2009/10			
All years	2	5,418	3,270

The two events during the last 10 years were:

1. *Cyclone Larry*:
2. *Dysart-Moranbah wind event*:

Both of the above events would now fall within the scope of Powerlink's towers and lines cover in the current insurance program, although no insurance protection was available at the time the events took place.

The average below-deductible loss is $1.635 million per event in December 2009 dollars (i.e. $3.27 million total inflated cost divided by 2 events).

Note that the analysis does not take into account the recent floods and cyclone events in Queensland during January and February 2011, which have resulted in damage to Powerlink's assets.

Longer Term Experience

Our analysis of the longer term experience is based on a national tower failure database, covering known loss incidents from the 1960s to December 2010.

A summary of the known transmission line failures in Queensland since the 1960s is shown in Table 4.4. The majority of failures were due to thunderstorms (including windstorms), a small number due to cyclones with no failures being due to earthquakes or floods (excluding the January and February 2011 events as noted previously).

Table 4.4 - Summary of Transmission Line Failures

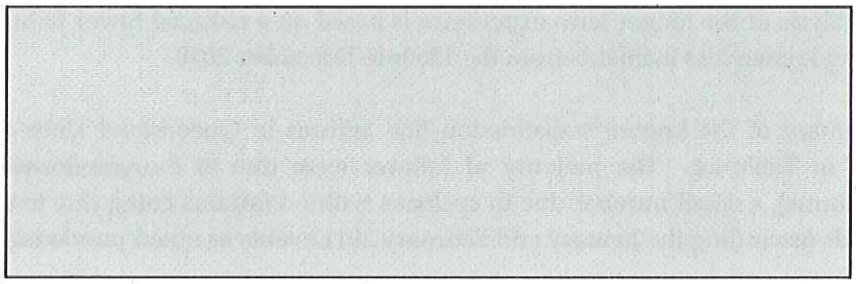
Decade	No. of events	Events per decade
1960-69	0	
1970-79	0	
1980-89	3	
1990-99	3	
2000-09	2	
All years	8	1.6
Last 30 years	8	2.7

The average number of known transmission failures per decade in Queensland over the last 50 years is 1.6 events per decade. However, the fact that there are no losses in the 1960s and 1970s may be due to incomplete records, as well as to changes in exposure over the same time. Hence the average of 2.7 events per decade recorded over the most recent 30 years is a better indication of the loss experience.

Over short timescales the impact of global climate change on weather patterns, and consequential loss experience, is dominated by local conditions and random climate variation. No adjustments have been made for changes in climatic conditions over the reset period as a result of global warming or other changes in climate.

Below-deductible Claims Cost

Based on Powerlink's recent claims experience (i.e. 2.0 events per decade over the last 10 years – refer Table 4.3) and the longer term Queensland wide experience (i.e. 2.7 events per decade over the last 30 years – refer Table 4.4), we have assumed 2.5 events per decade (i.e. 0.25 events per year) for the next regulatory period.

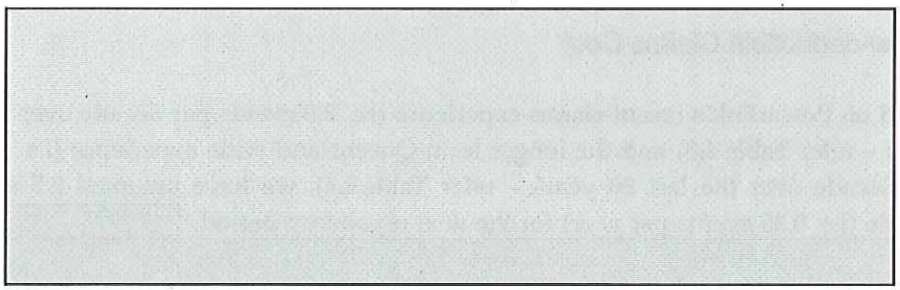


4.4 Property Losses

Table 4.6 shows the historical cost of property losses over the last 10 years, with frequency expressed per million dollars of substation asset values. Note that below-deductible costs are inflated to December 2010 values (up to the current policy deductible).

