

**ASSESSMENT OF  
TRANSPOWER'S APPLICATION FOR INTERIM GRID  
EXPENDITURE DATED 14 APRIL 2005  
(TACTICAL TRANSMISSION UPGRADES)**

**Summary of submissions and responses**

**Explanation of the Commission's final decisions**

**December 2005**

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## 1 INTRODUCTION AND PURPOSE

### 1.1 TTU Application

1.1.1 On 14 April 2005, Transpower applied to the Electricity Commission (**Commission**) under rule 16 of section III of the Electricity Governance Rules 2003 (**Rules**)<sup>1</sup> for approval of Interim Grid Expenditure (**IGE**) related to a number of Tactical Transmission Upgrade projects (**TTU Projects**).

1.1.2 Transpower's application (**TTU Application**) was for approval for expenditure on 30 TTU Projects at a total cost of \$158.235 million.

### 1.2 Process

1.2.1 The Commission considered the information provided in support of the TTU Application and Transpower's responses to the Commission's requests for further information between May and September 2005, and made some indicative decisions in early October 2005.

1.2.2 The Commission then published a paper for consultation dated 7 October 2005 (**Consultation Paper**), in accordance with rule 16.4.2, that set out its approach to the tests under rule 16 and its indicative decisions with respect to the TTU Application. A total of 10 submissions were received from interested parties.

1.2.3 The Commission also requested further information from Transpower. It has now considered that information and submissions and has made its final decisions in respect of the TTU Application.

1.2.4 Table 1 below provides a summary of this process.

Activity	Date	Elapsed time from previous activity
Application submitted	14 April 2005	N/A
Commission sends questions to Transpower	25 May 2005	6 weeks
Transpower provides response	1 July 2005	5.2 weeks
Commission sends questions to Transpower	5 August 2005	5 weeks
Transpower provides response	12 September 2005	5.3 weeks
Consultation paper published	7 October 2005	3.4 weeks

<sup>1</sup> Unless otherwise stated, all rule references in this paper are to section III of part F of the Rules.

Activity	Date	Elapsed time from previous activity
Commission sends questions to Transpower	7 October 2005	3.4 weeks
Transpower provides response	28 October 2005	3 weeks
Other parties provide submissions	31 October 2005 (extended from 28 October 2005)	3.3 weeks
Transpower provides further additional information	4 November 2005	4 weeks (from when questions asked)

Table 1: Summary of process regarding TTU Application

### 1.3 Purpose

- 1.3.1 This paper sets out a summary of the submissions received from interested parties and explains the Commission's final decisions with respect to the TTU Application.

## 2 BACKGROUND

### 2.1 Rules

- 2.1.1 Rule 16 provides as follows:

#### 16.1 Board may approve interim grid expenditure

The **Board** may approve interim **grid** expenditure proposed by **Transpower** having regard to the purpose and principles set out in rule 16.2.

#### 16.2 Purpose and principles

16.2.1 The purpose of this rule is to allow the **Board** to approve interim grid expenditure proposed by **Transpower** before the Board makes final decisions on the first **grid upgrade plan**.

16.2.2 The **Board** must be satisfied that the proposed **grid** expenditure is additional to **Transpower's** normal ongoing **grid** expenditure.

16.2.3 The **Board** must also be satisfied that the proposed **grid** expenditure is:

16.2.3.1 reasonably prudent or necessary to meet **Transpower's** current grid reliability standards; ...

- 2.1.2 The Commission has interpreted rule 16 as requiring proposed expenditure to satisfy three tests in order for the Commission to be entitled to approve it, as follows:

- (a) **Test A:** proposed expenditure must be interim grid expenditure (**IGE**) proposed by Transpower before the Board makes final decision on the first grid upgrade plan (**GUP**) (rule 16.2.1);
- (b) **Test B:** proposed grid expenditure must be additional to Transpower's normal ongoing grid expenditure (rule 16.2.2); and
- (c) **Test C:** proposed grid expenditure must be reasonably prudent or necessary to meet Transpower's current grid reliability standards (rule 16.2.3.1)<sup>2</sup>.

2.1.3 Under each of the above tests Transpower must provide such information as the Commission considers is reasonably necessary to enable it to properly consider and decide whether or not to approve proposed interim grid expenditure (rule 16.3).

## 2.2 Categorisation of TTU Projects

2.2.1 The Commission assessed the information provided by Transpower in support of the TTU Application against the three tests above and placed each of the TTU Projects into four categories, namely:

- (a) Category A (approve);
- (b) Category B (customer specific);
- (c) Category C (request further information); and
- (d) Category D (economic investments - decline).

2.2.2 The following summary table (Table 2) of this categorisation was published along with the Commission's indicative decisions on 7 October 2005.

Category	Affected TTUs	Total Cost (million)
A	1,2,3,4,5,6,8,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,30	\$132.46
B	7,29	\$1.22
C		\$0.0
D	9,10,11,12,13	\$24.55
<b>Total</b>		<b>\$158.23</b>

**Table 2: TTU projects by Commission approval category 7 October 2005**

<sup>2</sup> Note that there are two other alternative Tests C in rule 16.2.3, but in the case of the TTU Application, the test in rule 16.2.3.1 is the relevant one.

### 3 ANALYSIS OF TRANSPOWER INFORMATION

3.1.1 In response to the Commission's request for further information and clarification of the TTU projects, dated 7 October 2005, Transpower supplied information dated 28 October 2005 and 4 November 2005.

3.1.2 This section analyses the information provided by Transpower.

#### 3.2 Test A: IGE proposed by Transpower before the Board makes final decision on the first GUP (rule 16.2.1)

3.2.1 In its letter of 5 August 2005, the Commission indicated to Transpower that the Commission considered that it was unable to approve expenditure that had been incurred or committed prior to 14 April 2005<sup>3</sup>, since expenditure prior to that date was not "proposed" in the TTU Application.

3.2.2 Transpower provided details of such expenditure in respect of each TTU Project on 4 November 2005<sup>4</sup>, as set out in column 3 of Table 3 below:

1 TTU Project number	2 Interim grid expenditure applied for 14/4/05	3 Actual and committed expenditure to 14/04/05	4 Amount open to the Board to approve	5 Cate- gory
1	\$2.300 million	\$2.194 million	\$0.106 million	A
2	\$0.700 million	\$0.263 million	\$0.437 million	A
3	\$1.700 million	\$1.332 million	\$0.368 million	A
4	\$2.400 million	\$0.008 million	\$2.392 million	A
5	\$1.400 million	\$0.006 million	\$1.394 million	A
6	\$0.800 million	\$0.536 million	\$0.264 million	A
7	\$0.720 million	\$0.607 million	\$0.113 million	B
8	\$0.250 million	\$0.066 million	\$0.184 million	A
9	\$1.650 million	\$1.606 million	\$0.044 million	D
10	\$6.400 million	\$0.602 million	\$5.798 million	D
11	\$3.200 million	\$0.267 million	\$2.933 million	D
12	\$8.500 million	\$0.000 million	\$8.500 million	D
13	\$4.800 million	\$1.220 million	\$3.580 million	D
14	\$1.450 million	\$1.150 million	\$0.300 million	A
15	\$32.500 million	\$0.781 million	\$31.719 million	A

<sup>3</sup> this being the date of the TTU Application

<sup>4</sup> Although Transpower provided some information on 12 September 2005 that set out what expenditure it had incurred or committed prior to 14 April 2005, this was aggregated according to the categorisation dated 5 August 2005. The Commission re-categorised some projects on 7 October 2005, having considered the further information provided by Transpower on 12 September 2005. Therefore, on 7 October 2005 the Commission asked Transpower to provide the information on committed or incurred expenditure on a project-by-project basis, in order that the Commission could confirm what amounts of IGE it could approve, no matter what the final project categorisation turned out to be.

