

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

**STATEMENT OF EVIDENCE OF PETER GRAHAM SACREE
ON BEHALF OF VECTOR LIMITED**

26 FEBRUARY 2008

INTRODUCTION

Qualifications and Role

1. My name is Peter Graham Sacree. I am employed as a Gas Project Manager for Vector Limited ("**Vector**"). I have been in this role since 1996. Immediately prior to that I was a transmission pipeline engineer for British Gas Limited, responsible for construction and operations in the Eastern Region.
2. I hold the following qualifications and membership of the following professional organisations:
 - (a) New Zealand Engineering Certificate;
 - (b) Higher National Certificate in construction from Luton Technical College in England; and
 - (c) Membership of the Institution of Gas Engineers of New Zealand (IGENZ).
3. In my current role as Project Manager, I am responsible for all distribution gas pipeline day to day operations for Vector.
4. I confirm that I have read the Code of Conduct for Expert Witnesses in the Environment Court Consolidated Practice Note (2006). I have approached the preparation of this evidence in the same way that I would for the Environment Court. Accordingly, my evidence in this statement is within my area of expertise.

Scope of Evidence

5. In this brief of evidence, I discuss:
 - (a) Vector's gas distribution business; and
 - (b) the effect of Transpower's high voltage transmission cables on Vector's gas distribution operations.

Gas Distribution

6. Vector Gas Limited (part of the Vector Group) takes its gas supply from the transmission system (previously owned by NGC) at 28 gate stations spread throughout the Northland, Auckland, Waikato, Gisborne, Bay of Plenty and Wellington regions. The transmission systems operate at pressures ranging between approximately 50 and 80 bar and the gate stations typically deliver gas to Vector's distribution systems.
7. Vector's gas distribution system is comprised of intermediate pressure (IP), medium pressure (MP), and low pressure (LP) systems. Approximately 266 district pressure reducing stations (DPRS) are used to reduce the operating pressure from higher operating pressure systems to systems with lower operating pressures. Vector has currently a total of 49 separate gas distribution systems spread throughout the North Island of New Zealand.
8. Distribution systems usually extend from the outlet valve of the transmission delivery point to the inlet valve on a consumer gas measurement system (GMS).

Impact of Transpower's High Voltage Transmission Cables on Vector's Gas Distribution Operations

9. As part of Transpower's North Island Grid Upgrade Project, underground transmission cables into Auckland are required from:
 - (a) the proposed Brownhill Substation to the existing Pakuranga Grid Exit Point ("**GXP**"); and
 - (b) the proposed Brownhill Substation to the existing Otahuhu GXP.

It is these parts of Transpower's application that Vector is concerned with.

10. The proposed underground transmission cable route (Transpower's designated corridor) will be located in legal road for much of its length through Manukau City. Vector is concerned that its existing network utility services, including gas distribution pipelines, are already located within these roads, and that in the future further crossings, and new

infrastructure running parallel to the proposed transmission cables, may be required.

11. Vector has the following gas distribution infrastructure already in place along and across parts of the proposed transmission cable route, and may require further infrastructure in the future, including:
 - (a) plastic gas distribution pipelines (up to 4 bar); and
 - (b) steel gas distribution pipelines (from 4 bar to 19 bar).
12. Vector is concerned with the thermal effect on the plastic gas pipelines currently in place and any future installation being in close proximity with the Transpower's high voltage transmission cables. Under normal circumstances ground temperature doesn't change much, however it is unknown what the risk of the higher temperatures from high voltage transmission cables will be on Vector's plastic gas distribution pipelines. The plastic gas distribution pipelines may become unstable with increased temperature.
13. As at the date of writing this evidence, we have asked Transpower what the thermal temperature increase may be, and have been provided with no information. Once the temperature range is known, Vector would need to assess the effect of this increase in temperature on the plastic pipelines. Until temperatures are known, appropriate mitigation measures can not be assessed.
14. In terms of the Vector's steel gas distribution pipelines, the effects of high voltage transmission cables are known to cause interference to the cathodic protection systems that protect these steel pipelines from corrosion. All of Vector's steel networks are protected by cathodic protection systems, either by impressed current or sacrificial anodes. The cathodic protection systems cover the entire network. Transpower were requested to provide information regarding the effects of their proposed Upgrade Project to Vector, and as at the date of writing this evidence we have received no firm indications as to the effects.

15. There are ways to mitigate and uprate cathodic protection systems, but this would be at a considerable cost to Vector. The major issue is one of induced A/C and the safety issues associated with this. Operationally this leads to fluctuating potential readings of the cathodic protection system which compromise the ability to operate the network safely as corrosion cannot be accurately monitored. Mitigation measures would involve large scale earthing along the affected length of the pipeline.

Relief Sought

16. I have had the opportunity to read Timothy Chatterton's evidence and agree with the recommendations. I suggest the same should be applied for Vector's current and future gas distribution assets that may run in parallel to or cross Transpower's designated corridor.



Peter Graham Sacree

26 February 2008