Table 4.6 - Property Loss Experience

Year	Reported Number of Losses	Frequency per $m assets	Total Cost	Below-deductible Cost (inf. Adjusted)
			$'000	$'000
2000/01				
2001/02				
2002/03				
2003/04				
2004/05				
2005/06				
2006/07				
2007/08				
2008/09				
2009/10				
All years	10	0.06%	11,988	4,419
Selected =>		Freq. 0.06%		Avg. Size 442



A total of ten events have been identified since 2000/01 that would fall within the scope of the current property insurance cover, with a combined gross cost of $12 million. These events include a range of matters. After capping losses [redacted] the retained cost reduces to $4.4 million (after allowing for inflation).

We have assumed a loss frequency of 0.06% losses per million dollars of asset values at an average cost of $442,000 per event. There are no clearly identifiable trends in the experience and hence our selections are based on the average experience over the last 10 years since 2000/01.

It should be noted that the above analysis does not take into account the recent flood and cyclone events in Queensland during January and February 2011, which has resulted in damage to Powerlink assets. We expect that our assumptions would increase with the inclusion of these events.

4.5 Liability

There is no direct claims experience on which to base an assessment of below-deductible liability costs for Powerlink. A typical approach in these circumstances would be to estimate retained costs based on benchmarks from other TNSPs. However, the low claim frequency and [redacted] imply that retained costs for liability claims are unlikely to be material. Hence, we have not estimated a retained claims cost allowance for liability claims.

4.6 Other Losses

In addition to below-deductible costs incurred under the primary insurance programs, deductibles for motor insurance claims under the commercial fleet policy, and the costs associated with minor property theft and minor third party property damage settlements, contribute to Powerlink's overall retained insurance cost.

Based on historical data (refer Appendix B) and the time period over which this data was collected, we have assessed an annual cost to Powerlink from Other losses of just under $300,000 in 2009/10 values.

Table 4.7 shows the annual below-deductible losses for these other losses projected over the reset period, assuming an average inflation rate of 2.5% per annum.

[redacted]

4.7 Projected below-deductible losses

Our estimate of the annual cost of below-deductible losses from towers and lines, property, liability and other losses is shown in Table 4.8 below.

Table 4.8 - Projected Annual Allowance of Below-deductible Losses ($000)

	2012/13	2013/14	2014/15	2015/16	2016/17	All Years
Towers & Lines						
Property						
Liability						
Other						
Total	**1,807**	**1,896**	**1,991**	**2,093**	**2,202**	**9,988**

Our estimate of total below-deductible losses over the next reset period is $10.0 million. While towers and lines losses are infrequent, they are relatively severe, leaving a large share of the risk with Powerlink (even with the current insurance in place).

Property losses are more frequent, but less severe on average. They are also subject to a lower deductible. However, the relative frequency of these events, and the expected growth in the value of the network, means that property losses contribute more than half of the value of the retained cost assessment.

As mentioned previously, the allowances above do not take into account Queensland's recent flood and cyclone events in January and February 2011 which have caused damage to Powerlink's assets.

5 Valuation of Above Limit Losses

This section sets out the above limit component of our assessment.

5.1 Introduction

As described in Section 2 the approach we have adopted for above limit losses is to:

- Use a catastrophe model to estimate the frequency of certain extreme events –
  - a cyclone greater than 70 metres per second
  - a thunderstorm greater than 54 metres per second
  - an earthquake of magnitude Modified Mercalli VII.
- Estimate the cost of damage to Powerlink's network by multiplying –
  - the number of towers and the length of transmission lines assumed to be damaged, by
  - the average cost of replacing transmission lines and structures (split between tension and suspension structures).

