SAHA

TransGrid

Self Insurance Risk Quantification – Overview of Results

Date: 21 May 2008

Contact Person
Name: Mr Kumar Padisetti
Title: Partner
Mobile: +61 0412 199 065
Email: kpadisetti@sahainternational.com
Office: +61 (3) 9934 0601

Melbourne
Level 4, 190 Queen Street
Melbourne
VIC 3000
Australia
T +61 3 9934 0600
F +61 3 9602 4825

Sydney
Suite 1, Level 12, Tower 3
Darling Park
201 Sussex Street
Sydney
NSW 2000
Australia
T +61 2 8299 4200
F +61 2 9279 2066

Brisbane
Level 5, 500 Queen Street
Brisbane
QLD 4000
Australia
T +61 7 3230 3333
F +61 7 3230 3399

Wellington
Level 4, Clayton Ford House
128 – 132 The Terrace
PO Box 5350
Wellington
New Zealand
T +64 4 499 7007
F +64 4 499 7009

Johannesburg
Level 7, The Mall Office Tower
11 Cradock Avenue
Rosebank 2196
South Africa
T +27 11 268 8800
F +27 11 327 7344

Cape Town
Canal Walk West Office Tower
1st Floor Premises
Century Boulevard
Century City
Cape Town
South Africa
T +27 21 526 2700
F +27 21 552 0440

Windhoek
Level 7, Metje Behnsen Building
Independence Avenue
Windhoek
Namibia
T +26 4 61 224 620
F +26 4 61 205 2449

Disclaimer

Saha International Limited (SAHA) has prepared this report taking all reasonable care and diligence required. This report provides high-level analysis only and does not purport to be advice on particular investment options or strategies.

While SAHA has used all reasonable endeavours to ensure the information in this report is as accurate as practicable, SAHA, its contributors, employees, and Directors shall not be liable (whether in contract, tort (including negligence), equity or on any other basis) for any loss or damage sustained by any person relying on this document whatever the cause of such loss or damage.

This report is intended for the sole use of “The Client”, and should not be circulated to third parties without the express permission of SAHA.

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

DISCLAIMER

Saha International Limited (SAHA) has prepared this report, and all other accompanying reports, taking all reasonable care and diligence required. This report attempts to quantify the risks faced by TransGrid in relation to its Electricity Transmission business. The proposal document (and accompanying correspondence) should be read to provide a clear understanding of the terms of reference and the limitations of the report. Furthermore, accompanying this report are business specific confidential reports that provide more detail as to the methodology, assumptions and limitations supporting the quantification of TransGrid's self insurance premium.

The risks quantified in this report are typically infrequent in nature and therefore there is lack of comprehensive historical information. This combined with the inherent uncertainty when estimating future events makes it impossible to quantify the self-insured premium with any certainty. While SAHA have calculated the premiums based on the information provided to us as well as our view on the likely future experience, the actual experience could be considerably different from our estimates.

Any queries on the meaning of any statements in this report should be referred to SAHA. While due care has been taken in the preparation of the report, SAHA accepts no responsibility for any action which may be taken based on its contents.

In completing this review, SAHA has relied on documents and information provided to it by TransGrid and other third parties for the purpose of this review. SAHA has not checked information provided by third parties for accuracy, as it is beyond its scope of work. While SAHA has used all reasonable endeavours to ensure the information in this report is as accurate as practicable, SAHA, its contributors, employees, and Directors shall not be liable (whether in contract, tort (including negligence), equity or on any other basis) for any loss or damage sustained by any person relying on this document whatever the cause of such loss or damage. As such, these statements and any conclusions that may be drawn from them do not represent the advice of SAHA. SAHA accepts no responsibility for any use made of these statements.

EXECUTIVE SUMMARY

TransGrid is in the process of preparing its application for regulatory price resets for the period 2009 – 2014. As part of this application, TransGrid has engaged SAHA to undertake a valuation of its self-insured risks for its Electricity Transmission Network business as part of its revenue reset application.

SAHA was engaged by TransGrid to:

- Work with TransGrid to identify the key risks they face as a regulated electricity transmission business;
- Outline whether those risks were legitimate business risks that would be faced by an efficient electricity transmission business, having regard to the relevant circumstances faced by TransGrid; and
- Quantify those legitimate business risks.

The risks identified, and the relative regulatory treatment and high level quantification (where relevant) are outlined in the following table. It should be noted that the detailed methodology and assumptions used to derive TransGrid's specific self insurance risk premium is contained within a separate, confidential, report.

Table ES-1 – Overview of Risks

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Asbestos	The risk that TransGrid is found to be liable for claims related to the impact that asbestos, has, or previously had, on the health of its employees and third parties.	Cost Pass Through
Climate Change	Risk that the Federal Government will introduce an emissions trading scheme that includes within its scope, the emissions of electricity transmission businesses, including TransGrid.	Cost Pass Through
Electric and Magnetic Fields	The two key risks to TransGrid in relation to EMF are: • That a linkage is found between EMF and adverse health impacts such as childhood leukaemia and other cancers; and • That the ARPANSA (the regulator) draft standard on EMF may inhibit TransGrid's ability to undertake 'live-line' work, due to the potential exposure to EMF of its employees when undertaking this type of work.	Cost Pass Through
Business Continuity	Business continuity risk relates to future incidents or events that could significantly impact upon TransGrid's ability to continue normal business operations either in a specific region, following a localised event, or across their entire region, following a more widespread event. Examples include, but are not limited to: • Cyber Security • Tsunami; • Tropical cyclones; and • Pandemic illnesses.	Cost Pass Through