1 TTU Project number	2 Interim grid expenditure applied for 14/4/05	3 Actual and committed expenditure to 14/04//05	4 Amount open to the Board to approve	5 Cate- gory
16	\$5.000 million	\$0.387v	\$4.613 million	A
17	\$7.200 million	\$2.952 million	\$4.248 million	A
18	\$20.200 million	\$1.453 million	\$18.747 million	B/C
19	\$3.200 million	\$2.274 million	\$0.926 million	A
20	\$0.260 million	\$0 million	\$0.260 million	A
21	\$2.700 million	\$0 million	\$2.700 million	A
22	\$3.100 million	\$3.004 million	\$0.096 million	A
23	\$1.600 million	\$1.750 million	\$0 million	A
24	\$3.800 million	\$0.430 million	\$3.370 million	A
25	\$3.800 million	\$0.277 million	\$3.523 million	A
26	\$1.200 million	\$0.016 million	\$1.184 million	A
27	\$25.800 million	\$0.264 million	\$25.536 million	A
28	\$7.300 million	\$0 million	\$7.300 million	A
29	\$0.500 million	\$0.073 million	\$0.427 million	B
30	\$3.800 million	\$3.719 million	\$0.081 million	A
<b>TOTAL</b>		\$27.239 million		

**Table 3: Summary of TTU expenditure that the Commission may approve to satisfy Test A (rule 16.2.1)**

3.2.3 A number of parties commented on the Commission's approach to Test A during consultation, and in particular, on the Commission's approach to committed or incurred expenditure. These comments are discussed in section 4.2 of this paper.

### **3.3 Test B: proposed grid expenditure must be additional to Transpower's normal ongoing grid expenditure (rule 16.2.2)**

3.3.1 In assessing whether the proposed expenditure is "additional to Transpower's normal ongoing grid expenditure", the Commission considered both the nature and the level of the expenditure and asked the following questions:

- (a) Is the expenditure over and above the aggregate annual historical level of Transpower's typical or regular, and continuous, expenditure relating to the grid?
- (b) Is the expenditure not in the nature of Transpower's typical or regular, or continuous, expenditure in relation to the grid?

3.3.2 Transpower's response of 1 July 2005 regarding ongoing grid expenditure<sup>5</sup> put the ability of the TTU Projects to meet Test B into question.

3.3.3 However, based on information supplied by Transpower on 8<sup>6</sup> and 25 July 2005<sup>7</sup>, the Commission considered that it is apparent that Transpower's aggregate annual grid expenditure is higher than its annual grid expenditure has been in the past five years, and that the expenditure on the TTU Projects is not in the nature of Transpower's typical or regular expenditure. Therefore, the Commission did not require any further information from Transpower on 7 October 2005 to satisfy itself that Test B had been met with respect to the TTU Application.

3.3.4 A number of parties commented on the Commission's approach to Test B during consultation. These comments are discussed in section 4.3 of this paper.

### **3.4 Test C: proposed expenditure must be reasonably prudent or necessary to meet Transpower's current grid reliability standards (rule 16.2.3.1)**

3.4.1 The application of Test C led the Commission to place each of the TTU Projects into the four approval categories, A to D, outlined in paragraph 2.2.1 above.

3.4.2 The Commission asked Transpower further questions about TTU Projects 15-17 and 27-28. This section sets out a summary of why the Commission asked Transpower the questions that it did on 7 October 2005 and analyses the information provided by Transpower in response to those questions.

#### *TTU Projects 15, 16 and 17 – Background and Assessment of Transpower information*

3.4.3 The Commission identified in its 5 August 2005 letter to Transpower that TTU Project 15 directly affects the necessity for TTU projects 16 and 17. Transpower had also indicated that TTU Project 16 was customer specific in the information it provided on 1 July 2005. The Commission therefore asked Transpower in that letter to provide analysis indicating why the installation of a third 220kV circuit between Islington and Kikiwa (**Third Circuit Option**) was a better alternative when compared with alternatives such as the installation of a 100MVar SVC in Nelson/Marlborough (**SVC Option**).

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<sup>5</sup> On page 4 of its 1 July 2005 letter, Transpower stated that "*Rule 16.2.2 provides that the transitional provisions may be utilised by Transpower in respect of "normal ongoing grid expenditure"*". Transpower also expressed the view, in a subsequent letter to the Commission, that the IGE on each of the TTU Projects is "normal ongoing grid expenditure", because that expenditure represents "a cyclical peak in the capital requirements to maintain security in line with load growth".  
<http://www.transpower.co.nz/notion/share/download.asp?cid=5592&csid=14893&mdid=&file=%2Fupload%2Fnotion%2Fsectionimages%2F14893%5Fttu%2Dprojects%2Dresponse%2Dec%2Djuly%2D2005%2Epdf>

<sup>6</sup> Email from Kevin Mackey to Mervyn English, Friday, 8 July 2005 4:47 pm containing a spreadsheet of costs

<sup>7</sup> Email from Dave Boyle to Peter Smith, Monday 25 July, containing a revised spreadsheet of costs

- 3.4.4 On 12 September 2005, Transpower submitted additional power systems analysis and an economic assessment for TTU Projects 15, 16 and 17 in support of its decision to the Third Circuit Option. However, Transpower provided only one alternative to these projects, namely the the SVC Option.
- 3.4.5 Transpower indicated in its analysis that in order for the SVC Option to be installed in 2006, a third Islington–Kikiwa 220kV circuit would need to be installed in 2014, and that for the Third Circuit Option to be installed in 2006, a 100MVAR SVC would need to be installed in 2014.
- 3.4.6 Preliminary analysis based on the financial information provided by Transpower indicated that:
- (a) the least-cost solution for the Upper South Island voltage stability issue was sensitive to:
    - (i) the capital cost of the SVC (which will also depend on its optimised rating);
    - (ii) the incorporation of incremental losses; and
    - (iii) the timing of the installation of the SVC and the Third Circuit Option if these were reversed.
  - (b) the avoided cost of the Third Circuit Option may be in the region of \$3.1 million per annum, based on a 40-year asset lifetime of TTU Projects 15-17. This analysis suggested that both demand-side and peaking generation options, in conjunction with thermally uprating the existing Islington–Kikiwa 220kV circuits, may have been a lower-cost solution, given the magnitude of the avoided cost for the Third Circuit Option.
- 3.4.7 At the time of the Commission’s consideration of this information in early October 2005, the Commission considered that the information supplied by Transpower supporting TTU projects 15-17 was insufficient. However, the Commission made an indicative decision to approve TTU Projects 15-17 (pending being satisfied that Tests A to C were met following the receipt of further information referred to in paragraph 3.4.8 below), because Transpower considered that:
- (a) the SVC Option would take at least 30 months to design and install; whereas
  - (b) the Third Circuit Option would take approximately 24 months to design and install and was already substantially advanced.
- 3.4.8 In order to be satisfied that Tests A to C were met before making its final decision on TTU Projects 15-17, on 7 October 2005 the Commission requested that Transpower:
- (a) re-submit economic analysis that recognises the economic benefits of reduced losses (and an explanation regarding how these have been

calculated) and any sunk costs (expenditure committed or incurred as at 14 April 2005);

- (b) provide the Commission with a more detailed cost breakdown for all proposed expenditure for the chosen investments and alternatives that Transpower had explored; and
- (c) discuss why Optical Ground Wire (**OPGW**) was included in the economic analysis supporting TTU projects 15-17.

*TTU Projects 15, 16 and 17 – Analysis of further information*

3.4.9 On 28 October 2005, Transpower provided responses to the Commission's 7 October 2005 request for further information about TTU projects 15-17.

3.4.10 In terms of question (a) at paragraph 3.4.8 above:

- (a) Transpower had not at that stage provided any indication regarding the amounts of expenditure already committed or incurred for TTU Projects 15-17 prior to 14 April 2005; and
- (b) Transpower had provided an explanation regarding the calculation of losses.<sup>8</sup>

3.4.11 The Commission has some doubt about the consolidated losses cost in Transpower's most recent supporting information. This information states that in 2006 the cost of losses with the SVC Option is \$3.3 million greater than the cost of losses for the Third Circuit Option.

