

Reply to: Auckland Office  
Our ref: 0901  
Email: jeffrey.wilson@wilsoncook.co.nz

29 October, 2009

Mr Mike Buckley  
General Manager,  
Network Regulation North Branch  
The Australian Energy Regulator  
Marcus Clarke Street  
CANBERRA ACT 2601

Dear Mr Buckley,

***RE: REVIEW OF EXPENDITURE OF ACT & NSW GAS DNSPs: ACTEWAGL DISTRIBUTION'S NETWORK***

In response to your instructions, we have reviewed certain matters in the gas access arrangement proposal submitted by ActewAGL Distribution (ActewAGL) to the Australian Energy Regulator (AER) in July 2009 in relation to capital and operating expenditure on its network in the last year of the present access arrangement period, FY 2010, and in the next period, FY 2011 to FY 2015, and have pleasure in submitting our report. <sup>1</sup>

## **1 Scope of Review**

The particular scope of the review in relation to ActewAGL was as follows.

- (a) Review the capital expenditure forecast for FY 2010, the last year of the present period, noting that it is higher than the level approved by the ICRC <sup>2</sup> and taking into account the deferral or change in scope of certain projects and the addition of new projects providing pigging facilities.
- (b) Review the capital expenditure forecast for capacity development in FY 2012, as it appears high due to the deferral of the Tuggeranong primary mains extension and Queanbeyan primary regulator station projects from the present period.
- (c) Review the capital expenditure forecast for the proposed Hoskinstown-Fyshwick loop against the requirements of the *National Gas Rules* (the Rules), including consideration of:  
(a) whether security of supply is a problem that would justify the capital expenditure; and (b) if so, whether the project proposed by ActewAGL is the best and cost-efficient option.

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<sup>1</sup> Throughout the report, references to the AER are generally to the management unless the sense requires reference to the Board itself; references to periods are to regulatory (access arrangement) periods unless the context requires otherwise; references to ActewAGL or to 'the business' are to ActewAGL Distribution; and references to 'the network' are to ActewAGL's network.

<sup>2</sup> Independent Competition and Regulatory Commission, the previous jurisdictional regulator.

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- (d) Review the forecast ‘stay-in-business’ capital expenditure in the next period, excluding expenditure on the Hoskinstown-Fyshwick loop, against the requirements of the Rules, noting that it appears to be significantly higher than that approved and forecast for the present period.<sup>3</sup>
- (e) Review the proposed controllable operating expenditure,<sup>4</sup> including projects or programmes undertaken by Jemena Asset Management (JAM) on behalf of ActewAGL. In particular, consider whether: (a) the proposed programmes or projects are required; (b) whether the extent or scope of each programme or project is appropriate; (c) whether the unit rates and costs applied are appropriate and reasonable; (d) whether due consideration has been given to potential efficiency improvements; and (e) whether there is any overlap or double-counting of the operating expenditure programmes and the proposed capital expenditure programme. In relation to item (e), our attention was drawn to the step changes proposed under the headings technical regulation and project-specific costs in the Access Arrangement Information, section 9.2.1.2, pp. 165-9.
- (f) Review the proposed level of unaccounted-for gas (UAG) in the network for reasonableness.<sup>5</sup>

This scope of work was to be undertaken, as far as applicable, within the context of the original, general terms of reference for the review, which included the following requirements.

### *Capital Expenditure*

Capital expenditure in the present period was to be assessed under rule 79 of the Rules and where appropriate the criteria in sections 8.16 and 8.17 of the *Gas Code*<sup>6</sup> and capital expenditure in the next period was to be assessed in accordance with rule 79 of the Rules.<sup>7</sup>

We were to consider whether the past capital expenditure and capital expenditure forecasts for the business were reasonable and represent the best forecasts, given the operating context of the business and having regard to the capital expenditure criteria in the Rules.

In that context, in relation to capital expenditure, we were to assess past capital expenditure in relation to accepted good industry practice to achieve the lowest sustainable cost of providing the services and in relation to the relevant conditions in which the business operates; and we were to assess forecast capital expenditure in relation to the capital expenditure that would be incurred by a prudent service provider acting efficiently in accordance with accepted good industry practice to achieve the lowest sustainable cost of providing services and in relation to the arguments advanced by the business in support of it.

We were to distinguish between capital expenditure for replacement on the one hand and capital expenditure for augmentation on the other. In distinguishing the drivers of capital expenditure, we were to have regard to the appropriateness of the capital expenditure for augmentation in

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<sup>3</sup> ‘Stay-in-business’ capital expenditure is defined by the business as expenditure that relates to the renewal and replacement of ageing network assets, condition of the assets, compliance requirements relating to safety, reliability and asset protection. (Source: AAI, p. 95.)