The frequency of extreme events was based on various sources of information:

- For cyclones, on modelling by natural hazard experts.
- For thunderstorms, on the frequency of transmission line failures due to thunderstorms in Queensland over the past 50 years.
- For earthquakes, on a 2005 risk assessment.

Note that these sources exclude the flood and cyclone events in Queensland in January and February 2011.

We have carried out our analysis on a ground-up basis to determined the component of the ground-up loss which exceeds Powerlink's insurance limits (shown in Table 3.1) for each extreme catastrophic event.

Note that it is possible that an individual event could be included in both below-deductible and above limit categories. However, by definition, there will be no double counting of costs.

Cyclone Losses

Based on our catastrophe modelling, we have assumed that a cyclone with winds greater than 70 m/s are likely to cause losses greater than Powerlink's current tower and lines insurance policy limit[redacted]

Other Extreme Events

We do expect that losses from other extreme events (thunderstorms and earthquake) should fall within Powerlink's current limit of insurance cover based on the assumptions adopted in our catastrophe model. That is not to say that events of this nature can not cause damage in excess of Powerlink's insurance limit[redacted], however, the likelihood of such events is low.

5.2 Pass-Through Events

Under the AER regulatory environment, there are "pass-through" provisions which allow for unanticipated material costs to be passed through to customers after the revenue determination has been made.

At this stage, to assess above limit losses, we have estimated the individual cost of specific extreme events. However, given that the regulatory methodology provides a mechanism for pass-through events, we recommend that this approach be adopted for all catastrophes where losses exceed Powerlink's insurance limits.

We believe that the pass-through option is an efficient way of dealing with extreme events which occur very infrequently and are extremely difficult to model. The alternative of receiving an annual allowance to be placed in a reserve is problematic as the reserve may need to be maintained, theoretically, for a significant period of time. There is also the possibility that an extreme event may occur well before the reserve has reached the expected size for the event.

5.3 Summary

We estimate that a cyclone exceeding 70 m/s would produce a ground-up loss cost well in excess of Powerlink's limit[redacted]for towers and lines. However, this type of event has a relatively low probability of occurring. It is also possible that a cyclone of lesser intensity could cause damage in excess of Powerlink's insurance limit of [redacted], however, we consider these events to be of a less frequent nature.

Similarly, we estimate that the damage from an earthquake would produce a ground-up loss in excess of Powerlink's limit of[redacted]for towers and lines. However, an event of this magnitude is also expected to be of a less frequent nature.

For thunderstorms, the expected ground-up claims cost for a storm with wind speed in excess of 54 m/s, is expected to be within Powerlink's current limit of insurance for towers and lines.

Based on the estimated cost of extreme catastrophe events, together with their likely frequency, Powerlink's current insurance arrangements and the AER's pass-through threshold guidelines, we recommend that Powerlink request that above limit losses are treated as pass-through events.

6 Results

In this section we summarise the results of our review.

6.1 Summary of Projected Costs

Table 6.1 shows a summary of our estimated annual cost of losses relating to Powerlink's retained insurance risks.

Table 6.1 – Estimate of Retained Insurance Losses ($m nominal)

	Below Deductible						
Year	Towers & Lines	Property	Liability	Other	Sub Total	Above Limit	Grand Total
2012/13					1.8	0.0	1.8
2013/14					1.9	0.0	1.9
2014/15					2.0	0.0	2.0
2015/16					2.1	0.0	2.1
2016/17					2.2	0.0	2.2
All Years					10.0	0.0	10.0

[1] Inflated by change in asset values

Our estimate of Powerlink's retained insurance losses for the next regulatory period commencing 2012/13 is $10.0 million. The whole of this estimate relates to below-deductible losses as we have recommended that above limit losses be treated as pass-through events.

Our estimate of the annual cost starts at $1.8 million for 2012/13 and grows to $2.2 million in 2016/17. The growth in our estimates reflects the projected growth in the replacement value of Powerlink's assets and inflation.