3.4.12 In this instance, Transpower has calculated the loss differential at peak demand, halved this figure to apply some averaging effect and multiplied this by 7.5c/kWh<sup>9</sup>. Additionally, Transpower has applied some sensitivity to the cost of losses figure using a range of short run marginal costs (\$65/MWh to \$85/MWh). This analysis indicates that the difference in losses at peak between the SVC Option and the Third Circuit Option is 10MW. Given that the total losses at peak in the South Island during the 2006 winter peak period has been approximated at 130MW, this difference seems to be excessive.

3.4.13 With regard to question (b) at paragraph 3.4.8 above, Transpower has provided a detailed cost breakdown for the SVC Option, but has yet to provide a detailed cost breakdown of expenditure for the Third Circuit Option.

3.4.14 With regard to question (c) at paragraph 3.4.8 above, Transpower has stated that OPGW easement purchases would now be deferred to 2013-14 for the SVC Option.

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<sup>8</sup> The Commission is presently in the process of developing a methodology for the calculation of network losses to use in the application of the grid investment test. It is hoped that, in the future, this methodology will be adopted by both the Commission and Transpower when alternative projects are being compared economically.

<sup>9</sup> This is related to short run marginal cost of \$75/MWh.

3.4.15 Finally, a number of further projects were submitted for the Commission's approval on 31 October 2005 under rule 16. One of these projects has the objective of improving security at the Kikiwa 220kV bus to meet Transpower's current grid reliability standards, i.e. in order that a bus section fault will not adversely affect grid security. It is likely that the requirement for this bus security upgrade (total cost \$3.6 million) is a direct result of the third circuit installation and may need to be incorporated into the cost benefit analysis for the Third Circuit Option.

3.4.16 The Commission has performed further economic analysis based on supporting information provided by Transpower on 28 October 2005. In this analysis, sensitivity was applied to the cost of losses, the bus security upgrade at Kikiwa was included, and a range of SVC capital costs were explored. However, this analysis does not include sunk costs.

3.4.17 Table 4 below illustrates that the Third Circuit Option still seems the most economically attractive option even if:

- (a) a range of SVC costs from \$15 to \$25 million is included;
- (b) the Kikiwa bus section security project (\$3.6 million) is included; and
- (c) the losses costs are reduced to 25% of those supplied by Transpower.

SVC capital cost (\$000)	Third circuit NPV cost (\$000)	SVC option NPV cost (\$000)	Difference (\$000)
\$25,000	\$55,0006	\$60,745	\$5,739
\$20,000	\$52,464	\$56,378	\$3,913
\$15,000	\$49,922	\$52,010	\$2,088

**Table 4 NPV costs for third circuit and SVC option based on 25% loss figures and range of SVC capital costs**

3.4.18 In respect of the further information provided by Transpower for TTU Projects 15-17, whilst the Commission is not entirely satisfied with the detail of the information provided to the Commission, on balance, there is sufficient grounds to satisfy the Commission that Tests A to C have been met in respect of those projects.

*TTU Project 27 – Background and Assessment of Transpower information*

3.4.19 In its 12 September 2005 response to the Commission's letter of 5 August 2005, Transpower supplied an internal report which discussed a number of options to improve the security of supply into the Canterbury region.

3.4.20 Of these options, Transpower was seeking approval for the Islington–Livingstone 220kV circuit thermal uprating (TTU Project 23) and subsequent duplexing (TTU Project 27), and bussing the Islington–Timaru–Twizel 220kV circuit at Ashburton (TTU Project 28) for voltage stability reasons.

- 3.4.21 The Commission has already signalled to Transpower that it intends to approve 120MVAR of static reactive support in the Canterbury region (TTU Project 22) and the thermal upgrade of the Islington–Livingstone 220kV circuit (TTU Project 23).
- 3.4.22 With regard to TTU project 27, Transpower indicated that it plans to thermally uprate the Islington–Livingstone 220kV circuit to 70°C (TTU project 23) prior to the duplexing. The Transpower report stated that while it may introduce some difficulty at a later date when duplexing is required, raising the operational temperature to 80°C was in fact possible. This would defer the technical requirement of the Islington–Livingstone 220kV circuit duplexing until 2013 rather than 2009 if the thermal upgrade was only carried out to 70°C.
- 3.4.23 Based on Transpower’s information and further analysis, the Commission made an indicative decision to approve TTU Projects 27 and 28, subject to further clarification on two issues.
- 3.4.24 The first issue concerned the thermal upgrade of the line to 70°C rather than 80°C as referred to in paragraph 3.4.23 above.
- 3.4.25 Transpower has provided a short explanation (one paragraph on page 4 of the 28 October 2005 supporting information) of the reasons why an upgrade to 80°C was not carried out. The Commission considered that the explanation was very brief and lacked clarity for both technical and economic reasons.
- 3.4.26 After some discussion regarding this supporting information at a recent meeting, Transpower agreed to supply further explanation on the duplexing timing, based on the 70°C thermal upgrade.
- 3.4.27 Transpower has since supplied a spreadsheet net present value analysis and explanation (4 November 2005) which shows that the 80°C thermal upgrade, then subsequent duplexing is more economically attractive by approximately \$2 million.
- 3.4.28 The explanation of the spreadsheet also indicates that while the previous TTU supporting information describes that an 80°C thermal upgrade would delay the circuit duplexing to 2013, Transpower now states that this will be required in 2011. This change is due to an additional demand margin (approximately 70MW) being applied to the medium demand forecast.
- 3.4.29 Transpower has further explained that the thermal upgrade was not carried out due to the duplexing timing being driven solely by the necessity for a suitably long outage period. Transpower states in its 28 October 2005 supporting information that an outage window of at least four continuous weeks would be necessary due to the relatively long strain sections on the Islington–Livingstone 220kV circuit.
- 3.4.30 Transpower states that if the 80°C thermal upgrade was carried out and then duplexing subsequently carried out in 2011, it would be impossible to schedule a suitable outage window to allow this work to occur unless temporary diesel plant were utilised.

- 3.4.31 The outage window requirement, and the need for this in 2007, underpins both the project timing and thermal upgrade only to 70°C (as the required timing of the duplexing would render the 80°C thermal upgrade unnecessary).
- 3.4.32 Orion noted in its submission that even outages performed recently were difficult to manage operationally, and expressed concern about any delay in the requirement for further outages south of Christchurch.
- 3.4.33 The Commission notes that despite the fact that the 70°C re-tensioning may not have been the most efficient option, the work was completed in early 2005.
- 3.4.34 The Commission, therefore, accepts Transpower's explanations about the timing of the duplexing (TTU Project 27), but further notes that the Commission needs to discuss with Transpower how outage windows are to be managed in the future.

*TTU Project 28 – Background and Assessment of Transpower information*

- 3.4.35 Transpower's 12 September 2005 report illustrated that bussing the second Islington–Timaru–Twizel 220kV circuit at Ashburton in 2008 (TTU Project 28) delayed the necessity for SVCs in Canterbury by 100MVAR over the analysis period to 2018. Without bussing being carried out, the Transpower documentation also suggested that N-1 security limits would be breached by 2008 without the installation of static capacitance at Islington over the 2008-2010 period.
- 3.4.36 While the Commission agreed that it was clear that bussing the Islington–Timaru–Twizel 220kV circuit at Ashburton would improve voltage stability margins for any subsequent Islington–Ashburton or Ashburton–Timaru 220kV circuit outages, it was unclear if this was the least-cost solution to improve voltage stability margins when compared to other network augmentation options.
- 3.4.37 Transpower's analysis contained in the 12 September 2005 report illustrated that for the option containing TTU Projects 27 and 28, only three SVCs would be required by 2018 rather than four, without the bussing at Ashburton.
- 3.4.38 Transpower's analysis contained in the 12 September 2005 report suggested that numerous SVCs would be necessary in the years after both the Ashburton bussing and the Islington–Livingstone 220kV circuit duplexing. Preliminary economic analysis performed by the Commission, based on the SVC ratings, cost, and timing of installation provided by Transpower, indicated that TTU Projects 27 and 28 seem to achieve a least-cost solution when compared to the alternatives Transpower had investigated.
- 3.4.39 However, Transpower presented no analysis in the 12 September 2005 report about whether the proposed 100MVAR SVCs that were contained in the economic justification for TTU Projects 27 and 28 were the optimal plant rating or why these were required on the dates specified.