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Easements	TransGrid could possibly still incur costs associated with investigating easement encroachment issues, legal costs in defending claims related to encroachment, direct settlement costs if easement encroachment causes third party liability (eg: trees).	Cost Pass Through
Fraud Risk	TransGrid faces the risk of the recurring acts of fraudulent activity including: Theft, False Accounting, Bribery and Corruption, Deception and Collusion. This risk occurs, notwithstanding the fact that TransGrid has in place sound systems of internal control, proportional to risk.	$72.5k
Environmental Contamination	TransGrid is exposed to a number of environmental risks, each of which could lead to a range of legal and financial consequences for TransGrid. This may include settlement of claims by an individual or group of individuals who have suffered health effects or financial losses, legal costs associated with negotiating that settlement, and the cost of remediation of any contaminated site**.**	$1,000k
Bomb Threat / Hoax, Terrorism	TransGrid faces the risk that a malicious and deliberate act of sabotage by way of a bomb threat and or extortion attempt is undertaken by a third party. This would in turn impact on TransGrid's ability to deliver electricity, and / or the costs associated with delivering electricity.	$117.5k
Earthquakes	TransGrid's electricity transmission assets are subject to risk arising from earthquakes. Intense ground shaking, soil liquefaction, and surface faulting, can affect the structural and operational integrity of electricity assets.	$620k (<magnitude 7 earthquake) The costs associated with a magnitude 7 earthquake should be subjected to a cost pass through.

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Insurers' Credit	Insurer credit risk is faced by TransGrid where there is a possibility that its insurers may default. This could lead to a: • The loss of the premium paid; and/or • Liability exposure, when an insurer is unable to honour an insurance policy.	$27k
Counterparty Credit	TransGrid's revenue is received from distribution businesses, generators and large customers within the New South Wales Electricity market. Counterparty credit risk arises when there is some probability that one or more of these counterparties defaults on the payment of fees owed to TransGrid.	$47.5k
Bushfire	TransGrid is exposed to two types of bushfire related risks: • Exposure to liability for bushfires ignited by TransGrid assets that cause damage to TransGrid's own assets and/or a third party property and life; and • Bushfires caused by third parties (e.g. nature, deliberate lighting) that damage TransGrid's assets.	$455k
Risk of Non-Terrorist Impact of Planes and Helicopters	TransGrid may be legally liable for any losses or damages to aircraft and third parties in the event that an aviation accident or incident, not related to an act of terrorism, occurs as a result of an impact with TransGrid's electricity assets.	$445k

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Towers and Lines	There is an inherent risk that an exogenous incident could cause damage to TransGrid's transmission network. Moreover, the financial impact of these incidents on TransGrid is likely to vary year-on-year, depending on the severity of the event.	$3,350k
Key Assets (Transformers and Circuit Breakers)	The risk of failure of power transformers and circuit breakers causing damage to TransGrid own assets and consequential liabilities to third party properties.	$3,040k
Key Person Risk	The risk that TransGrid could bear an adverse financial impact due to the sudden departure, or death, of a key employee. A key employee is an employee who has a specialised and/or unique skill, or specific level of expertise or experience, that is integral to the ongoing success of TransGrid's core business.	$155k
Contractual Risks	Where the terms or conditions of a contract made between a third party and TransGrid exposes TransGrid to some residual risk (that is, TransGrid does not have mitigation mechanisms within the contract itself for a risk that would be reasonably expected to occur in relation to the provision of the service in question).	$57.5k
General Public Liability	'General Public Liability' risk covers incidents where TransGrid is liable for injuries or other losses suffered by a member(s) of the general public as a result of its (or its employees') negligence or fault, sometimes as determined by the court of law. This excludes risks covered elsewhere in this report (eg: bushfire, earthquake, transformers).	$62.5k

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Failure to Supply Risk	This represents the risk that TransGrid will be unable to provide electricity to the NEM, or that they will be unable to make their network available to generators.	$95k

SAHA considers above risks identified with TransGrid to be outside of TransGrid's control and therefore prudent and legitimate. During SAHA's quantifications, it has assumed that all insurance deductible costs or any other relevant costs associated due to the occurrence of these risks (in the past, at present or in the future) are not factored into TransGrid's base year operation and capital expenditures and therefore, are not included in TransGrid's revenue pricing submission. SAHA has not verified if these figures are included in TransGrid's base year.

It should be noted that all figures are adjusted to 07/08 dollar value.

1. INTRODUCTION

1.1 Background

TransGrid is in the process of preparing its regulatory submissions for the period 2009 – 2014. As part of this submission, TransGrid has engaged SAHA to undertake a valuation of its self-insured risks for its Electricity Transmission Network business.

1.2 Objective of this Report

The objective of this report is to:

- Outline all those asymmetric risks that SAHA identified as being faced by TransGrid that are not otherwise covered by regulation;
- Discuss each identified risk at a high level and discuss the potential for and/or preferred methods available for mitigation and quantification of that risk; and
- Identify the high level cost calculated for each risk.

It should be noted that the detailed methodology and assumptions used to derive each TransGrid's specific self insurance risk premium are contained within a separate, confidential, report.

