Otahuhu Substation Diversity Proposal

The Electricity Commission's Decision Paper

Report to MEUG

July 2007

Preface

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Authorship

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Contents

1. Introduction

On 25 May 2007 the Electricity Commission (the Commission) issued notice of its intention to approve a Proposal it had received from Transpower New Zealand Limited (Transpower) on 11 December 2006. The Transpower Proposal involves an upgrade of the Otahuhu substation and the construction of a new Gas Insulated Switchgear (GIS) switchyard at the Otahuhu site. More specifically, it involves the following:

- Remove all over-crossings of existing substation at Otahuhu
- Install bus section circuit breakers in the existing 220kV switchyard
- Procure, construct, commission and operate a 220 kV GIS switchyard and a new AIS switchyard at Otahuhu, connected and adjacent to, but geographically separated from, the existing switchyard
- Transfer approximately half of the circuits from the existing switchyard to the new switchyards
- Obtain designations, and resource consents necessary for the above
- Plan for commissioning of new switchyard by 2009.

The Commission intends to approve the lesser of $99 million (including contingencies) in 2009 dollars, or the actual cost of implementing the Proposal. The $99 million in 2009 dollars represents the 90 percentile of Transpower's probability distribution for the costs of the Proposal.

The Major Electricity Users' Group (MEUG) has asked NZIER to provide it with a report on the decision paper the Commission issued which included its intention to approve the Proposal.[1] This paper is that report. In the next section we outline the justification that the Commission has provided for reaching its current intention and analyse its logic and validity having regard to the Rules which the Commission is required to apply. Section 3 summarises our conclusions.

2. The Commission's Rationale

2.1 Overall approach

In brief, under rule 13.4.1 of section III of part F of the Electricity Governance Rules (the Rules) the Commission may approve a reliability investment if the Commission is satisfied that the investment:

- Reflects good electricity industry practice (GEIP) in meeting the grid reliability standards (GRS) set out in the Rules

[1] Electricity Commission, *Reasons for Decision set out in Notice of Intention to Approve Transpower's Otahuhu Substation Diversity Proposal*, May 2007. Hereafter referred to as the *Otahuhu Decision Paper*.

- Complies with the process set out in the Rules
- Meets the requirement of the grid investment test (GIT)

The Commission concludes the Proposal meets the three conditions above. It, therefore, concludes it is entitled to approve the investment and has formed the intention that it will do so.

2.2 No consideration if reliability investments

A curious feature of the Commission's decision document is the absence of any consideration of whether the Proposal constitutes "reliability investments", as that term is defined in the Rules. The Commission has evaluated the Proposal under rule 13 of section III of part F and this rule applies only to reliability investments. What the Commission has not done is establish that the Proposal is a reliability investment under the Rules. The Commission does establish that when the Proposal has been implemented the grid will satisfy the GRS, but this is not the same thing as establishing that the Proposal is a reliability investment.

Reliability investments are defined as "investments by **Transpower** in the **grid**, or alternative arrangements by **Transpower**, the primary effect of which is, or would be, to reduce **expected unserved energy**." In our opinion, the Proposal meets the test to be a reliability investment, but we are surprised the Commission appears to have failed to consider the first element of the tests it is required to apply; whether it is considering the Proposal under the right rule.

2.3 Contentious elements

In our opinion the contentious elements of the Commission's intention is its decision:

- Not to explicitly require Transpower to evaluate an alternative to its proposed reliability investment that built on the approach in the $14 million option in Transpower's earlier IGE application and involved the minimum investment required to satisfy the GRS over the next several years; and
- That the Proposal meets the requirements of the GIT and specifically the Commission's view that improvements beyond the minimum necessary to meet the N-1 safety net do not need to meet the requirements of clause 4.2 of the GIT – the positive net market benefits requirement.

2.3.1 No minimal investment option

The Commission's apparent rationale for not requiring Transpower to evaluate a minimum necessary investment option such as one based on the $14 million option in the IGE application appears to be:

> *The Commission published Transpower's proposal on the Commission's website and provided an opportunity for interested parties to provide written comments on Transpower's proposal and to request that the Board consider alternatives to Transpower's proposal. No requests were received, although the major Electricity Users' Group (MEUG), Rio Tinto Aluminium (New Zealand) Limited, and Norske Skog Tasman Limited all stated that Transpower should have included as an option the $14 million investment described in the IGE Proposal.*[2]
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> ...
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> *Option 1 presents a longer-term view than the [$14 million] IGE option, and is staged over time so that developments are constructed and commissioned in conjunction with other developments, for example the construction and commissioning of the NIGU Proposal.*[3]

The Commission does not say that Option 1 represents the minimum investment needed to meet the GRS, even over the 20-year time frame the Commission has decided to adopt. Indeed, the Commission believes it necessary when justifying its decision to disagree with the view that improvements beyond the minimum necessary to meet the GRS should be evaluated against clause 4.2 of the GIT and not clause 4.1. This strongly suggests that the Commission believes Transpower has not evaluated the minimum investment option, or otherwise why does it need to provide this justification and surely it would have said Option 1 is the minimum investment approach, if this was the case.