The estimates shown in Table 6.1 are central estimates (i.e. intended to be the mean or expected value of the liabilities), include an allowance for future growth in the value of Powerlink's transmission line network and substations (consistent with levels observed in the past) and are undiscounted. The above estimates do not contain margins for expenses, reinsurance or profits and hence are likely to be lower than the equivalent commercial cost of insurance (if it was available).

As noted previously the above analysis does not take into account the recent flood and cyclone events which have caused damage to Powerlink's assets.

7 Reliances and Limitations

We have relied on the accuracy and completeness of the data and other information (qualitative, quantitative, written and verbal) provided to us by Powerlink for the purpose of this advice. We have not independently verified or audited the data, but we have reviewed the information for general reasonableness and consistency. The reader of this report is relying on Powerlink and not Finity for the accuracy and reliability of the data. If any of the data or other information provided is inaccurate or incomplete, our advice may need to be revised and the report amended accordingly.

We have prepared our estimates on the basis that they represent our current assessment of the likely future experience of Powerlink. Sources of uncertainty include the limited number of past events on which to base our assumptions. Although the estimates we have prepared are best estimates, deviations of the actual experience from our estimates are normal and to be expected.

In estimating future retained insurance losses the result depends on a number of assumptions including the continuation of current insurance coverage and deductible levels and the treatment of the specified losses as retained insurance losses. These assumptions are subject to policy decisions by Powerlink, market forces and regulatory determination. Should there be any variation in these assumptions our results may change and should be reviewed and updated accordingly.

In making our estimates we have placed considerable reliance on the past experience of the portfolios. To the extent that estimates and assumptions are required there is a degree of uncertainty in the analysis particularly with the limited number of line failures and major substation losses. There are no margins included in our results to offset the potential impact of such uncertainty.

This report has been prepared for the sole use of Powerlink for the purpose stated in Section 1. It is not intended, nor necessarily suitable, for any other purpose. The report should be considered as a whole.

We understand that Powerlink may wish to provide a copy of the report to the Australian Energy Regulator on a "confidential" basis. Permission is hereby granted for such distribution on the condition that this entire report, rather than any excerpt, be distributed. No other use of, or reference to, this report should be made without prior written consent from Finity Consulting, nor should the whole or part of this report be disclosed to any other person.

Third parties, whether authorised or not to receive this report, should recognise that the furnishing of this report is not a substitute for their own due diligence and should place no reliance on this report or the data contained herein which would result in the creation of any duty or liability by Finity to the third party.

Part III Appendices

A Information Provided

A.1 Information used

For this assessment we used the following information.

Loss data

- Listing of Powerlink insurance-related losses for last 5 years up to December 2010
  - including description of loss, date of loss, event, insurance class, loss amounts
  - losses relate to towers and lines, substations and other assets
  - class of losses include property (including machinery breakdown), liability and theft
- Powerlink work order data
- Powerlink regulatory self-insurance report.

Insurance

- Powerlink Queensland Insurance Renewal
- Insurance policies for major insurances.

Research papers

- Systems Engineering Australia, 2002, *Power Transmission Systems Wind Risk Assessment Study*
- Cigre paper by C.W.Letchford and H.Hawes 2000 *"Risk Assessment to Improve Reliability of Transmission Facilities Exposed to Sub-Tropical High Wind Storm Events"*
- *"Numerical modelling of extreme tropical cyclone winds"* by B.A.Harper 1999.

Other information

- Maps of the transmission line network
- Number of structures and route kilometres for cyclone region (20km coastal strip north of 25th latitude), Southern and Central Queensland thunderstorm regions and all of Queensland

- Extracts from Powerlink's design manual showing structural design windspeeds for cyclone and thunderstorm regions
- Approximate costs for tension and suspension structures and per kilometre of transmission line by kilovolts
- Historical asset values for substations and lines from 2005/06 to 2009/10

In addition we had a number of discussions with Powerlink staff.