- 3.4.40 As a consequence, the Commission requested that Transpower more fully explore the costs, timing and optimal sizing associated with the SVCs noted in the 12 September 2005 report. The Commission considered that although SVC(s) had not been proposed and approval sought for IGE on SVC(s) as part of TTU Projects 27 and 28, the costs associated with these had been used as part of the economic justification for TTU Projects 27 and 28. Transpower was, therefore, requested to explore these issues more fully, both in terms of power systems analysis and economic analysis to check the optimal rating and timing for the investment.
- 3.4.41 In the 28 October 2005 supporting information, Transpower has indicated that it is planning to address the issues noted above, and plans to carry out this analysis in January 2006. Transpower considers that since SVCs have not been proposed as part of the TTU Application, this work is not critical to the Commission's decisions about TTU Projects 27 and 28.
- 3.4.42 The Commission agrees that TTU Project 28 will definitely improve the voltage stability margins into both Christchurch and the Upper South Island. While the information provided by Transpower is not complete, the Commission believes that the information before it is sufficient to justify a conclusion that Tests A to C have been met.

*TTU Project 18 – Background and Assessment of Transpower information*

- 3.4.43 In its 7 October 2005 response to Transpower, the Commission indicated that, after analysis, it considered that TTU Project 18 should be classed as Category A, and may be approved.
- 3.4.44 Previously the Commission considered TTU Project 18 as Category B (customer-specific). The rationale underpinning the Commission's decision to previously consider TTU Project 18 on that basis was that removal of the Blenheim–Argyle 110kV circuit in conjunction with TTU Project 18 would define the Blenheim–Stoke 110kV circuits as connection assets under Transpower's current Transmission Pricing Methodology (**TPM**). The customer would then be charged accordingly and this would also be the case in the future if a similar definition of connection assets continued.
- 3.4.45 To progress a decision on this TTU project, the Commission performed additional analysis to determine whether the least cost solution included retaining the existing Blenheim–Argyle 110kV circuit. This analysis was based solely on a comparison of avoided maintenance costs and the approximate cost of additional transmission losses if the Blenheim–Argyle 110kV circuit was removed.
- 3.4.46 Based on Transpower's pole line maintenance cost recovery rate, set out in its present TPM, and the length of the Blenheim–Argyle 110kV circuit, the avoided maintenance cost in future years was approximated by the Commission to be less than the increased transmission losses should the line be removed.

- 3.4.47 This preliminary Commission analysis suggested that TTU Project 18 should include the retention of the Blenheim–Argyle 110kV circuit, and was, therefore, considered to be Category A, rather than Category B.
- 3.4.48 On 31 October 2005, Transpower has submitted to the Commission a further set of upgrade projects to be considered under rule 16. This application contains two interconnecting transformer upgrades in the upper South Island region that may materially affect the economics of TTU Project 18, if this was to be compared with alternatives.
- 3.4.49 These upgrades are the replacement of the 220/110kV interconnecting transformers at both Stoke and Kikiwa (\$9.2 million). Transpower seems to have carried out the needs analysis for these upgrades based on the assumption that TTU Project 18 has not been carried out. The addition of a second Blenheim–Stoke 110kV circuit (TTU Project 18) will affect the need for these two interconnecting transformer upgrades and further questions need to be asked of Transpower regarding the coordination of all these projects.
- 3.4.50 The Commission decided that in light of the 31 October 2005 upgrade project proposals, TTU Project 18 should now be considered as Category C, and considers that it should request further information from Transpower regarding TTU Project 18 and the two interconnecting transformer upgrade proposals at Stoke and Kikiwa.
- 3.4.51 In addition, the submission from the Major Electricity Users' Group (**MEUG**) states that "*the proposed solution has a high cost in terms of \$/MVA and so alternatives may be more efficient*" and that "*the Commission should ask whether these alternatives have been assessed and what the results were*".
- 3.4.52 The Commission has written to Marlborough Lines Limited, Transpower, and MEUG to discuss these issues further before finalising its decision with respect to TTU Project 18.

### **3.5 Customer-specific TTU projects 7 and 29**

- 3.5.1 The Commission made an indicative decision to approve Category B TTU Projects 7 and 29, provided that Transpower was able to provide evidence that the affected customers have agreed to pay the charges that could be anticipated to result from the proposed investments.
- 3.5.2 The Commission received no submission from the affected customers for these two projects during the recent consultation. In addition, Transpower's further information provided on 28 October 2005 does not refer to any customer agreement to pay the charges that would result from TTU Projects 7 and 29.
- 3.5.3 The Commission has had further discussions with Transpower in early November 2005 about these projects and understands that Transpower is negotiating with these parties. Given that a bilateral arrangement between Transpower and the connected party is desirable, the Commission considers that it is not open to the Commission to approve such expenditure under the

transitional provisions without confirmation from the specific customers involved. The Commission notes the extensive comments set out in Transpower's submission on the matter of investment contracts. The response to these comments is discussed later in this paper.

## 4 ANALYSIS OF SUBMISSIONS

4.1.1 By 31 October 2005, the closing date for submissions, submissions from the following parties had been received:

Retailer / Generator	Distributors	Transmission	End Users
Meridian Energy Mighty River Power (MRP)	Northpower Vector Orion	Transpower	Comalco Major Electricity Users' Group (MEUG) Jackson Electrical Industries

**Table 5: Breakdown of submitters**

4.1.2 Submitters were generally supportive of the Commission's pragmatic approach to the TTU Application. There were a number of specific comments about the Commission's application of the tests under rule 16 and some more general comments about the process both the Commission and Transpower have followed regarding the application.

4.1.3 The main issues raised were:

- (a) the application of Test A: meaning of "proposed" and committed expenditure;
- (b) the application of Test B: other options;
- (c) the application of Test C:
  - (i) the reliability standards used;
  - (ii) customer specific projects/investment contracts;
  - (iii) investments proposed for dry year reasons and "economic" investments; and
  - (iv) concerns about specific projects; and
- (d) general comments:
  - (i) lack of information provided by Transpower throughout the process;
  - (ii) Transpower's process for consultation;
  - (iii) transparency of Commission's process to consider the TTU Application;
  - (iv) difficulties in obtaining outage windows and constraints on contractor resource; and

- (v) possible need for resource consents for re-tensioning and thermal upgrades.

## 4.2 Application of Test A: meaning of “proposed” and of committed expenditure

- 4.2.1 Most submitters commented on the Commission’s approach to Test A, and, in particular, the issue of expenditure which has already been committed or incurred by Transpower.
- 4.2.2 Transpower’s submission analyses the wording of rule 16 in great detail and suggests that it believes *“it is open to the Commission to adopt a more purposive approach to rule F-III-16 that recognises the transitional nature of that provision, which would allow the Commission to retrospectively approve particular historical expenditure”*<sup>10</sup>. Transpower suggests that the concept of “proposed” should be interpreted as the *“act of putting expenditure before the Commission and seeking approval”*<sup>11</sup> and that the nature of a transitional regime suggests that a transitional regime for approving interim grid expenditure would be backward looking as well as forward looking. In the event that the Commission still decides it cannot approve incurred or committed expenditure, Transpower has proposed rule changes that it believes would allow the Commission to retrospectively approve interim grid expenditure.
- 4.2.3 Transpower’s viewpoint is echoed by Genesis which believes that *“too much emphasis has been placed on the word ‘proposed’”*<sup>12</sup>. Genesis considers that the Commission has a discretion in the approval process and Genesis states *“Simply because the work has been completed does not, in Genesis Energy’s view, preclude its consideration”*<sup>13</sup>. Indeed, Genesis goes on to say that it would *“support an approach to the Commerce Commission requesting relaxation of the cpi-x regime to allow Transpower to recover what would have been the Electricity Commission approved portion of the investments via the pricing methodology”*<sup>14</sup>.
- 4.2.4 However, MEUG and Orion put forward a different view. Instead of the Commission’s approach of considering that it is unable to approve any expenditure committed or incurred before the application date, MEUG suggests that *“expenditure actually incurred or committed before the **approval date** [emphasis added] might also be a reasonable interpretation”*. Orion states that the *“use of the word “proposed” clearly contemplates future expenditure only”* and notes that the *“key issue appears to be Transpower’s concern over payment”*. Orion points out that whilst it is sympathetic to Transpower’s concerns, the challenge of investing without certainty of revenue recovery is *“faced by all distributors, none of whom have a guarantee of payment like Transpower, yet still have to invest”*.