1.3 What Is A Self-Insured Risk?

Self insurance risk, in the context of the regulatory submission process, involves the identification and quantification of all those legitimate asymmetric business risks faced by the regulated business. The quantification of this risk generally represents the 'expected cost' to the regulated business associated with this risk - with expected cost being a function of the probability of that risk occurring multiplied by the financial consequence to the regulated business of that risk occurring. Obviously, the sum of these variables can be affected by a number of different parameters specific to an individual business. For example, both the probability of a risk occurring, and the consequence of that risk to the regulated business, will be affected by:

- The level of external insurance taken out by that business (eg: $ value of deductible and caps pertaining to that risk or whether external insurance has actually been taken out for that risk at all);
- Capex and Opex programs that have already been implemented, or will be implemented over the regulatory period, that impact on the probability and / or the consequence associated with the occurrence of that risk; and
- The regulatory mechanisms that have been put in place, or are proposed to be put in place, to mitigate the impact of that risk on the regulated business. For example, some costs borne by the business can be directly passed through to end customers under certain circumstances (eg: cost pass through mechanisms for terrorism/tax changes; reopening clauses).

Therefore, self insurance risk can be seen to represent the residual exposure to a business related to a legitimate business risk, after having regard to all other risk mitigation mechanisms.

Table 1-1 - The relationship between Residual Risk and Self Insurance

Mitigation strategy for a particular event	Residual Cost = Self Insurance
Spending money to fully mitigate that legitimate business risk, with this reflected in O&M and capital costs, and hence prices	No self insurance cost
Spending money to partially mitigate that legitimate business risk, with this reflected in O&M and capital costs, and hence prices.	Estimating the probability * consequence of event, post the mitigation strategy (residual risk)
Taking out external insurance	Estimating the probability * consequence of an event, less the amount that will be covered by insurance
Taking out no insurance at all	Estimating the Probability * consequence of an event occurring
Regulatory mechanisms for that risk - cost pass through mechanisms / reopening provisions	No self insurance cost

In estimating TransGrid's self insurance risk premium, SAHA has, where possible, taken into account these alternative risk mitigation approaches in order to identify the residual risk faced by TransGrid. Moreover, this involved it identifying other risk mitigation strategies that TransGrid would have in place for the next regulatory period, including external insurance, capital and operating programs (with the latter being a function of the costs that were assumed to be included in the base year) and any regulatory risk mitigation mechanisms.

Providing for an allowance for self insured risk is supported by regulatory precedence, including by the AER, as evidenced through its:

- The AER Statement of Regulatory Principles for Transmission Businesses, which specifically allows for the inclusion of self insurance and other regulatory mechanisms to mitigate the risk of certain events on electricity transmission businesses. This is evidenced in the following quotes[1]:

  - *"The ACCC considered that the option of self-insurance, in addition to external insurance, should generally be available to TNSPs to allow them to select the most efficient approach. Alternatively, it suggested that where a risk is not controllable by*

[1] http://www.aer.gov.au/content/item.phtml?itemId=660012&nodeId=34e6efa6a0b7cef3988f1fb86c420f85&fn=Statement%20of%20regulatory%20principles%20%20background%20paper%20(8%20December%202004).pdf

the TNSP, it may be appropriate to include (as an alternative to receiving an allowance in the cash flows) a mechanism in the revenue cap that allows the TNSP to pass through to users the costs of certain events"; and

- *"The cost of self insurance will be recognised as an operating expense subject to the implementation of appropriate administrative arrangements".*

- The AER's guidance to the Transmission businesses in January 2007 specifically allowed for the inclusion of a self insurance risk premium, as long as certain conditions were met (eg: actuarial sign off)[2];

- The AER, in their recent electricity transmission decision for SP AusNet, specifically stated that the inclusion of a self insurance risk premium, which was based on a similar study to this, was prudent[3]:

  - *"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."*

The scope of the study was for SAHA to quantify the key risk events identified during its investigations and estimate an equivalent annualised self insurance cost for them.

1.4 Methodology for the Valuation of Self-Insured Events

SAHA was engaged by TransGrid to:

- Identify key risks that TransGrid faces as regulated electricity transmission business;

- Outline whether those risks are legitimate business risks that would be faced by an efficient electricity transmission company, having regard to the relevant circumstances facing TransGrid; and

- Quantify those legitimate business risks, or alternatively, outline other, more appropriate mechanisms for mitigating that risk.

For each risk identified, this report outlines:

- The methodology used by SAHA to quantify that risk; or

- SAHA's rationale for advocating the adoption of an alternative risk mitigation mechanism for that risk, in particular, a cost pass through provision.

In quantifying risks, SAHA has developed a methodology to analyse each event as they are different depending on type, impact on TransGrid and the information it can source for the event. The basis of SAHA's approach to quantify the value of each event is to multiply the following two quantities:

[2] http://www.aer.gov.au/content/item.phtml?itemId=709410&nodeId=726dc4ceb405de3b543c8db9f4867ffe&fn=First%20proposed%20submission%20guidelines.pdf

[3] http://www.aer.gov.au/content/item.phtml?itemId=714698&nodeId=cf54d675cb859054d44a54db5fd05550&fn=Draft%20Decision%20%20SP%20AusNet%20transmission%20determination%202008%20-%202014%20(31%20August%202007).pdf

- The estimated annual probability of that event occurring; and
- The estimated financial consequences associated with that event occurring.

The determination of probabilities and financial consequences is derived from a variety of sources. SAHA has based its estimates from the information it received from TransGrid, where available, market information, information from other jurisdictions, statistics/data from other relevant organisations and its experience in the utility industry.