A.2 Data processing

Self-insurance Financial Report

The self-insurance financial report includes costs recorded by Powerlink against its self-insurance allowance during the current reset period. The report was initiated in 2007/08.

Work Order Data

Work orders for the last five years were reviewed by Powerlink engineers to identify those events that would fall within the scope of current insurance and self-insurance arrangements.

Data Interpretation

At Finity's request, Powerlink provided a consolidated list of events that allowed expenses from the data sources to be grouped for the purpose of calculating the appropriate deductibles in the subsequent analysis.

Only those work orders specifically identified as occurring before the self-insurance report was created were included in the below-deductible costs analysis.

A.3 Data validation

Powerlink advised that they are confident that they could demonstrate to the AER that:

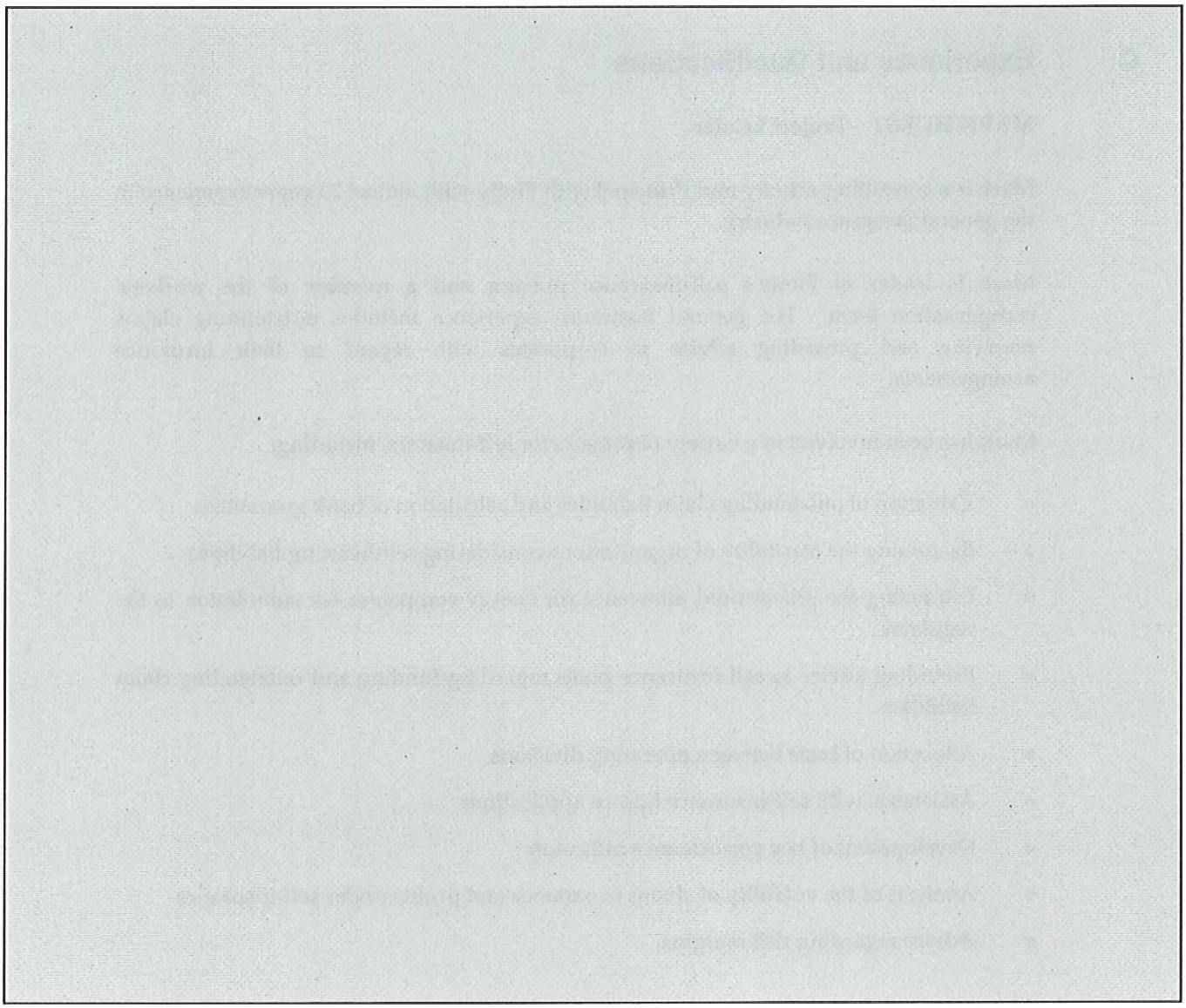
(a) there is no double counting between the data sources used by Finity in this assessment; and