<sup>4</sup> Excludes consideration of Uniform Network Facilities Tax expenditure, debt raising costs, self-insurance costs and other non-controllable costs.

<sup>5</sup> The report was to include a discussion of the factors that affect UAG and account for its level in different networks but a detailed discussion of this matter was provided by the business in its proposal.

<sup>6</sup> ‘*National third party access code for natural gas pipeline systems*’, including amending agreements.

<sup>7</sup> A précis of the requirements of the Rules in relation to capital expenditure was set out in the background information provided to us by the AER. Both the *Gas Code* and the Rules consider the compliance of expenditure in terms of whether it is needed for maintenance of the safety, integrity or capacity of the services or words to that effect. However, they also list other grounds on which expenditure could be considered compliant – e.g. in relation to revenue exceeding cost or suchlike.

terms of forecast demand and the appropriateness of capital expenditure for replacement in terms of the general condition and age of the network.

In summary, we were to advise on the value and/or nature of capital expenditure that should be included or should not be included in the present and next periods.

#### *Operating Expenditure*

We were to assess the business's proposals in relation to forecast operating expenditure with reference to operating expenditure that would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.

In circumstances where past operating expenditure had been used as a base to establish forecast operating expenditure, we were to assess the reasonableness of past operating expenditure and the escalation factors applied with reference to operating expenditure that would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.

In summary, we were to advise on the value and/or nature of operating expenditure that should be included or should not be included in the present and next periods.

#### *Definitions*

We were to outline the definitions of 'prudence', 'efficiency' and 'lowest sustainable cost' assumed in our analysis.

#### *Expenditure Proposals Considered Unsuitable*

If we considered that the proposed expenditure did not meet the relevant criteria of the *Gas Code* or the Rules, whichever is applicable, we were to provide an alternative estimate for the expenditure or propose an alternative option for it that would ensure the continued quality, safety, reliability and security of supply.

#### *Other Matters*

We were to liaise with the business during the course of our review including, if necessary, requesting through the AER any additional information and documentation needed and meeting with the business as required.

We were to present our draft report to the AER by 28 August 2009 and we consulted the AER before the work began to clarify what was practical to achieve in the limited time available for the review. The scope of this report reflects the conclusions so reached and outlined at the beginning of this section of the report.

## **2 Relevant Material and Consultation**

For the purpose of the review, we received and considered the business's proposals and its supporting documents, particularly the Access Arrangement Information (AAI), including supporting appendices and documents such as internal policies and procedures, technical reports and data and the report of the relevant jurisdictional regulator for the present period. We sought and received clarifications and additional information from the business in written responses and at our meeting with its staff in Canberra on 13 August 2009.

We acknowledge with thanks the cooperation of the business's staff in this regard.

## **3 Matters Not Reported On**

The review was limited to the context of our instructions – specifically, the particular scope of work set out at the commencement of section 1 above.

The following matters were excluded from consideration in our work or were not undertaken:

- review of forecast demand, as that was not within our terms of reference;
- review of the business's policies for the capitalisation of expenditure;
- review or re-calculation of detailed network analyses;
- review of the cost-of-materials or cost-of-labour escalators applied by the business;
- review of expenditure other than that associated with the business's network business unit;
- review of capital contributions;<sup>8</sup>
- physical inspection of the assets;
- re-calculation of expenditure if we had reason to consider the projections inappropriate, other than in respect of proposing adjustments for the AER's consideration;
- consideration of the possible effects of the following factors that can only be conjectured:
  - requirements for capex related to future safety issues, new statutory requirements, new Government policies or initiatives, or environmental requirements except to the extent that they have been identified by the business;
  - possible adjustments in capex stemming from the application of demand management policies other than those already reflected in the business's estimates;
  - any changes from current network planning or design practice;
- any matters outside our field of expertise; and
- any other matters identified elsewhere in the report as having been excluded from our work.

We did not attempt to verify the accuracy of the data provided to us, or of the statements and representations made by the business. Nor did we carry out an audit of the business's accounts, asset register, data, expenditure, processes or any item or activity or take any action that might be considered to have constituted an audit. We relied instead solely on the submissions received from the business and the representations made in response to our enquiries.

#### **4 Independence and Probity**

Wilson Cook & Co Limited and its reviewers are all independent of ActewAGL and the AER, other than in the context of providing the AER with professional advice on expenditure matters from time to time.