In October 2006, the Commission actually resolved that if Transpower applied for the $14 million upgrade it would approve it and delegated Commissioner Harris to do so without further recourse to the rest of the Commissioners.[4] Clearly, the Commissioners at this stage were convinced that this option would allow the grid to meet the GRS and was the optimal one under the GIT.

Whether the comments of MEUG, Rio Tinto and Norske Skog amounted to requests to have the minimum investment option evaluated, or not, is irrelevant. Even if they did make such requests there is no obligation on the Commission to act upon them. However, the Commission is entitled under rule 13.3.3.3 of section III of part F to require Transpower to evaluate an alternative reliability investment.

In our opinion, given this background and the apparent cost disparity between a $14 million option that was put forward earlier by Transpower and the $99 million Proposal that it later favoured, it was not reasonable of the Commission to

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[2] Electricity Commission, *Otahuhu Decision Document*, paras. 5.8.5 and 5.8.6

[3] Electricity Commission, *Otahuhu Decision Document*, para. 5.8.12.

[4] Mervyn English to Tim George, 13 October 2007.

fail to use its powers to request Transpower to evaluate the option that minimises the amount of investment required to meet the GRS.

2.3.2 Reliability investments and the GIT

In the Commission's view, improvements beyond the minimum necessary to meet the N-1 safety net do not need to meet the requirements of clause 4.2 of the GIT – the positive net market benefits requirement. The Commission rejects a requirement for investment over and above the minimum necessary to meet the GRS to be assessed under the GIT as an economic investment and be approved only if it maximises net market benefits and such benefits are positive. It does this on the grounds that such a requirement "would lead to the approval of least initial cost projects, and incremental, piecemeal developments."[5] It claims that an interpretation of the GIT along these lines "does not reflect that the GIT requires a long-term view of investment proposals."[6]

However, the Commission's proposition that an investment can be approved even if it is not necessary to meet the GIT and has a negative net market value is contrary to the main purpose of the investment decision making in part F, which is to ensure that investments are efficient. It is also contrary to the Rules. Rule 4 of the GIT provides:

> *A proposed investment satisfies the grid investment test if the Board is reasonably satisfied that for a proposed investment that is necessary to meet the reliability standard set out in clause 4.2 of the grid reliability standards the proposed investment maximises the expected net market benefit or minimises the expected net market cost compared with a number of alternative projects ... ; or*
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> *for any other proposed investment the proposed investment maximises the expected net market benefit compared with a number of alternative projects the expected net market benefit of the proposed investment is greater than zero.*

It is hard to understand how it could be plainer. Contrary to the Commission's claim, unless it is shown that an investment **is necessary** to meet clause 4.2 of the GRS, it cannot be approved unless it generates a positive net market benefit, and even then it can only be approved if it creates the largest positive one among the alternatives. The test is not whether the investment is a reliability investment, and it is not whether after the investment the grid will satisfy the GRS. The test is whether the investment **is necessary** for the grid to meet clause 4.2 of the GRS. For the grid to satisfy this it must be such that "with all **assets** that are reasonably expected to be in service, the power system would remain in a **satisfactory state** during and following any **single credible contingency event** occurring on the **core grid**."

[5] Electricity Commission, *Otahuhu Decision Document*, para. 4.4.5.

[6] Electricity Commission, *Otahuhu Decision Document*, para. 4.4.5.

The Commission and Transpower have made no attempt to show that the three options they have evaluated in this instance are necessary for the grid to meet the GRS; they have instead considered whether they are **sufficient** for the grid to meet this standard, and have concluded they are.

This issue is not splitting hairs; it goes right to the heart of the role of the Commission in relation to approving grid investments. The principal objective of the transmission investment component of the Rules is to ensure efficient investment. A limited exception to this is provided for in the Rules when an investment is necessary for the grid to satisfy the GRS. The Commission is trying to interpret this as an exception that allows it to approve inefficient investments on the grounds that after the investments the grid will meet the GRS.

Under such an approach almost every investment Transpower may care to put forward could be packaged so it is justified by the test the Commission proposes. It is a virtual license for gold plating. There are a reasonable number of very important substations in the New Zealand grid serving sizable populations and important industries or infrastructure. The Commission's approach means that many of these substations should now be duplicated. Why is Otahuhu more important than Islington, Whakamaru or Central Park when the criteria of positive net market benefit for investment above the minimum needed to meet the GRS is abandoned? What rationale is the Commission going to now use to deny Christchurch, Wellington and other centres the same uneconomic back up as it has decided must be provided for Auckland, and for which the rest of the country should be forced to contribute financially towards, for upwards of the next 60 years?