In relation to risks that SAHA believes should be mitigated through a cost pass through mechanism, SAHA has:

- Detailed why it believes this risk is an asymmetric risk faced by the business;
- Outlined the business' current mitigation mechanisms in relation to that risk; and
- Outlined, in detail, why it believes it is more efficient and effective for that risk to be mitigated through the adoption of a cost pass through mechanism.

In relation to this latter point, SAHA's underlying criteria has been to only advocate a cost pass through mechanism if it believes that this treatment represents the least cost means of mitigating that risk. SAHA believes that this outcome is best for all stakeholders, including the business and its customers.

In making this assessment, SAHA has considered whether the:

- Risk is outside the control of the business, or primarily outside the control of the business. Under this scenario, the allocation of this risk to customers is likely to be the most efficient way of mitigating this risk; or
- Quantification of a self insurance allowance for that risk would be either necessarily subjective due to the nature of the risk, subject to a wide range of possible values, or could potentially expose the business to a catastrophic negative financial consequence if that risk were to eventuate. Under this scenario, the adoption of a cost pass through provision is likely to be a more efficient and effective way of mitigating this risk, as without such a risk mitigation approach, the business may be incentivised to undertake extremely expensive internal mitigation strategies in order to reduce the probability of this risk occurring, due to the uncertain and potential catastrophic impact of such a risk eventuating; and
- Provision of a cost pass through mechanism would provide a disincentive for the business to efficiently and effectively manage that risk (eg: moral hazard). Under this scenario, SAHA has assessed whether the business would still have an incentive to efficiently and effectively manage this risk internally, even in the face of a cost pass through mechanism.

In relation to the last point, SAHA notes that the general materiality threshold that the AER applies to any cost pass through application is analogous to a deductible contained within an insurance policy, which in itself provides a major incentive for the business to still manage any risk covered by a cost pass through provision.

1.5 Structure of Report

This report is structured in two Parts:

1. Self insured risks that should be subject to a cost pass through provision; and

2. Self insured risks that have been quantified for inclusion as part of TransGrid regulatory submission.

Within each Part, a number of different risks have been addressed.

2. SELF INSURED RISKS THAT SHOULD BE SUBJECT TO A COST PASS THROUGH PROVISION

The objective of this section of the report is to outline at a high level the risks that SAHA identified during this project that it believes are most appropriately treated via the adoption of a cost pass through provision. The following table encapsulates the key risks SAHA believes the AER should treat via the adoption of a cost pass through provision, and the rationale for advocating the adoption of a cost pass through provision.

Table 2-1 – Cost Pass Through Risks

Risk	Description of Risk
Asbestos	SAHA understands that the TransGrid has historically used asbestos products in their substations and old depot sites. Not only are the health effects of asbestos well known, but the potential financial consequences faced by firms found to have exposed their employees or the general public to asbestos are both significant and well publicised. As evidence, SAHA understands that an electricity distribution company in NSW has been required to provide financial compensation to a former employee as a result of the health effects resulting from asbestos exposure. As such, SAHA believes that there is a risk that TransGrid is found to be liable for claims related to the impact that asbestos, which was, or still is contained within its assets, has, or previously had, on the health of its employees and third parties. SAHA believes that the adoption of a cost pass through mechanism for the liability component of this risk represents the most efficient allocation of this risk. In particular, a class action could leave TransGrid financially vulnerable, and furthermore, this risk is, in many respects, outside TransGrid's control, given that the majority of cases are likely to involve historical exposures (eg: employees / third parties who have previously been exposed). Lastly, SAHA believes that there is unlikely to be any moral hazard issue in relation to the treatment of this risk via a cost pass through provision, as TransGrid will still be required to comply with its OHS Regulations (2001)[4], which address completely the safety aspects of Asbestos.

[4] http://www.legislation.nsw.gov.au/fullhtml/inforce/subordleg+648+2001+FIRST+0+N

Risk	Description of Risk
Climate Change	SAHA believes that TransGrid would face a significant financial risk if the Federal Government were to introduce an emission trading scheme that included within its scope, the emissions of electricity transmission businesses. If this were the case, a price would be placed on TransGrid emissions, which would in turn lead to it having to pay for all of the CO^2 it emits to the atmosphere as part of operating its electricity transmission business. The potential aspects of TransGrid's business that may be captured under any emissions trading scheme could include, amongst other things: • SF6 leakage; • Electricity losses on their system; and • Vehicle emissions. Furthermore, the introduction of an emissions trading system that includes emissions from electricity transmission businesses is likely to result in TransGrid having to incur other additional indirect costs, including: • Systems to monitor and quantify emissions; and • Auditing of reports outlining their level of emissions. Therefore, SAHA believes that TransGrid faces a legitimate risk associated with the Federal Government introducing a carbon trading scheme that included within its scope, the emissions of electricity transmission businesses. SAHA believes that it is appropriate for the direct (cost of emissions) and the indirect costs (systems, audits) costs borne by TransGrid as a result of the introduction of any emissions trading system to be passed on to their customers via the adoption of a specific cost pass through provision for this risk. The adoption of an emissions trading mechanism is entirely outside of TransGrid's control, and therefore, it would be inefficient for TransGrid to bear this risk going forward.