Whilst the AER's staff provided guidance in respect of our terms of reference and assisted us with our work and whilst we considered their advice and requests, we are satisfied that none influenced our report or its conclusions inappropriately.

#### **5 Definitions**

##### *Prudence and Efficiency*

The terms of reference do not define prudence or efficiency for the purpose of the review. Therefore, without attempting to interpret the Rules (and except in the case of our assessment of prudence of the business's capex in the current period – see below), we adopted the following approach.

We first noted that the objective of the review was in essence to assess the business's expenditure proposals and to report to the AER on whether in our opinion the forecast expenditure reasonably

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<sup>8</sup> Our assessments relate to net capital expenditure, not gross.

reflected the efficient costs of a prudent distribution network service provider (DNSP) working in the circumstances of the business concerned.

We noted that to ensure adequacy or effectiveness, a prudent operator might undertake more work than otherwise considered necessary but to ensure efficiency it might undertake less and thus a balance between the two is required.

We noted that *prudence* has connotations of exercising sound judgement especially concerning one's own interests, being careful to avoid undesired consequences, being cautious or circumspect in one's conduct, managing carefully and with economy. Prudence is often best judged by the absence of evidence suggesting a lack of it. In the case of gas networks, imprudence might be most discernible if there was evidence of failure to invest adequately, accompanied by identified adverse consequences, and is thus best assessed retrospectively.

Where we considered that there was an appropriate balance between these factors, prudence and efficiency, we have said in the text that we consider the expenditure "reasonable".

Where we identified instances of imprudent expenditure, an imprudent failure to make expenditure or of what appeared to be inadequate provision for future expenditure, we have described them.

We considered *efficiency* in terms of the nature or timing of expenditure and looked for evidence that as far as practicable the expenditure reflected optimal planning and design and competitive costs taking account of local factors, 'good gas industry practice' and the defined security of supply and service standards of the business concerned.

#### *Good Gas Industry Practice*

We interpreted *good gas industry practice* to be the exercise of that degree of skill, diligence, prudence and foresight reasonably to be expected of a distribution business working under the prevailing conditions consistent with applicable regulatory, service, safety and environmental objectives.

## **6 Capital Expenditure in FY 2010**

In relation to capital expenditure in the present period, we were asked to review the expenditure forecast for FY 2010, the sixth and final year of the period, noting that it is higher than the level approved by the ICRC. Our terms of reference asked us to take account of the deferral or change in scope of certain projects and the addition of new projects providing pigging facilities.

#### *Proposed Expenditure*

ActewAGL forecasts a capital expenditure in FY 2010 of \$14.71 m on system assets and \$0.92 m on non-system assets compared with \$8.10 m and zero respectively in the ICRC's final decision of 2004, an overrun of \$7.53 m. The overrun is made up of a \$1.2 m overrun on capital expenditure for market expansion, a \$2.6 m overrun in capital expenditure for capacity development, a \$2.8 m overrun in stay-in-business capital expenditure and a \$0.92 m overrun in non-system capital expenditure.

#### *Assessment*

In total, over the full period, capital expenditure is projected to be \$0.7 m lower than that approved by the ICRC with a \$0.1 m overrun in expenditure for market expansion, a \$2.2 m under-run in expenditure for capacity development, a \$0.6 m under-run in stay-in-business expenditure and a \$2.0 m overrun in non-system capital expenditure.

Market expansion expenditure under-ran only in the first two years of the period and over-ran or is predicted to over-run in the rest; that capacity development expenditure under-ran in years 2, 4 and 5 and over-ran in the rest; that stay-in-business expenditure under-ran in all years except the last; and that non-system expenditure matched its allowance in the first year, was insignificant in years 2 to 4 and is comprised principally of regulatory costs in years 5 and 6.

The overrun in expenditure in the period as a whole is analysed in table 6.2 on p. 97 of the AAI. The table shows that the business deferred capital expenditure until the end of the period (and, in some cases, beyond it), noting (on p. 96 of the AAI) that it was able to do so through “prudent deferrals of meter replacement and capacity development projects due to lower demand”.<sup>9</sup>

Setting aside market development expenditure (which is considered to have responded to market needs and shows only a 0.2% variance over the period as a whole) and non-system expenditure (which appears to have followed the planned pattern in the first year and a logical pattern in the final two years and was not fully budgeted for originally), the questions we considered were:

- (a) whether the variances in the remaining system expenditure categories were explainable and reasonable; and
- (b) since deferral had been found possible, whether it was for a sufficiently long period.

