

**BEFORE THE BOARD OF INQUIRY**

**IN THE MATTER** of the Resource Management Act 1991

**AND**

**IN THE MATTER** of applications for resource consent and notices of requirement by Transpower New Zealand Limited for the North Island Grid Upgrade Project

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**STATEMENT OF EVIDENCE OF ROBERT JOHN DELLER IN REBUTTAL FOR  
TRANSPOWER NEW ZEALAND LIMITED  
(Substations)**

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## Introduction

1. **MY** name is Robert John Deller. I wish to present rebuttal evidence to the statement of evidence of Ms Jade Wikaira, on behalf of Manukau City Council (**MCC**) (**Submission number 0861**).
2. **AT** paragraph 43 of her revised statement of evidence, Ms Wikaira states that the new Pakuranga Substation will be of a greater scale and impact than the existing one. The following table summarises some key differences between the two.

	Existing 110 kV substation	New 220 kV AIS substation
Area of switchyard	8,200 square metres (m <sup>2</sup> )	16,000 square metres (m <sup>2</sup> )
Height of gantry structures within switchyard	15 metres	Approx. 18 metres with 6 metre long lightning rods on top, i.e. about 24 metres in total
Number of power transformers	2	3

3. **AT** paragraph 50 of her revised evidence, Ms Wikaira requests that a condition be imposed to require construction of a GIS Substation at Pakuranga rather than an AIS. One of the reasons for this position appears to relate to the possibility that the existing Pakuranga-Penrose 110kV line (**PAK-PEN line**) could be undergrounded from the Pakuranga Substation (paragraph 42 of Ms Wikaira's revised statement of evidence).
4. I discussed the PAK-PEN line in my first statement of evidence, as follows:
  - (a) At paragraph 33(j), I state that the upgrade work at the Pakuranga Substation would involve "*providing for future connection of the two 220 kV circuits (cable or overhead line) to Penrose Substation*".
  - (b) At paragraph 48, I state that "*The existing Pakuranga-Penrose 110 kV transmission line would be decommissioned. However, a decision regarding retention or disposal of this line, including tower PAK-PEN 2, is yet to be made.*"
5. **IT** is correct that the existing 110 kV transmission circuits from Pakuranga to Penrose will be upgraded from 110 kV to 220kV as part of the North Auckland and

Northland project (**NAaN**) (which is described in Mr Boyle's first statement of evidence). However, it is not a foregone conclusion that the entire route of the PAK-PEN line will be underground cable. This is because approximately 1.3 kilometres of the existing overhead line from Pakuranga Substation is already constructed for 220 kV operation, and this line section may be used as part of the new 220 kV circuits. In other words, undergrounding could start around 1.3 kilometres from the Pakuranga Substation.

6. **IN** the event that the new 220 kV transmission circuits that are being installed from Pakuranga to Penrose, as part of the NAaN project, are underground cables for their entire length, then the existing transmission lines from Pakuranga to Penrose may be removed.
7. I also note that the reference at paragraph 48 of my first statement of evidence to "decommissioning" is not the same as "demolition" or "removal". Decommissioning refers to the asset no longer being available for operation as part of the power system either temporarily or permanently. However, a decommissioned asset may not be removed.
8. **ALTHOUGH** a GIS substation is more compact than an AIS substation, a GIS substation would still require substation gantry structures to support the last spans of the overhead transmission circuits before the circuits enter a GIS building. Two gantry structures will be required for the Otahuhu-Pakuranga 220 kV circuits as they will be overhead lines.
9. **HOWEVER**, in the case of the Pakuranga-Penrose 220 kV circuits, gantry structures will only be required if the circuits are retained as overhead lines, and will not be required if the circuits are undergrounded. These gantries would be similar in height to the AIS gantries as shown in the table set out above (18 m plus 6 m long lightning rods).
10. **THE** three power transformers would also be installed outdoors in concrete-walled enclosures, irrespective of whether the substation is AIS or GIS. Existing transmission line tower 15 would be retained for the Otahuhu-Pakuranga circuits. Tower 2 for the PAK-PEN circuits would also be retained if the existing 1.3 km long section from Pakuranga Substation to tower 6 is to be operated at 220 kV.

11. I also note that a recent January 2008 review of the costs showed that a GIS substation would be about \$17 million more costly than an AIS one, including the difference in cost of civil works. This figure is \$2 million more than set out at paragraph 35 of my first statement of evidence.

**Robert John Deller**

**28 March 2008**