Risk	Description of Risk
Electric and Magnetic Fields	The two key risks to TransGrid in relation to EMF are: • That there has been a linkage between EMF and childhood leukaemia; and • That APANSA (the regulator) have released a Draft standard that may inhibit TransGrid's ability to undertake 'live-line' work, due to the potential exposure of its employees when undertaking this type of work. The financial consequences associated with these two risks are that TransGrid may: • Be exposed to a lawsuit from a third party in relation to an illness purported to be caused by EMF stemming from one of their electricity transmission assets; • There is a potential for large numbers of workers compensation claims. Whilst a number of the businesses insure against this risk, heavy claims experience would be expected that can lead to substantial premium increases; • Incur significant costs in defending any claim, even for unsuccessful EMF claims; • Incur increased costs associated with providing information to the public on EMF risks, especially when articles and reports on the topic are made public; and • Incur an increased level of direct costs, and an increased level of customer rebates, resulting from it having to change its current work practices to comply with new standards from APANSA, particularly in relation to its ability to undertake 'live line' work. SAHA believes that a cost pass through mechanism is the most appropriate means of treating this risk as: • The aforementioned evidence suggests this risk is quite uncertain in nature and scope, therefore making any quantification necessarily subjective and prone to significant margin of error; • The range of feasible payouts to third parties if liability by a TNSP is likely to be significantly large, which exacerbates the consequences associated with adopting an incomplete/inaccurate quantification in relation to this risk; and • There is unlikely to be any moral hazard issue in relation to the treatment of this risk via a cost pass through provision, as TransGrid will still have regard to EMF related issues when positioning assets in response to community concerns in relation to this issue. Furthermore, they would also suffer the obvious impact upon their reputation if an incident were to occur. SAHA believes that these factors will provide TransGrid with enough incentive to adopt cost effective mitigation procedures for these risks.

Risk	Description of Risk
Business Continuity	Business continuity risk relates to future incidents or events that could significantly impact upon TransGrid's ability to continue normal business operations either in a specific region, following a localised event, or across their entire transmission region, following a more widespread event. Examples include, but are not limited to: • Tsunami; • Tropical cyclones; • Pandemic illnesses; and • Cyber Security SAHA believes that Business Continuity risks, defined as those risks that have a very low probability of occurrence but potentially a very high impact, and which are not already being covered by either SAHA's self insurance risk quantification, or any other regulatory cost pass through mechanism, should be captured via the adoption of a specific cost pass through provision. In making this recommendation, SAHA had regard for the relative complexity associated with quantifying this class of risk, along with the exogenous nature of this risk, both of which lead it to believe that this risk is more appropriately treated via the adoption of a cost pass through provision.

Risk	Description of Risk
Easement	TransGrid maintains more than 12,000km of high voltage transmission lines for which it has negotiated easements with the majority of land owners whose land is impacted by easements. These easements provide TransGrid with a number of rights including the right to access the land to operate and maintain their transmission assets. While these easement rights are held in perpetuity, they may come under pressure for modification. The easement risk facing TransGrid takes three forms: • Changing land-use • Changing compensation practices • Changing environmental requirements As noted earlier, a self-insured risk can be related to an approach where the risk of a negative event is carried entirely by the company, either because insurance is not readily available for the type of risk or the cost of the insurance and any residual arising from deductibles or caps on payouts outweighs the possible benefits from insuring against the risk. Regulatory authorities have recognised the efficiency of this approach in a number of recent decisions where allowance has been made for reasonable self-insurance costs. Easement risks fall into this category of self insured risks, but unlike many of the other self insured risks assessed in this report, easement risks are not amenable to quantification. As a consequence some other form of provision would seem appropriate. Given the difficulty of quantification of this class of risk, regulatory approval for pass through of actual costs incurred in mitigating changing circumstances associated with the management of easements should be allowed.

3. SELF INSURED RISKS THAT HAVE BEEN QUANTIFIED IN DETAIL

The objective of this section of the report is to outline at a high level, the risks that SAHA identified during this project that it subsequently quantified in further detail. The following table encapsulates the key risks that SAHA quantified, the rationale for including this risk as a self insured risk, and the value of the self insurance allowance that it believes the AER should allow TransGrid to include within their regulatory submission.

SAHA notes that the detailed methodology and assumptions that it adopted to calculate TransGrid's self insurance allowance are contained within a separate confidential report. In undertaking this detailed quantification, SAHA has had regard for the linkage between TransGrid capital and operating expenditure programs, its level of external insurance, and this self insurance risk quantification. In particular, SAHA had regard for the information contained within TransGrid's most up-to-date insurance manual, in particular, the level of deductibles, exclusion clauses, and the limits of liability. Moreover, SAHA provided a Draft Report to TransGrid to ascertain whether or not the costs associated with bearing these risks are already being captured in TransGrid's pricing submission. SAHA has had regard to the responses provided by TransGrid's when undertaking this self insurance calculation. Notwithstanding this, SAHA reiterates that the quantifications contained within this report assume that those costs are not already included in TransGrid's regulatory submission.