#### *Capacity Development Expenditure*

Capacity development expenditure was 14% below the approved level in the period. The main variations arose through timing and scope changes, the addition of the Hoskinstown water bath heat upgrading project at a cost of \$1.64 m and the deferral of the Queanbeyan PRS and secondary main project and the Tuggeranong mains extension project to the next period in response to lower demand growth.

#### *Stay-in-Business Expenditure*

Stay-in-business expenditure was 6% below the approved level in the period, due mainly to the adoption of a longer life for residential meters and a consequential deferral of meter renewals and upgrades. The deferral was based on test results.<sup>10</sup>

#### *Observations*

We reviewed each of the main components of these programmes with the business and were satisfied as to the appropriateness of the changes made in the scope and timing of the work and in the expenditure programme over the period.

We noted that it is normal for individual works to be deferred or advanced in response to changing circumstances as part of normal network development practice and so deferrals *per se* need not be a matter of concern unless the deferrals have the effect of disguising excessive costs for a reduced scope of work actually undertaken. Such a situation usually manifests itself in noticeably higher rates or in increasing rates for work of a standard type although it may also reflect itself in higher-than-needed reported costs for completed major projects. However, the reported expenditure over the period does not disclose such tendencies – at least, not as far as we can see from the information provided by the business or from our enquiries. (We did not ask for a comparison of the quantities assumed when the expenditure for the present period was approved with those installed during the period, as a detailed comparison of that type did not appear warranted.)

We did not attempt to verify the unit costs of the work undertaken, as we understand that it (the work) was contracted to JAM at agreed rates.

We did, however, consider whether the deferral of expenditure to the final year of the period was appropriate (as opposed to some or all of it being deferred further) but we noted that some of the expenditure had been deferred further, into the next period. Having reviewed the nature of the

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<sup>9</sup> The AAI also notes that the ICRC’s accepted level of capex was less than that proposed at the time by the business, principally because: (a) the ICRC considered that growth would not occur to the extent envisaged by the business and so cut the capital expenditure budget for growth by 1.5%; and (b) the ICRC estimated a lower unit cost for meter replacements and so cut the stay-in-business budget by 20%. The AAI includes a reference to other adjustments made by the ICRC to the business’s projections as well (AAI, p. 98).

<sup>10</sup> Further details are given in the AAI on pp. 100-106.

work deferred, we were satisfied that the deferrals were appropriate and that the work within the period had not been undertaken prematurely.

### *Conclusion*

In conclusion, we consider that the capital expenditure forecast for FY 2010 in the present period is reasonable with the exclusion of the capitalised amount reported for regulatory costs in that year, as we did not assess that non-technical item.

## **7 Capacity Development Expenditure in FY 2012**

In relation to capital expenditure in the next period, we were asked to review the capital expenditure forecast for capacity development in FY 2012, as it appears high due to the deferral of the Tuggeranong primary mains extension and Queanbeyan primary regulator station projects from the present period.<sup>11</sup>

### *Proposed Expenditure*

ActewAGL proposes capacity development expenditure of \$21.57 m in the next period compared with \$13.72 m in the present period. The annual expenditure under this heading in the next period is forecast to be \$4.81 m in FY 2011 and \$13.64 m in FY 2012, with the balance of \$3.12 m spread over the three final years.

We confirmed from the AAI, table 6.14, that the Tuggeranong primary mains extension project is expected to fall mainly in FY 2012 along with the Tuggeranong primary regulator station project but that the Queanbeyan primary regulator station project is expected to fall in FY 2011. The Queanbeyan project was therefore not considered further.

The Tuggeranong projects account for approximately \$13.3 m of the \$13.64 m of forecast expenditure in FY 2012, the year under consideration.

### *Assessment*

The Tuggeranong projects are explained in the AAI on p. 115. In essence, the secondary network in the Tuggeranong area is approaching its design minimum pressure and work is required to expand the network capacity to meet projected load growth. The scope of this work was initially determined through network modelling and followed up by network capacity validation processes to confirm the optimal timing. The proposed new Tuggeranong PRS will consist of a duty and standby train to maintain supply in the event of a failure of either of them or of the Phillip PRS. A 5.7 km primary main extension is required to supply the new PRS and the design will allow for in-line inspection by pigging. We reviewed the engineering assessment of the project that accompanied ActewAGL's proposal and discussed the project during our meeting with the business. We considered that the work was a conventional solution to the increasing demand foreseen in the area.