<sup>10</sup> Transpower submission, 28 October 2005, p1

<sup>11</sup> Transpower submission, 28 October 2005, p6

<sup>12</sup> Genesis submission, 28 October 2005, p3

<sup>13</sup> Genesis submission, 28 October 2005, p3

<sup>14</sup> Genesis submission, 28 October 2005, p5

4.2.5 Comalco states that it sees the issue as one of process. It considers that the Commission would likely have *“approved the expenditure in question...had the application been lodged sufficiently early”* and that Transpower *“essentially has not complied with the transitional provisions”*. Comalco considers in its submission *“whether the penalty that Transpower should face for its failure to comply is the cost of committed expenditure. On balance Comalco believes that such a penalty would be excessive and that it “would support a rule change to enable the Commission to approve interim grid expenditure, which was committed prior to 14 April 2005, if that expenditure would have been approved had an application been lodged sufficiently early”*.

4.2.6 Northpower considers that *“the Interconnection Charges are the most appropriate method for Transpower to recover the costs of all cost-effective projects that enhance the Upper North Island summer security or the Upper North Island winter security”*.

*Commission response*

4.2.7 The main issue for the Commission here is the general policy towards approval of expenditure which has already been committed or incurred.

4.2.8 The Commission notes that Transpower’s Board made the decision to proceed with some of these projects in October 2003, before part F was promulgated. Transpower’s Board believed that these projects were needed and committed the expenditure required to build and commission them. This was before the regulatory regime regarding transmission investment was developed. The Ministry of Economic Development’s (MED’s) documentation about transmission in a regulated environment was published in July 2003<sup>15</sup> but the detailed consultation paper was published in November 2003 and it was May 2004 before part F came into force.

4.2.9 The Commission has also had regard to the suggestion by MEUG of a more onerous interpretation of Test A. The Commission considers that such an onerous interpretation would not be consistent with the intention of the MED when it drafted the transitional provisions, particularly given that it set a timetable of six weeks for the Commission to consider each application and the further information provided in support of each application.

4.2.10 The Commission notes the comments by Genesis, Transpower, and others about the context for the transitional provisions and has particularly considered Comalco’s comments about Transpower’s perceived failure to follow process and any penalty that should result from that perceived failure.

4.2.11 Given the nature of the transitional provisions, whilst the Commission can only make a decision to approve or decline the expenditure proposed on the basis of rule 16 as it stands now, it is persuaded to consider progressing a rule change proposal to address this issue. It will consider the rule change proposed by Transpower in its submission when it looks at the practicable options for the objective of the rule change.

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<sup>15</sup> <http://www.med.govt.nz/ers/electric/establishment/transport-consultation/index.html>

4.2.12 If the rule change proposal is approved by the Minister following consultation with interested parties, the Commission does note a potential risk for Transpower if it chooses to proceed with a project as far as commissioning before seeking the Commission's approval for expenditure on that project. It is possible that the Commission may determine that the project does not meet the tests under the Rules and that it is unable to approve the expenditure applied for on the project regardless of the physical state of completion of that project.

### 4.3 Application of Test B

4.3.1 Vector expressed a view in its submission that it believed the Commission's approach to Test B, comparing the level of capex proposed against the average spend over the last five years, was inappropriate. Vector's reasons for this are that *"over the last 15 years Transpower's investment in the grid has been limited, setting an artificially low baseline for the Commission's test"*<sup>16</sup>. Further, Vector suggests that the Commission form *"a view as to the appropriateness of utilising the IGE mechanism by looking at the nature of the projects planned, rather than reflecting on the amount of capex, relative to previous periods"*.

4.3.2 MEUG's concerns with respect to Test B are about the differences between the *"historical capital expenditure advised by Transpower as listed in appendix 2 of the consultation paper"* and the *"purchase of fixed assets reported by Transpower in their Cash Flow statements"*. MEUG believes that *"without a reconciliation there will be doubts about the extent to which the proposed TTU can reasonably be considered as being in addition to historic ongoing normal grid expenditure"*. MEUG then presents a table showing the differences between the two sets of figures over the past six years.

4.3.3 Comalco's concerns are about the *"lack of a definition of what constitutes normal ongoing grid expenditure"*. It states that *"Condition 1 is arguably of not much use given the recent historical under-spend on the grid. Therefore, proposed expenditure in excess of the recent historical trend is likely to include catch-up expenditure that should normally have occurred in prior years. Hence applying Condition 1 is likely to overstate the amount of expenditure that should be covered by these transitional provisions"*. It suggests a different test *"along the lines of expenditure that improves the capacity of the grid at specific points or along specific circuits by at least ten percent (or another agreed figure)"*.

#### *Commission response*

4.3.4 The Commission notes the concerns raised here, particularly the difficulties of applying such a generic phrase as *"normal ongoing grid expenditure"*.

4.3.5 The Commission believes that the alternative test suggested by Comalco appears to be about additional capacity rather than additional financial spend.

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<sup>16</sup> Vector submission, 31 October 2005, p3, para 13

- 4.3.6 Vector's suggestion appears to refer to the second limb of Test B set out in paragraph 3.3.1(b), which the Commission agrees is one aspect that it must consider to determine whether rule 16.2.2 has been satisfied. However, the nature of the projects (as well as the level of expenditure) can be viewed differently depending on whether a medium or long-term view is taken. The Commission considers that, on the basis of the information provided, there are sufficient grounds for it to be satisfied that the proposed expenditure is additional to Transpower's normal ongoing grid expenditure. This is consideration is for the purposes of the TTU Application when such expenditure is compared with the absence of such programmes over the past decade.
- 4.3.7 The Commission notes the concerns raised by MEUG and has asked Transpower for an explanation for the difference in the figures. However, this is something that the Commission believes would be further scrutinised by the Commerce Commission as part of the thresholds regime under Part 4A of the Commerce Act 1986, rather than a matter that would take the expenditure outside the realm of Test B.

#### **4.4 Application of Test C – reliability standards used**

- 4.4.1 The comments received about Test C were either about the reliability standards used, or about the results of the Commission's application of the test and the categorisation that resulted.
- 4.4.2 In the Consultation Paper, the Commission stated that it considered that "the drafter's intention in using the word "current" was to apply the grid reliability standards as applicable to Transpower at the time of an application for interim grid expenditure under rule 16". However, due to the indeterminate nature of the core grid determination, the Commission stated that it has "*considered whether rule 16 requires it to use the "Main Transmission Planning Guidelines" document provided by Transpower as Transpower's current grid reliability standards*". The Commission concluded that "*the choice of either grid reliability standard is not likely to have a significant impact on the outcome of decisions regarding the TTU Projects*" and that consequently, "*it is open to the Commission to take the view that it assess the proposed TTU Application against either reliability standard and concludes that the meaning given to "Transpower's current grid reliability standards" is not determinative of its decision whether to approve the IGE*".
- 4.4.3 Vector states that although Transpower's "Main Transmission Planning Guidelines" are referred to as grid security standards throughout the document, "*when queried, Transpower consistently asserts that these guidelines are just that and not standards*". Vector also compares the list of TTU Projects with the Commission's recent proposal for the core grid determination, published on 21 October 2005.
- 4.4.4 Meridian puts forward its views about the projects to upgrade the lines between Bunnythorpe and Haywards (TTU Projects 9-13) and asserts that these upgrades "*should be approved on the grounds of improving dry year security and that it is reasonably prudent and necessary to meet Transpower's*

*current grid reliability standards*". Meridian highlights section 2.3.2 of Transpower's "Main Transmission Planning Guidelines"<sup>17</sup> (below) and concludes that "*dry year security should be covered within the scope of the current grid reliability standards*".