The Commission's approach is plainly outside the Rules. Specifically, the Commission has failed to test and show that the Proposal is necessary for the grid to satisfy clause 4.2 of the GRS and so has failed to test and show that the Proposal qualifies to be assessed under clause 4.1 of the GIT. According to the Rules, therefore, the proposal must be assessed under clause 4.2 of the GIT. The Proposal fails the requirement under clause 4.2 of the GIT to have a positive net market value by $65.8 million.[7]

To put this another way, the Commission is proposing to act contrary to the Rules and according to its own estimates its actions of doing so will waste in net present value terms $65.8 million of New Zealand's resources. This estimate of economic waste is after allowing a very dubious benefit of $11.7 million for the reduction in high-impact low probability (HILP) events. It is highly unlikely that the development of a second substation at the same site would create this level of incremental benefit, and the analysis of the Commission's staff confirms this to be the case. The Commissioners supporting the intended decision have had to "adjust" upwards by a very significant and implausible amount the probability of HILP events in order to get the estimate of $11.7 million. Evidence to support this

[7] Electricity Commission, *Otahuhu Decision Document*, para. 7.1.3, Table 7.1.

adjustment is not provided. If this benefit is overstated the waste flowing from the decision is even greater.

The Commission has not even attempted to justify why it thinks it is appropriate for it to disregard the Rules and divert $99 million of New Zealand's resources into grid investments that will fail to provide a positive net market benefit. It is not possible to justify the $65.8 million in terms of the benefits of the added security through duplication of the substation. The estimated $11.7 million value of the benefit from duplication has been taken into account in arriving at the $65.8 million net market cost figure.

Nor is it valid to justify the proposed expenditure in terms of the Government Policy Statement's emphasis on security of supply. While the Electricity Act 1992 requires the Commission to "give effect to GPS objectives and outcomes",[8] this Act also requires that "GPS objectives and outcomes must be consistent with the purpose of the part and functions, principal objectives and specific outcomes of the Commission."[9] The principal objectives and specific outcomes stipulated in the Electricity Act refer in several places to efficient provision. Indeed, efficiency is the key outcome sought. In the context in which the Act requires the GPS to be considered by the Commission, it is not credible for the Commission to suggest that the GPS empowers it to authorise an investment that will cost tens of millions of dollars more than the benefits it generates, including its benefits in terms of increased security of supply.

In our opinion, if the Commission follows through with its stated intention, it has not acted reasonably in the way it has assessed the investment relative to the Rules.

3. Conclusions

The Commission has evaluated the Proposal under rule 13 of section III of part F and this rule applies only to reliability investments. What the Commission has not done is establish that the Proposal is a reliability investment under the Rules.

Whether the comments of MEUG, Rio Tinto and Norske Skog amounted to requests to have the minimum investment option evaluated or not is not relevant. Even if they did make such requests there is no obligation on the Commission to act upon them.

In our opinion, given this background and the apparent cost disparity between a $14 million option that was put forward earlier by Transpower and the $99 million Proposal that it later favoured, it was not reasonable of the Commission to fail to use its powers to have Transpower evaluate the option that minimises the amount of investment required to meet the GRS.

[8] Electricity Act 1992, s. 172O (j).

[9] Electricity Act 1992, s. 172ZK (4).

Contrary to the Commission's claim, unless it is shown that an investment **is necessary** to meet clause 4.2 of the GRS, it cannot be approved unless it generates a positive net market benefit, and even then it can only be approved if it creates the largest positive one among the alternatives.

The test is not whether the investment is a reliability investment and it is not whether after the investment the grid will satisfy the GRS. The test is whether the investment is necessary for the grid to meet clause 4.2 of the GRS.

For the grid to satisfy this it must be such that "with all assets that are reasonably expected to be in service, the power system would remain in a satisfactory state during and following any single credible contingency event occurring on the core grid."

The Commission and Transpower have made no attempt to show that the three options they have evaluated in this instance are **necessary** for the grid to meet the GRS; they have instead considered whether they are **sufficient** for the grid to meet this standard, and have concluded they are.

The Commission's approach is plainly outside the Rules.

Specifically, the Commission has failed to test and show that the Proposal is necessary for the grid to satisfy clause 4.2 of the GRS and so has failed to test and show that the Proposal qualifies to be assessed under clause 4.1 of the GIT.

According to the Rules, therefore, the proposal must be assessed under clause 4.2 of the GIT.

The Proposal fails the requirement under clause 4.2 of the GIT to have a positive net market benefit by a large margin - $65.8 million.

The Commission has not even attempted to justify why it thinks it is appropriate for it to disregard the Rules and divert $99 million of New Zealand's resources into grid investments that will fail to provide a positive net market benefit. It cannot reasonably justify its intention to approve the investment by reference to the GPSs emphasis on security of supply

In our opinion, if the Commission follows through with its stated intention, it has not acted reasonably in the way it has assessed the investment relative to the Rules. It has also created a very dangerous and potentially very expensive precedent. On what basis is the Commission now going to deny proposals to upgrade a considerable number of substations since it has decided that the investments do not need to be the minimum necessary to meet the GRS and expenditure above the minimum does not need to generate a positive net market benefit?