We noted that the scope of work is still subject to detailed design and that, in accordance with the capital expenditure control and review processes that the business follows before proceeding with the implementation of its capital works, the cost estimate is still subject to a wide tolerance. However, based on the information available, we considered the estimate reasonable.

### *Conclusion*

In conclusion, we consider that the capital expenditure forecast for FY 2012 in the next period is reasonable.

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<sup>11</sup> We were asked to review the capital expenditure in this year as a whole under this item for the reason given (the deferrals mentioned). However, since the high level of capital expenditure in this year is due mainly to the proposed Hoskinstown-Fyshwick loop project and since that project and stay-in-business expenditure generally is the subject of remaining items in the stated scope of the review, we restricted our assessment under the present heading to capacity development expenditure which, anyway, addresses the question of the work at Tuggeranong.

## 8 Hoskinstown-Fyshwick Loop

In relation to capital expenditure forecast for the proposed Hoskinstown-Fyshwick loop,<sup>12</sup> we were asked to consider (a) whether security of supply is a problem that would justify the capital expenditure on this project; and (b) if so, whether the project proposed by ActewAGL is the best option and cost-efficient.

### *Background*

ActewAGL states (AAI, p. 119) that “in each of the previous three years (2006, 2007 and 2008), the ActewAGL gas network has experienced significant threats to security of supply. These have been variously due to operational difficulties experienced at the Moomba gas field and with the main transmission pipelines supplying the network, coupled with peak winter demand in the ACT region”. It goes on to state that such an event, occurring in 2006, required voluntary reductions in consumption by ActewAGL’s customers. It states that a similar event, in 2007, was discussed by the AER in its State of the Market report and it cites a passage from that report.

ActewAGL accepts that incidents such as these are not directly attributable to the management, operation or capacity of the business’s network but states “they pose significant risk to security of gas supply in the ACT. Moreover, the nature of the ACT market is such that there are no large industrial customers from which load can be shed in such circumstances”.

ActewAGL considers that as winter peak demand increases further over time, “the potential for interruptions to gas supply [to] the network is likely to increase”.

It states, “Given the supply reliability concerns in relation to the integrity of gas supply services, ActewAGL Distribution has been actively considering alternative options to ensure that supply to the ACT can be maintained during upstream supply events and higher than anticipated local demand. Following the most recent events in 2008, the ACT Chief Minister wrote to ActewAGL requesting that it examine as a matter of high priority what is in its power to do, to provide greater security of gas supply to the ACT and the region”.

The AAI then proceeds to discuss the features of the ACT market, its winter peak load, the threat to residential load of a lack of security of supply, the recent incidents cited above, options for improving the security of gas supply and the selected option.

### *Options Considered by the Business*

ActewAGL states (AAI, p. 122) “The four options considered are summarised below:

- 1 *Primary Loop.* Primary loop on ActewAGL’s network from Belconnen, across the Molonglo Valley to Phillip. Approximately 20 km.
- 2 *Dalton-to-Watson Loop.* This option would entail the installation of a compressor by [the owner of the] MSP<sup>13</sup> to enable greater supply capacity from the MSP, plus looping of the MSP between Dalton and Watson, in order to provide additional storage capacity.
- 3 *Hoskinstown-Fyshwick loop.* Looping of ActewAGL’s network between Hoskinstown and Fyshwick, by installing a 42 inch (1050 mm) gas pipeline from the Hoskinstown Station to the NSW border, paralleling the existing 10-inch Hoskinstown to Fyshwick interconnection.
- 4 *Hoskinstown-Fyshwick Loop and Primary Loop.* A combination of options 1 and 3 above.

“These four options were presented to the ActewAGL Joint Venture Board in October 2007 and option 4 was identified as the most appropriate on the basis of the likely cost per TJ of capacity gained and that it is an option within ActewAGL’s control. The [Hoskinstown-Fyshwick loop]

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<sup>12</sup> A loop is a pipe in parallel with another.

<sup>13</sup> Moomba-Sydney Pipeline.



(HFL) is the first stage of this development. The Dalton-to-Watson loop (option 2) would be likely to cost a similar amount to the HFL but would provide less storage capacity, since the MSP is operated at a lower pressure than ActewAGL's network at Hoskinstown. This option would also require investment by the APA Group (owner of the MSP) and is therefore not within the control of ActewAGL Distribution.

"A subsequent in-depth technical analysis of the HFL was undertaken in order to confirm capacity requirements. The details of the planned HFL development are set out in the following section.