- 4.4.5 MRP considers that the Commission's interpretation of reasonably prudent or necessary as meaning the least cost option has resulted in a "*higher hurdle test than any plain English reading of 'reasonably prudent or necessary'*". MRP goes on to states that its interpretation is that the test is "*about ensuring that investment needed to meet grid reliability standards is made, rather than necessarily ensuring the investment is the most efficient option*".
- 4.4.6 MEUG agrees with the Commission's approach to the test under rule 16.2.3.1, subject to two caveats. MEUG considers that the "*GRS should be that applying at the time of the approval rather than the date of application or the situation could arise of approving investments that under the GRS operable at the time are not required*". MEUG also considers that "*the test needs to ensure non-transmission options are considered*" to ensure efficient outcomes.

#### *Commission response*

- 4.4.7 The Commission notes that if specific dispatch outcomes are provided to justify projects as reliability investments, then clearly an alternative generation dispatch would be the least cost means of meeting reliability requirements. Therefore, this then becomes an economic question as to whether the transmission investment is appropriate.
- 4.4.8 The Commission considers that the requirement that IGE approved under rule 16 be, among other things, "reasonably prudent", incorporates the requirement to consider other, lower cost options, for meeting Transpower's current grid reliability standards. The Commission disagrees with MEUG's suggestion that the reliability standards in place at the time of approval should be the ones against which the Commission tests the proposals. The Commission believes that this would put Transpower in a position where its investment proposals would be examined on the basis of reliability standards that may not be the same as those under which it undertook its analysis. In this case, the Commission continues to believe that the TTU Projects in Category A would most likely meet the requirements of rule 16.2.3.1 under either the requirements of Transpower's "Main Transmission Planning Guidelines" or the requirements of the economic limb of the grid reliability standard.

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<sup>17</sup> "simulation studies shall be carried out for the worst case credible generation dispatch scenarios. For hydro generation (New Zealand's main source of electricity), these include dry, average and wet hydrological scenarios."

#### 4.5 Application of Test C – customer specific projects / investment contracts

4.5.1 Transpower has made substantial comments about the Commission's approach to Test C with respect to customer-specific investments. Transpower is *"concerned that the Commission's favoured approach appears to be to promote and rely primarily on investment contracts agreed bilaterally with transmission counterparties"*. *"Transpower's view is that the design of Part F was intended to facilitate investment in transmission, including investment in connection assets in those circumstances where investment was reasonably required to maintain grid reliability standards and meet the needs of end use customers, even where the transmission counterparty...is unwilling to pay the costs of the investment."* Transpower believes that this approach runs *"contrary to the underlying intent of the rule and the GPS<sup>18</sup>, by not effectively protecting the interests of end-consumers and creating the potential for investor hold-out to the detriment of a wider group of consumers"*.

4.5.2 Genesis states that *"In principle, if the upgrade is required to meet a single customer's load growth requirements then that customer should pay, otherwise the investment should be recovered as a security upgrade."*

##### *Commission response*

4.5.3 The Commission considers that it should not interfere in bilateral arrangements between consenting parties. If proposed investments are the subject of an investment contract, Transpower already has a secure revenue stream by virtue of the contract. If they are not, then Commission considers that the relevant customer should be involved in the decision-making and, in particular, the consideration of whether there are any lower cost alternatives that would better meet their needs than the proposed transmission investment.

#### 4.6 Application of Test C – economic investments

4.6.1 Meridian submits that it *"is concerned that the Commission does not intend to approve a number of projects that would result in an upgrade to the central North Island corridor"* and goes on to set out four issues that it believes the Commission should consider:

- (a) the number and capacity of new generation projects in the lower North Island over the next few years;
- (b) the ability to obtain outage windows to carry out construction and maintenance;
- (c) the impact of central North Island AC constraints on HVDC power flows and potential South Island hydro spill given the likely impact of wind generation in the lower North Island; and
- (d) security of supply benefits during dry years.

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<sup>18</sup> Government Policy Statement on Electricity Governance October 2004

- 4.6.2 Transpower echoes this and states that while it *“still believes those projects to be reliability investments, it will resubmit the projects concerned under a GUP as economic investments”*.
- 4.6.3 Comalco, meanwhile, states that it *“is pleased that the Commission analysis has been sufficiently robust to identify projects that do not comply with the requirements of the transitional provisions (Category D)” and “Category D expenditure should not be approved, but should be considered as part of the GUP”*.
- 4.6.4 MEUG supports this view and states that it *“agree[s] with the approach...that while these projects do not meet the IGE criteria they may meet the net market benefits test in the grid investment test and therefore Transpower could consider resubmitting some/all for the first full GUP round”*.

*Commission response*

- 4.6.5 The Commission notes that it has not said that it will not approve the projects, but that it does not believe that they comply with the requirements under rule 16. It has, therefore, asked Transpower to re-submit the investments as economic investments for consideration in the GUP. Transpower did this on 31 October 2005 when it submitted Volume IV of the GUP. The Commission’s consideration of those proposed investments is progressing in accordance with the processes set out in rule 14. The Commission also notes its view set out in paragraph 4.4.7 of this paper.

#### **4.7 Application of Test C – questions about specific projects**

- 4.7.1 MEUG made some specific comments about certain investments that the Commission had made an indicative decision to approve and suggest that these investments should be placed into Category C and further information requested of Transpower.
- 4.7.2 For TTU Projects 4 and 5, MEUG notes that *“in the past, Transpower has used a tender process to identify the available alternatives to provide voltage support and to select the least cost option”*. MEUG suggests that *“the Commission should ask whether Transpower has conducted tenders to ensure its options are least cost”*.
- 4.7.3 MEUG comments that an alternative to the capacitor banks at Stoke (TTU Project 14) would be to *“enforce power factor limits and encourage power factor correction at the demand level”* because the *“economics usually favour local power factor correction initiatives over grid connection”*.
- 4.7.4 Thirdly, MEUG questions whether TTU Project 18 to string a 110kV circuit on an existing line is for a specific customer (and, therefore, a Category B project). It considers that *“the proposed solution has a high cost in terms of \$/MVA”* and that *“alternatives [such as peak demand management, inter-trips and local generation] may be more efficient”*.

- 4.7.5 Finally, MEUG questions whether alternatives such as “*new fast acting transmission electronics*” have been assessed for TTU Projects 23-28.

*Commission response*

- 4.7.6 Regarding TTU Projects 4 and 5, the Commission would expect Transpower to have efficient processes for the procurement of such investments that would minimise their cost.
- 4.7.7 The Commission agrees with MEUG’s points about the economics of local power factor correction. Power factor issues have recently been discussed with the Transmission Advisory Group (**TAG**). However, such issues may take a long time to resolve and the Commission considers that the information provided gives sufficient grounds for the Commission to consider that TTU Project 14 meets the requirements of rule 16 in the meantime.
- 4.7.8 The Commission is mindful of the very real need to augment capability into the Marlborough region in the near future, but it does share MEUG’s concerns about TTU Project 18. The Commission also notes that, on 31 October 2005, Transpower submitted a new application under rule 16 for expenditure to replace the Kikiwa and Stoke 110/220kV interconnecting transformers with 150MVA units at a total cost of \$9.2m. The requirement for this investment also appears to be influenced by the level of off-take demand at the Blenheim GXP. The Commission has, therefore, asked for further information from Transpower, Marlborough Lines Company and MEUG itself, in order to be able to come to a decision about this project.
- 4.7.9 The Commission notes that MEUG also believes the TTU Projects 23-28 are “*low cost in a \$/MVA sense*”. The Commission considers that TTU Projects 23-28 are low cost projects that deliver reliability benefits for customers as well as meeting the requirements in rule 16.