Table 3-1 – Quantified Risks

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Fraud Risk	Both globally and in Australia, numerous incidents of fraud have occurred in recent years. More specifically, SAHA is aware of a number of utility businesses in Australia that have suffered from fraud related incidents over the previous five years. SAHA believes that TransGrid is at risk of the occurrence of fraudulent activity including: Theft, False Accounting, Bribery and Corruption, Deception and Collusion. This residual risk occurs, notwithstanding the fact TransGrid has in place sound systems of internal control, proportional to risk, and also that TransGrid has not experienced a material fraud related incident that they know about. SAHA believes that even if TransGrid has not experienced a fraud related incident, there is still a probability that such an incident can occur in the future. To calculate this probability, SAHA relied on an examination of the fraud incidents and company liability experience available for Australian and New Zealand companies. In particular, SAHA noted that previous surveys have identified a clear linkage between the size of the firm (based on employee numbers) and the probability of a company experiencing a fraud and the cost of that fraud. SAHA has used the results of these surveys, along with TransGrid's estimated number of full time employees, to derive its self insurance premium for this risk.	$72.5K

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Environmental Contamination	There are a number of aspects of TransGrid's business that could potentially expose it to the risk of unintentionally polluting its surrounding environment. It is noted that since 2000, TransGrid have incurred significant costs associated with environmental contamination incidents. These include: • Bindabella – sediment run off issues related to the clearing of easements; • Yass - waste and creosote dump; • Orange – creosote leaching; • Newcastle – creosote leaching; and • Removal of underground petrol tanks. In total, this has resulted in TransGrid incurring over $7.5m worth of costs. To derive a self insurance premium for this risk, SAHA has leveraged off historical data to attain a forward looking projection of the future cost to TransGrid of environmental contamination. SAHA has significantly discounted this baseline (average historic) costs due to the controllable nature of some of the historic events, along with its view that there will be a reduced probability of such an event occurring in the future, as fewer contaminated sites are in existence,	$1,000K

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Bomb Threat / Hoax, Terrorism	TransGrid faces the risk that a malicious and deliberate act of sabotage by way of a bomb threat and or extortion attempt is undertaken by a third party. Any threats or acts committed to damage TransGrid's assets or injure its staff will result in: • An increase in costs over and above those forecast in their regulatory submission, due to capital replacement costs, additional costs of having contractors/staff on standby, and increased overtime costs; • A possible loss in revenues due to the duration of the incident (due to price cap form of price control) and its resultant effects on the business due to time-off supply; • Possible compensation pay-outs to customers whose service is affected; and • Probable changes in security arrangements. To derive a self insurance premium for this risk, SAHA assessed the: • Probability of a Bomb Threat & Hoax affecting TransGrid * Impact of an incident; PLUS • Probability of a Terrorism event affecting TransGrid * Impact of a Terrorism incident. In calculating this, SAHA had regard for, amongst other things: • Bomb threat incident and statistic reports spanning 8 years from 1999 - 2006[5] from the ABDC; • Known and estimated costs incurred by other network energy business in responding to bomb threats, bomb hoaxes and other similar security incidents; • The applicability of the Terrorism Insurance Act, and the deductibles within TransGrid's existing insurance policies that will apply if a Terrorism event were to occur; and • A reasonable, yet conservative, estimate of the likelihood of a Terrorism event occurring.	$117.5K

[5] Source: http://www.afp.gov.au/__data/assets/pdf_file/48430/2006_ABDC_Annual_Report.pdf

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Earthquakes	TransGrid electricity Transmission assets are subject to the risk of major loss as a result of a catastrophic earthquake. Earthquakes result in intense ground shaking, as well as secondary effects such as soil liquefaction and surface faulting, which in turn can affect the structural integrity of electricity assets. In particular, SAHA notes that an earthquake can cause damage to TransGrid insured and self insured assets. In undertaking this assessment, SAHA focused on the probability and consequence associated with an earthquake of magnitude 5 and 6 impacting TransGrid area. In determining the probability and consequence associated with this risk, SAHA had regard for, amongst other things: • The number of earthquakes impacting each Australian state over the last 166 years from Geoscience Australia[6]; • Independent estimates of the area (km^2) affected by an earthquake of magnitude 5 and 6; • The average value of TransGrid insured and self insured assets per km^2; • The insurance deductibles pertaining to TransGrid's insured assets; and • The estimated percentage of overall costs that will be capital related versus operating costs.	$620K for < magnitude 7 earthquake The costs associated with a > magnitude 7 earthquake should be subjected to a cost pass through

[6] Sourced from Geoscience Australia - http://www.ga.gov.au/oracle/quake/quake_online.jsp. Compiled by SAHA

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Insurer's Credit Risk	In recent years, Australia saw insurer 'HIH' collapse leaving thousands of policyholders out-of-pocket. The collapse has lead to a wide range of businesses being exposed to retrospective product and public liability claims for many years into the future. This is because these types of insurance policies are traditionally written on an 'occurrence' basis, where an insured event which occurred during the year of coverage is met from that year's policy, even if the claim is made in the future. Therefore, SAHA believes that TransGrid's faces insurers credit risk, which represents the risk associated with one of its current insurers defaulting. This could lead to a: • Loss of the premium paid; and/or • Liability exposure, where an insurer who is unable to honor an insurance policy. In quantifying this risk, SAHA uses the cumulative default probabilities calculated by Standard and Poors for each credit rating, along with the current insurance premiums that TransGrid pays to each of its insurers, along with each insurer's credit rating.	$27K

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Counterparty Credit Risk	TransGrid receives its revenue from distribution businesses, generators and large customers operating within the New South Wales Electricity market. A key risk for TransGrid is counterparty credit risk, which captures the risk of a counterparty defaulting on the payment of transmission tariffs owed TransGrid. In quantifying this risk, SAHA applies a default probability to each counterparty's exposure, based on Standard and Poors latest cumulative default probability applicable to that counterparties current credit rating. Each counterparty's exposure is based on both their current average revenues and maximum revenues at risk to TransGrid.	$47.5K