"A further alternative to the looping options presented above which has been considered is the parking of gas by ActewAGL Distribution, as a contingency measure. Under this scenario, ActewAGL Distribution would enter into a contract with either the EGP<sup>14</sup> or MSP for additional 'own-use' gas which it would then park in the pipeline to have available to supply the ACT. In practice, capacity on the EGP is currently fully contracted, which means that ActewAGL would most probably need to obtain gas from the MSP. Given that the delivery point for the MSP at Walton is already at capacity, this option would [require] the installation of a compressor on the MSP at Dalton. This investment is outside ActewAGL Distribution's control. This option would also put ActewAGL in a potential trading role, outside of the scope of ActewAGL Distribution's current activities. For these reasons, the option of ActewAGL parking gas to ensure security of supply is not considered to be viable.

"The primary function of the proposed HFL is to provide contingency supply to the ACT in the event of a supply imbalance or shortage upstream of the network. Specifically, the HFL project will increase the length of time that the ACT network can withstand an upstream disruption to supply during the winter peak from 1 hour to 16 hours. As a result, the HFL will increase the flexibility of the network in accommodating fluctuations in demand and unexpected upstream disruptions.

"ActewAGL Distribution considers that the capital expenditure associated with the HFL project is conforming capital expenditure, in line with NGR 79(1). As it is necessary to maintain the integrity of services, the capital expenditure is justifiable in line with Rule 79(2)(c)(ii).

"JAM has undertaken a feasibility study on the HFL at the request of ActewAGL Distribution. The feasibility study identified two options, which were then further investigated:

- (a) 21 km of 42-inch pipe from Hoskinstown Station to within a kilometre of the NSW/ACT border near Queanbeyan. Option A [would provide] 88 TJ storage at an estimated cost of \$130 m; that is, a price/TJ of \$1,477,273.
- (b) 16.5 km of 42-inch pipe from Hoskinstown Station, stopping on the east of the first Captains Flat road crossing. Option B [would provide] 66 TJ storage at an estimated cost of \$95 m; that is, a price/TJ of \$1,439,394.

"Given that the cost per TJ of the two options is very similar, ActewAGL has decided to undertake Option A, on the basis of the greater degree of security that this option will provide. The \$130m cost of Option A has therefore been incorporated into ActewAGL Distribution's capital expenditure forecasts for the forthcoming access arrangement period.

"The next steps in relation to this project will be the detailed design process plus the procurement process for the long lead items (principally the 42 inch valves, pipe and induction bends).

"ActewAGL notes that the HFL is Stage 1 of the option for improving security of supply. Stage 2 consists of looping the Canberra primary main. It is envisaged that Stage 2 will be developed in conjunction with expansion of suburban development through the Molonglo Valley, over the next five to ten years. No expenditure associated with Stage 2 has been incorporated in the expenditure projections for the access arrangement period. Documents relating to the development of the HFL can be found at attachment H [to the AAI]."

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<sup>14</sup> Eastern Gas Pipeline.

## *Summary of Proposed Expenditure*

ActewAGL proposes to spend an estimated \$134.28 m in the next period, mainly in FYs 2012 and 2013, to construct a loop between Hoskinstown and Fyshwick with the principal objective of providing gas storage to protect the network and its customers against gas supply interruptions arising due to a shortage of available gas or transmission pipeline interruptions.

## *Supporting Documentation*

Various technical papers are submitted with the business's proposal in support of the project and the expenditure. Amongst other things, the papers disclose that the cost estimates are presently considered to be of an accuracy of plus or minus 30%, as is common with specialised engineering works of this type, pending the completion of detailed designs and confirmation of tender prices.

## *Observations*

Before considering the relevant general principles, we would like to make the following technical observations.

- (a) Both the favoured options, (a) and (b), provide a considerable amount of storage in relation to the current maximum daily quantity demanded of around 70 TJ/day.<sup>15</sup> However, this and the evaluation criterion used – cost per TJ of storage – beg the question: what contingency ought to be provided against.
- (b) If the loss of gas supply from both transmission pipelines – in other words, a total loss of supply – is considered the appropriate criterion, then the storage envisaged in the selected option might be appropriate, assuming a duration of one day or so for the event, although such a contingency would have ramifications well beyond the confines of the ACT.
- (c) If, on the other hand, the loss of supply from a single transmission pipeline (or an equivalent level of disruption) were considered the appropriate criterion, then the storage required would be considerably less.<sup>16</sup> Simplistically, it would be reduced to the maximum daily demand less line pack available less a small amount for load shedding less the supply available from the remaining transmission pipeline. Since the supply through Watson is understood to be more limited than supply through Fyshwick, the former would appear to be the ruling case. Taking that case, and again assuming a duration of one day or so for the event for illustrative purposes, the storage requirement with no supply available from the EGP could be an order of magnitude less than the level provided by the business's chosen option – say, for the purpose of illustration, 5 to 15 TJ.<sup>17 18</sup> If this criterion were considered