#### **4.8 General comments**

- 4.8.1 Vector made some comments about Transpower’s method of consulting with the industry about the proposed TTU Projects. It noted that Transpower’s “*communication comprised high-level presentations in multi-party forums*” and does not believe that “*such generic, one-way communication...can be compared to consultation*”. Vector also undertook some analysis in relation to the progression of the projects between November 2003, when they were first announced and April 2005, when Transpower made the TTU Application.
- 4.8.2 Several parties also made comments about the level of information that appeared to be required by the Commission and the level of detail provided by Transpower.
- 4.8.3 Vector said that “*the information and analysis disclosed by Transpower and made publicly available by the Commission is not, in [Vector’s] view, sufficiently detailed or robust to ensure a sound decision can be made*”. Orion “*considers that Transpower should provide adequate and specific information for the Commission to reach a conclusion as to whether it accepts or rejects*

*any TTU proposal. We also consider the Commission was correct to request additional information from Transpower to clarify its application”.*

- 4.8.4 However, some parties had the opposite view. Genesis considers that *“there appears to be little transparency regarding the Electricity Commission’s requirements in assessing and approving transmission upgrades”*. MRP said that *“the principles of the GPS...in regard to tactical transmission upgrades, will be best met by a clear and transparent process for assessing and approving transmission investments”* and considers that *“some of the detail requested by the EC is unnecessary”*.
- 4.8.5 Jackson Electrical Industries made a short submission focussed on the proposed thermal upgrade on the Otahuhu-Henderson line. It states that this is *“grey technology”* and that it is *“effectively running the lines with a current loading higher than the original manufacturers [sic] ratings and the values consented by the local territorial authority”*. It considered that *“when a line is operated at a value higher than the consented value the territorial authorities and the affected landowners must be consulted and permission obtained including the establishment of a legal easement”*.
- 4.8.6 Several parties made comments about future constraints facing the industry regarding the availability of competent technical resources to actually carry out the upgrade work. Vector commented that *“New Zealand is currently experiencing a skill and resource shortage with respect to network build and maintenance”*.
- 4.8.7 Orion raised concerns about the ability to maintain grid security whilst the outages required to carry out the upgrade work are occurring. Meridian also made this point and considered that *“the Commission should note the issues associated with planning outages and the associated demand reductions required for the tactical transmission upgrades into Christchurch that have taken place in recent weeks”*.

#### *Commission response*

- 4.8.8 The Commission acknowledges that the process for approving transmission investment under part F is new to both the Commission and Transpower; therefore, it is going to take some time to work through the initial processes. The Commission is confident that the more recent applications for IGE under rule 16 will progress more smoothly.
- 4.8.9 The Commission does not agree that thermal upgrade work is a “grey technology”. Such practices are well established internationally and are used as a low cost means to obtain more use from existing assets. The Commission sees this as, essentially, very good value for money.
- 4.8.10 The Commission notes the comments by Orion and others about difficulties in obtaining outage windows to carry out maintenance and upgrade work. It may be that alternative arrangements such as portable diesel generation and bypass towers may be required to deal with this issue in the future. The Commission understands that some distribution companies sometimes use

portable generation units in their distribution networks when carrying out such work.

## 5 APPROVAL AMOUNTS

- 5.1.1 Transpower states in its letter of 12 September 2005 that the “*budget project costs in the TTU application were the expected and not the maximum costs for the projects*” and that “*Transpower sought approval for the actual costs of the projects*” (whatever these turn out to be), and has “*provided the best possible estimates [of the project costs available] at the time*”.
- 5.1.2 The Commission notes that, based on conventional regulatory practice, approval for recovery of costs from customers should be for the *lesser* of either the amount for which approval is sought or the actual cost of the project (which could be supported no doubt by audit certificates). The Commission considers this approach desirable, both to ensure transparency, and to ensure that Transpower faces appropriate incentives to both correctly represent the cost of projects to the Commission and also to efficiently execute the projects.
- 5.1.3 The amount that will be charged to customers is not intended to be immediately subject to ODV, so could, therefore, be either historic cost or, in later years, indexed historic cost (if appropriate). In either case, the starting point would be the nominal cost at the date the project was commissioned (for example, the estimate of the Auckland 400kV project given by Transpower is \$460m in 2005 dollars, but the nominal project cost in 2010 dollars is estimated to exceed \$600m). It is, of course, the (\$600m) nominal cost at project completion that is to be recovered from customers as the historic cost through the TPM.
- 5.1.4 The Commission believes that to approve the actual costs of the project, on the basis of the budgeted costs, would, in effect, be giving Transpower a ‘blank cheque’ and poor incentives to efficiently manage project costs after receiving Commission approval.
- 5.1.5 The Commission, therefore, agreed that that any amounts of IGE approved under rule 16 would be the lesser of the approved amount or the actual nominal cost of the project at the time of commissioning (i.e. the capitalised book value).
- 5.1.6 However, the Commission notes that ultimately, the decision on whether these costs can be recovered from customers will rest with the Commerce Commission.

## 6 COMMISSION FINAL DECISIONS

- 6.1.1 The Commission has considered the issues raised in submissions, and the further information provided by Transpower on 28 October and 4 November 2005. On the basis of the information provided to it, the Commission made the following decisions in respect of the TTU Application at its 8/9 November 2005 Board meeting:

- (a) agreed to approve the amount of interim grid expenditure contained in column 10 of the table in the appendix to this paper for Category A TTU projects;
- (b) agreed, in respect of TTU Project 18, to:
  - (i) seek further information regarding Transpower's consideration of alternatives for this project; and
  - (ii) consider the impact on TTU Project 18 of the new application for interim grid expenditure, received on 31 October 2005, for new interconnecting transformers at Stoke and Kikiwa; and
- (c) agreed to decline to approve interim grid expenditure for Category D TTU Projects 9-13 under rule 16 as the Board considers that these are not reasonably prudent or necessary to meet Transpower's current grid reliability standards. However, the Commission noted that Transpower submitted these investments for approval as Volume IV of the GUP on 31 October 2005.

6.1.2 The Commission can only make decisions on the basis of the rule 16 as it currently stands. Therefore, it confirms its belief that it can only approve those amounts which had not been committed or incurred as at 14 April 2005, this being the date of application.

6.1.3 However, the Commission agreed that the comments in submissions regarding approval of committed or incurred expenditure within the context of the transitional regime have merit. As a result, it will develop a rule change proposal to address this issue and consult with interested parties in due course.

6.1.4 On 15 November 2005, Transpower provided the Commission with copies of letters from PowerCo and Alpine Energy in respect of TTU Projects 7 and 29 that agreed to pay the charges that would result from those investments. The information in these letters allowed the Commission to approve IGE for these projects on 18 November 2005.

6.1.5 A full list of the projects, along with the amounts approved, can be found in the appendix to this paper.

6.1.6 In light of the questions raised by MEUG in its submission and information contained in Transpower's new set of applications under rule 16 that were received on 31 October 2005, the Commission has yet to make a final decision in respect of TTU Project 18. It has sought further information from Transpower, Marlborough Lines Company, and MEUG about this proposed investment and the related investments under Transpower's new application under rule 16.

6.1.7 Rule 17.3 requires the Commission to advise the Commerce Commission within 10 business days of making any decision to approve interim grid

expenditure under rule 16<sup>19</sup>. The Commission wrote to the Commerce Commission on 15 November 2005 and 18 November 2005 to advise it of the Commission's decisions with respect to the TTU Application.

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<sup>19</sup> This also applies to any decisions to approve reliability or economic investments proposed in a Grid Upgrade Plan.