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Bushfire Risk	Notwithstanding the fact that TransGrid undertakes extensive bushfire mitigation strategies, including developing and implementing a comprehensive Bushfire Risk Management Plan and taking out extensive external insurance, TransGrid is still exposed to a real and material residual bushfire risk. In particular, SAHA notes that TransGrid is exposed to the risk of: • Liability for bushfires ignited by TransGrid's assets that cause damage to its own assets and/or a third party property and life; and • Bushfires caused by third parties (e.g. nature, deliberate lighting) damaging their assets. In determining the probability and consequence associated with this risk, SAHA had regard for, amongst other things: • Data from the NSW Rural Fire Service,[7] which outlines the number of bushfires each year that are caused by electricity power lines; • The estimated number of bushfires started in NSW each year; • Historical bushfire incident records from TransGrid and the NSW DNSP's (EnergyAustralia, Country Energy and Integral Energy); • Data on the impact of a major and minor bushfire, and the number of major bushfires each year in NSW; • The insurance deductibles pertaining to TransGrid's insured assets; and • The estimated percentage of overall costs that will be capitalised versus those assumed to be operating costs.	$455K

[7] Sourced from: http://www.rfs.nsw.gov.au/file_system/attachments/State/Attachment_20050308_AD19D2F9.pdf

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Risk of Non-Terrorist Impact of Planes and Helicopters	There is a risk that TransGrid will be legally liable for any losses or damages to aircraft and third parties in the event that an aviation accident or incident, not related to an act of terrorism, impacts with one of its electricity transmission assets (i.e. non-terrorism related incidents). SAHA notes that the programs currently adopted by TransGrid do not fully mitigate this risk. Therefore, TransGrid is exposed to a residual risk. Furthermore, SAHA notes that TransGrid could theoretically undertake other programs to further mitigate the risk of such an event occurring, however the benefits of such programs, in terms of risk reduction, may not to outweigh the costs of such programs. If TransGrid is not allowed to recover this residual risk through this self insurance risk quantification, then there may be a perverse incentive for TransGrid to adopt one of these more costly, less efficient programs, in order to reduce it residual risk exposure. In determining the probability and consequence associated with this risk, SAHA had regard for, amongst other things: • Data from the Australian Transport Safety Bureau,[8] which outlines the number of crashes resulting from wire strikes over the last 30 years; • Data on the impact of those wire strikes on the aircraft and persons within that aircraft; • Historical records of aircraft incidents affecting TransGrid, and the costs associated with those incidents; • The insurance deductibles pertaining to TransGrid's insured assets and third party liability; • The average cost to TransGrid's self insured assets stemming from an aircraft incident; and • The estimated percentage of overall costs that will be capital related versus operating costs.	$445K

[8] Sourced from: http://www.rfs.nsw.gov.au/file_system/attachments/State/Attachment_20050308_AD19D2F9.pdf

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Towers and Wires	There is an inherent risk that an exogenous incident could cause damage to TransGrid Towers and Wires. Moreover, the financial impact of these incidents on TransGrid is likely to vary year-on-year, depending on the severity of the incident affecting the integrity of their Towers and Wires. SAHA has divided its analysis into five key categories, namely: • Risk Premium for Transmission Towers (500kV – 132kV); • Risk Premium for Transmission Poles (132kV only) • Risk Premium for Tower Conductors • Risk Premium for Pole Conductors • Risk Premium for Underground Cables In determining the probability and consequence associated with this risk, SAHA had regard for, amongst other things: • The fact that TransGrid has no external insurance for towers and wires and therefore, fully self insures for this risk; • Asset replacement costs for towers and poles; • Historical incidents related to tower and poles type transmission structure and the associated out of pocket costs related to these incidents; • Historical incidents related to conductors (overhead and underground) and the associated out of pocket costs related to these incidents; • The estimated percentage of overall costs that will be capital related versus operating costs; and • Historical records of consequential third party impacts for TransGrid.	$3,350K

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Key Assets (Power Transformers and Circuit Breakers)	TransGrid faces a real risk associated with the failure of power transformers and circuit breakers causing damage to their own assets and consequential liabilities to third party properties. In assessing this risk, SAHA was cognisant of the fact that there is a trade off between the replacement program undertaken by TransGrid and the residual risk that it bears in the normal running of their business. Therefore, it is clear that even with best practice procedures and policies to mitigate this risk, an efficient electricity transmission business may still bear a residual risk, and that this could in fact be the most efficient outcome for all stakeholders. Therefore, if TransGrid's is not allowed to recover this residual risk through this self insurance risk quantification, then there is likely to be a perverse incentive for TransGrid to adopt more costly, less efficient, risk mitigation mechanisms, such as increased investment in its infrastructure, in particular, through increased replacement programs for those assets approaching the end of their economic life. In undertaking this quantification, SAHA used TransGrid's historical failure rates along with their asset population figures and estimated costs of failure to quantify this risk.	$3,040K