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<sup>15</sup> Data provided to us indicates that the maximum daily quantities (MDQs) demanded in 2005, 2006 and 2007 were 58 TJ, 70 TJ and 67 TJ (on two consecutive days) respectively. An appropriate MDQ for project evaluation purposes would be in that range, with increases for the growth in demand over time.

<sup>16</sup> We understand from ActewAGL that, in August 2008, gas supply from the MSP was disrupted owing to plant failures at Moomba and supply to the network was switched to the EGP. In addition, ActewAGL's responses to a question at the public forum held on 27 July 2009 referred to another incident in 2007 and that incident was described in the presentation given to us at our meeting.

<sup>17</sup> Whilst the AAI does not specifically address the risk of one supply being disrupted, we understand that the EGP supply from Hoskinstown has a capacity of 77 TJ/day and thus can meet the current maximum daily demand of 70 TJ/day by itself, whereas the MSP supply via the Dalton-Watson pipeline is limited in capacity to 56 TJ/day and cannot. The AAI does not appear to provide any information on why the capacity of the Dalton-Watson supply is limited to 56 TJ/day although it does say the option of installing a compressor station and adding a loop to that pipeline to provide storage was considered. The presentation made to us at our meeting indicates that the 56 TJ/day limit arises from the maximum allowable operating pressure on the MSP and the size of the Dalton-Watson pipeline.

<sup>18</sup> The AAI refers to a present winter demand of around 70 TJ/day, a current network storage capacity of approximately 8 TJ of gas (which we understand from the business is equivalent to about an hour's supply in the winter peak) and around 2 TJ/day of controllable (contract) load on the network. Summer demand is much lower.

the most relevant, then options to remove the capacity constraint on the Dalton-Watson pipeline would need to be considered, along with options that provide a lower level of storage matched to the criterion.<sup>19</sup>

- (d) The duration of the contingency event, as well as allowances for future load growth, would need to be taken into account in either case when determining the storage requirement.<sup>20</sup>
- (e) Steps have already been taken to increase the throughput at Hoskinstown (the water bath heater associated with the metering train has been upgraded) and other measures are proposed (upgrading at Fyshwick) to allow a further increase in throughput or to provide against contingencies (problems at Hoskinstown).
- (f) The documents provided to us did not appear to contain an economic evaluation of the benefit of risk reduction *vs.* cost. An economic evaluation (which would take into account the impacts of non-supply on consumers and the economy) is, however, the normal method of evaluating infrastructure investments of this type – notwithstanding that the cost to the business of a failure would be limited to the financial cost plus the cost of damage to its reputation.<sup>21</sup>
- (g) Storage to address a shortage of bulk gas supply need not necessarily be within ActewAGL’s distribution network although the business has taken the view that the storage ought to be within its control.<sup>22</sup>

### *Summary of Considerations*

#### *The Business’ Case for Action*

In summary, as we understand the case made by the business, the principal reasons cited for proposing action to mitigate the risk of gas supply interruption or shortage are, in our words, as follows.

- (a) The network experienced gas supply constraints in 2006 that reduced gas pressure to critical levels.
- (b) Incidents in subsequent years have further raised the business’s concern.<sup>23</sup>
- (c) The network supplies a predominantly domestic load with, as a consequence, a minimal level of interruptible load that can be used to reduce demand should a supply constraint occur.
- (d) The cost of shutting down parts or all of the network are said to be high, as the procedure involves visiting every customer’s installation to shut off the gas, then a further visit to resume supply safely after the bulk gas supply and network pressures have been restored.<sup>24</sup>
- (e) In addition, if built, the project would enable the supply of gas to large new loads.<sup>25</sup>

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<sup>19</sup> ActewAGL’s responses to a question at the public forum held on 27 July 2009 state “In reality, it could be expected that at least one supply point would be fully operational...”

<sup>20</sup> When dealing with extreme events of the type cited, an assumption that the event will be of short duration (e.g., one day or so) may be a fallacy. It may be that such types of event, by their nature, are of longer duration.