(b) none of the expenses used in the retained cost assessment are included elsewhere in the revenue reset submission.

A.4 Reliance on data

We have relied on the accuracy and completeness of all information provided to us by Powerlink, both qualitative and qualitative, for the purpose of this review. We have not independently verified or audited the data. If for any reason, there is any material error

or omission in the information provided, then this may impact our estimates in which case our advice may need to be revised.



C Experience and Qualifications

MARK HURST - Project Leader

Mark is a consulting actuary and Principal with Finity with almost 20 years experience in the general insurance industry.

Mark is leader of Finity's self-insurance practice and a member of the workers' compensation team. His general insurance experience includes outstanding claims reserving and providing advice to corporates with regard to their insurance arrangements.

Mark has been involved in a variety of projects for self-insurers, including:

- Valuation of outstanding claim liabilities and calculation of bank guarantees
- Examining the feasibility of organisations considering self-insuring liabilities
- Estimating the self-insured allowance for energy companies for submission to the regulator
- Providing advice to self-insurance pools regarding funding and outstanding claim liabilities
- Allocation of costs between operating divisions
- Assistance with self-insurance licence applications
- Development of key performance indicators
- Analysis of the volatility of claims experience and profits under self-insurance
- Advice regarding risk margins.

Mark has authored, or co-authored, several self-insurance papers including "Assessing the Financial Viability of Moving to Self-Insurance" and "Measuring the success of your self-insurance program".

Mark's self-insurance clients include: Powerlink Queensland, Myer, TabCorp, Energex, Ergon Energy, Queensland Rail, and Primary Health Care.

Mark has Bachelor of Economics and Science degrees from the Australian National University and is a Fellow of the Institute of Actuaries of Australia.

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ADAM PAYNE - Senior Actuary

Adam is a consultant with Finity Consulting and has 13 years experience in actuarial consulting, specialising in the general insurance industry in the last 9 years.

Adam has provided advice on reserve levels, pricing, financial projections and reinsurance strategy. Adam is also the APRA Appointed Actuary for a small boutique insurance company.

Adam is heavily involved in Finity's self-insurance practice and provides actuarial advice to a number of workers compensation self-insurers as well as a NSW specialised workers' compensation insurer.

Adam has been involved in valuing the asbestos reserves for a number of insurance companies, including valuing the insurance liabilities for the NRG group of companies as part of the Solvent Scheme of Arrangement. He was also part of the CGU External Peer Review team, specifically charged with reviewing the asbestos liability provisions.

Qualifications

- Fellow of the Institute of Actuaries of Australia, 2003
- Bachelor of Economics (Actuarial), Macquarie University, 1996

Work history

- March 2005 to present: Finity Consulting – Consultant
- 2000 to 2005: Trowbridge Consulting/Trowbridge Deloitte – Consultant specialising in general insurance
- 1996 to 2000: Mercer, Sydney – Actuarial Analyst and Consultant specialising in superannuation