## Appendix: Summary table of projects and Commission's decisions

1	2	3	4	5	6	7	8	9	10
TTU Project number	Grid Upgrade Project	Pre Upgrade Capacity	Post Upgrade Capacity	Completion Date	Interim grid expenditure applied for 14/4/05	Actual and committed expenditure to 14/04/05	Amount able to be approved by the Board	Category	Amount approved by the Board
1	Thermal upgrade of 220kV OTA – HEN circuits 1&2	695/765MVA (Sum/Win)	938/984MVA (Sum/Win)	Apr 2006	\$2.300 million	\$2.194 million	\$0.106 million	A	\$0.106 million
2	Thermal upgrade of 220kV OTA – PEN circuits 5&6	330/370MVA (Sum/Win)	469/492MVA (Sum/Win)	2006	\$0.700 million	\$0.263 million	\$0.437 million	A	\$0.437 million
3	Thermal upgrade of 220kV HLY – OTA circuit 1	404/492MVA (Sum/Win)	614/671MVA (Sum/Win)	Completed	\$1.700 million	\$1.332 million	\$0.368 million	A	\$0.368 million
4	2 x 50MVAr 110kV shunt capacitors at PEN	NA	50MVAr	May 2006	\$2.400 million	\$0.008 million	\$2.392 million	A	\$2.392 million
5	1 x 50MVAr 110kV shunt capacitors at HEP	NA	50MVAr	May 2006	\$1.400 million	\$0.006 million	\$1.394 million	A	\$1.394 million
6	Thermal upgrade of 110kV BOB – OTA circuits 1&2	63/77MVA (Sum/Win)	92/101MVA (Sum/Win)	May 2005	\$0.800 million	\$0.536 million	\$0.264 million	A	\$0.264 million
7	Thermal upgrade of 110kV HAM – WHU circuits 1&2	101/123MVA (Sum/Win)	154/168MVA (Sum/Win)	Completed	\$0.720 million	\$0.607 million	\$0.113 million	A	\$0.113 million
8	Thermal upgrade of 110kV TGA – TRK circuit	63/77MVA (Sum/Win)	76/88MVA (Sum/Win)	Dec 2005	\$0.250 million	\$0.066 million	\$0.184 million	A	\$0.184 million
9	Thermal upgrade of 220kV WRK – PPI - WKM 220kV circuit	239/291 & 289/332MVA (Sum/Win)	421/449MVA (Sum/Win)	Completed	\$1.650 million	\$1.606 million	\$0.044 million	D	0

**ELECTRICITY COMMISSION**

**TTU Summary of Submissions and Final Decisions**

1	2	3	4	5	6	7	8	9	10
TTU Project number	Grid Upgrade Project	Pre Upgrade Capacity	Post Upgrade Capacity	Completion Date	Interim grid expenditure applied for 14/4/05	Actual and committed expenditure to 14/04/05	Amount able to be approved by the Board	Category	Amount approved by the Board
10	Thermal upgrade of 220kV TKU – WKM circuits 1&2	244/281MVA (Sum/Win)	307/355MVA (Sum/Win)	Apr 2006	\$6.400 million	\$0.602 million	\$5.798 million	D	0
11	Thermal upgrade of 220kV RPO – WRK circuit	239/292MVA (Sum/Win)	364/397MVA (Sum/Win)	Apr 2006	\$3.200 million	\$0.267 million	\$2.933 million	D	0
12	Thermal upgrade of 220kV BPE – TKU circuits 1&2	202/246MVA (Sum/Win)	307/355MVA (Sum/Win)	Apr 2008	\$8.500 million	\$0.000 million	\$8.500 million	D	0
13	Thermal upgrade of 220kV BPE – HAY circuits 1&2	202/246MVA (Sum/Win)	307/355MVA (Sum/Win)	Apr 2006	\$4.800 million	\$1.220 million	\$3.580 million	D	0
14	40MVA capacitor banks at Stoke substation.	NA	Increase power transmission capability into region by 30MW	Apr 2005	\$1.450 million	\$1.150 million	\$0.300 million	A	\$0.300 million
15	String 220kV circuit between Islington and Kikiwa utilising existing tower line including easements	NA	Increase power transmission capability into region to 320MW	May 2006	\$32.500 million	\$0.781 million	\$31.719 million	A	\$31.719 million
16	Establishment of a new 220/33/66kV supply at Culverden	NA	2 x 30MVA transformers	May 2006	\$5.000 million	\$0.387million	\$4.613 million	A	\$4.613 million
17	Establishment of a new 220/66kV interconnection at	NA	2 x 80MVA transformers	May 2006	\$7.200 million	\$2.952 million	\$4.248 million	A	\$4.248 million

1	2	3	4	5	6	7	8	9	10
TTU Project number	Grid Upgrade Project	Pre Upgrade Capacity	Post Upgrade Capacity	Completion Date	Interim grid expenditure applied for 14/4/05	Actual and committed expenditure to 14/04//05	Amount able to be approved by the Board	Category	Amount approved by the Board
	Waipara								
18	String 110kV circuit to Blenheim utilising existing tower line including easements	NA	Increase power transmission capability into Blenheim to 130MW	May 2006	\$20.200 million	\$1.453 million	\$18.747 million	B/C	Decision outstanding
19	Convert Dobson – Inangahua to 110kV and new 110/66kV transformer at Dobson	33/41MVA (Sum/Win)	56/68MVA (Sum/Win)	Apr 2005	\$3.200 million	\$2.274 million	\$0.926 million	A	\$0.926 million
20	Second Dobson – Inangahua 110kV circuit	NA	NA	Apr 2007	\$0.260 million	\$0 million	\$0.260 million	A	\$0.260 million
21	Second 110/66kV transformer at Dobson	NA	75 MVA	Apr 2007	\$2.700 million	\$0 million	\$2.700 million	A	\$2.700 million
22	Islington 220kV capacitor banks	NA	2 x 60MVAr	Apr 2005	\$3.100 million	\$3.004 million	\$0.096 million	A	\$0.096 million
23	Thermal upgrade of Islington-Livingston 220kV circuit	202/247MVA (Sum/Win)	307/335MVA (Sum/Win)	Apr 2005	\$1.600 million	\$1.750 million	\$0 million	A	\$0 million
24	Thermal upgrade of Islington-Tekapo B-Twizel 220kV circuit	404/493MVA (Sum/Win)	523/591MVA (Sum/Win)	Dec 2005	\$3.800 million	\$0.430 million	\$3.370 million	A	\$3.370 million
25	Thermal upgrade of Islington-Timaru-Twizel 220kV circuits 1&2	478/583MVA (Sum/Win)	619/699MVA (Sum/Win)	Dec 2005	\$3.800 million	\$0.277 million	\$3.523 million	A	\$3.523 million
26	Southbrook 66kV capacitor bank	NA	38 MVAr	Dec 2006	\$1.200 million	\$0.016 million	\$1.184 million	A	\$1.184 million

1	2	3	4	5	6	7	8	9	10
TTU Project number	Grid Upgrade Project	Pre Upgrade Capacity	Post Upgrade Capacity	Completion Date	Interim grid expenditure applied for 14/4/05	Actual and committed expenditure to 14/04/05	Amount able to be approved by the Board	Category	Amount approved by the Board
27	Duplexing of Islington-Livingstone 220kV circuit	202/246MVA (Sum/Win)	403/492MVA (Sum/Win)	May 2007	\$25.800 million	\$0.264 million	\$25.536 million	A	\$25.536 million
28	Bussing of Christchurch-Twizel Line A at Ashburton	NA	NA	May 2008	\$7.300 million	\$0 million	\$7.300 million	A	\$7.300 million
29	Thermal upgrade of Timaru – Temuka 110kV circuits 1&2	48/56MVA (Sum/Win)	69/76MVA (Sum/Win)	Apr 2005	\$0.500 million	\$0.073 million	\$0.427 million	A	\$0.427 million
30	Thermal upgrade of Invercargill– Roxburgh 220kV circuits 1&2	241/295MVA (Sum/Win)	347/382MVA (Sum/Win)	Apr 2005	\$3.800 million	\$3.719 million	\$0.081 million	A	\$0.081 million