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Key Person Risk	Key person risk represents the risk that TransGrid could bear an adverse financial impact due to the sudden departure, or death, of a key employee. A key employee is an employee who has a specialised and/or unique skill, or specific level of expertise or experience, that is integral to the ongoing success of TransGrid's core business. Generally, key person insurance is available to a business to cover against business interruptions and costs arising from the sudden departure or death of a key employee. However, TransGrid has not retained any external insurance arrangements, choosing instead to self-insure for exposure to key person risk. Whilst SAHA specifically excluded standard replacement costs in its assessment, as these were assumed to be included in TransGrid's base line opex costs, it did include the estimated Additional Replacement Costs (eg: additional costs, in excess of typical recruiting costs) and Business Disruption Cost (eg: loss/reduction of business income). SAHA applied resignation, mortality and disablement factors referenced to an Actuarial Review of the Victorian Energy Industry Superannuation Fund (prepared by William M Mercer 2006) to TransGrid's estimate of its number of key employees, by category, salaries, and business disruption cost associated with their departure.	$155K

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Contractual Risk	TransGrid enter into contracts with counterparties to complete both capital and operating works as part of their day-to-day business, and inherently there is a risk that the counterparty may not complete the required works appropriately. In most cases, the contractual arrangements themselves will include appropriate penalty clauses for the contracting party, hence mitigating the risk. However, it may be unviable for TransGrid to fully mitigate every risk through contractual arrangements, in particular, where the costs to TransGrid of mitigating that risk within the contract are greater than the benefits to TransGrid of mitigating that risk. In such a case, a residual risk is borne by TransGrid, which should then be passed onto customers, as this forms part of the least cost means of delivering electricity transmission services to those customers. SAHA has quantified two scenarios for contractual risk: • The risk that a major design and construction contractor defaults, incurring transition costs; and • The risk that Mincom defaults as TransGrid's IT provider, and as such, TransGrid incur unforseen transition costs when transferring to a new provider. In quantifying this risk, SAHA uses the cumulative default probabilities calculated by Standard and Poors for each credit rating, along with the current contractual fees that TransGrid pays to each of its contractors, along with an estimate of each contractor's credit rating.	$57.5K

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
General Public Liability Risk	'General Public Liability' risk covers incidents where TransGrid is liable for injuries or other losses suffered by a member(s) of the general public as a result of its (or its employees') negligence or fault, sometimes as determined by the court of law. This excludes risks covered in other aspects of this report (eg: bushfire, earthquake, transformers). SAHA's rationale for including this risk is based on the fact that even with best practice procedures and policies to mitigate this risk, an efficient electricity transmission business will still bear a residual risk. If TransGrid's are not allowed to recover this residual risk (whether through this self insurance risk quantification, or through its base operating cost forecasts), then TransGrid may be a perverse incentive for them to adopt more costly, less efficient, risk mitigation mechanisms, such as increased investment in its infrastructure. SAHA is not aware of TransGrid having incurred any third party general liability claims since its inception. However, SAHA believes that this risk is real and legitimate. Given the lack of industry wide information, the lack of TransGrid specific data, and the infrequent nature of such events, SAHA has had to make some assumptions with regards to the probability of such an event occurring. SAHA considers it reasonable to assume that a large scale general public liability event, with a consequence in excess of TransGrid's current $250,000 deductible, not related to a specific asset failure already covered in this report, could occur 1 in every 20 years.	$62.5K

Risk	Description of Risk	Quantification $ Over 5 yr Regulatory Period
Failure to Supply	Interruptions to the normal supply of electricity occur due to a number of factors and may last for less than one second or for several hours[9]. In relation to transmission systems, outages may occur for reasons including: • Storm damage • Lightning strikes • Bushfires • Insulator damage (resulting, say, from vandalism) • Feeders tripping • Busbars tripping at substations • Other plant failures For transmission companies, supply interruptions vary significantly each year and are generally due to one-off, weather-related factors. SAHA has divided its analysis into two categories, namely: • Risk Premium for Below the Deductible Incidents; and • Risk Premium for Above the Deductible Incidents. In determining the probability and consequence associated with this risk, SAHA had regard for, amongst other things: • Historical incidents related to failure and the associated out of costs related to these incidents; and • Global and National records of major failure incidents and the associated costs related to these incidents.	$95K

[9] http://www.escosa.sa.gov.au/webdata/resources/files/060120-D-ElectricitySupplyInterruptions.pdf

4. CONCLUSION

In the normal running of its business, TransGrid faces numerous asymmetric risks that, if they were to occur, would cause TransGrid to suffer a material financial consequence. Moreover, these risks aren't borne out of inefficiency; rather they are risks that any efficient electricity business would be likely to face in the same circumstances. In assessing what is a legitimate business risk, it is essential to understand the benefit / cost trade off associated with all possible risk mitigation procedures: namely external insurance, capital expenditure programs, operating expenditure programs, and self insurance. Within this raft of options, self insurance can theoretically be the most efficient outcome for all stakeholders. As such, it is conceptually correct for this risk to be factored into TransGrid pricing submission, where based on a robust and independent quantification.

To support their regulatory submission, TransGrid has engaged SAHA to undertake an independent detailed quantification of its asymmetric risks. The objective of this specific report was to:

- Outline key asymmetric risks that SAHA identified as being faced by TransGrid that are not otherwise covered by regulation;
- Discuss each identified risk at a high level and discuss the potential for and/or preferred methods available for mitigation and quantification of that risk; and
- Identify the high level cost calculated for each risk.

As such, this report is not designed to represent a detailed outline of the methodology, approach, assumptions and supporting data that SAHA used to undertake this quantification. These details are contained within a separate, confidential, report. It is this detailed confidential report that should be used as the basis for analysing the applicability of TransGrid self insurance risk quantification.