<sup>21</sup> In commenting on our draft report in relation to matters of confidentiality, ActewAGL referred to information on the value of security of supply to customers, derived from a “willingness-to-pay” survey but that differs from the comparison of economic costs and benefits to which we refer.

<sup>22</sup> Gas “parking” in the EGP was one of the options considered by the business but was rejected because the capacity in that pipeline was said to be fully contracted and for other reasons given in the AAI.

<sup>23</sup> See footnote 16.

<sup>24</sup> These costs should be quantified as part of the economic analysis of the project.

<sup>25</sup> None is scheduled to materialise in the next period, including the gas-fired power station load referred to in the documents, and no other expenditure is forecast in the next period in respect of such loads.

### *Other Considerations*

In terms of general principles, the following factors should also be considered.

- (a) The extent to which the business, as a distribution pipeline owner-operator, need or should make provision for a contingency of this type – interruption of bulk gas supply – at its own expense is unclear to us.
- (b) Calculation of the risk of a gas supply failure occurring would require a detailed review of all relevant factors including a study of the incidents reported to date, any other incidents that are known to have occurred, the corrective actions taken to date or proposed by the business or other parties, the projected demand for gas in relation to projected levels of supply and any other relevant matters. Such a study is beyond the scope of our review.
- (c) Any risk thought to arise through potential market failures would introduce a further level of complication although market failures, should they occur, should presumably be addressed by the Government or its regulatory agencies.<sup>26</sup>
- (d) Any risk arising from the miscalculation or under-nomination of demand by retailers or other parties should presumably be mitigated by better forecasting methods or other safeguards.
- (e) Failure of the gas supply to the ACT network would entail risk to the reputation of all the parties involved, including the retailer.
- (f) If it is accepted that the business ought to provide against loss-of-bulk-gas-supply contingencies of the type discussed, then the “worst credible contingency” should be determined – in essence, either the loss of supply from one of the transmission pipelines or both – as should the duration of the event that is to be provided for and its probability of occurrence. Only after that is done can the least-cost solution be identified.

(A further consideration, which we note for completeness but in respect of which we do not offer an opinion, is whether expenditure to secure the supply of gas is “conforming expenditure” in the context of the safety, integrity or delivery capacity of the pipeline services under consideration.)

(Also for the sake of completeness, we note that we have not attempted to verify the correctness of any of the quantities or capacities mentioned in this part of the report but have relied on the information provided to us by the business.<sup>27</sup>)

### *Conclusion*

Returning to the questions asked of us, we conclude as follows.

- (a) The security of bulk gas supply to the network is demonstrably an issue that warrants further review;
- (b) Whether the situation justifies the proposed project is unclear, however, as: (i) there is no definitive statement, as far as we can determine, of the worst credible contingency (and its duration) that ought to be provided for; (ii) the risks are not quantified, nor is the degree to which they will be removed or mitigated by the proposed project; (iii) the evaluation criterion used by the business – cost per TJ of storage – is not appropriate, as the evaluation needs to be constrained by the storage requirement and should be carried out in economic terms, taking into account the cost of non-supply and other relevant factors; (iv) there are other considerations to be taken into account as set out above under the heading of that name; and (v) the cost estimate for the project is subject to a tolerance of +/-30%, to be confirmed on detailed design and possibly the receipt of tendered prices for certain items.

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<sup>26</sup> The business considers that the risk is increased by the forthcoming introduction of a Sydney gas hub short-term trading market (STTM), due to the anticipated reduced notification time in respect of gas shortfalls.

<sup>27</sup> However, our argument does not rely on the assumption of any particular quantity or capacity.

- (c) We consider, therefore, that the project justification given to date falls short of a properly developed business case.

In summary, we consider that insufficient justification has been given for this expenditure.

## **9 Balance of Stay-in-Business Capital Expenditure in Next Period**

We were asked to review the forecast ‘stay-in-business’ capital expenditure in the next period, excluding expenditure on the Hoskinstown-Fyshwick loop, against the requirements of the Rules, noting that it appears to be significantly higher than that approved and forecast for the present period.

### *Proposed Expenditure*

The business proposes \$156.6 m of stay-in-business capital expenditure in the next period, of which \$10.32 m is projected to fall in FY 2012, \$52.47 m in FY 2013, \$86.99 m in FY 2014, \$3.79 m in FY 2014 and the remaining \$3.03 m in FY 2015. Excluding the Hoskinstown-Fyshwick loop project discussed above, the total proposed capital expenditure under this category is \$22.32 m over the period. A breakdown of this expenditure is given in the AAI in table 6.15 on p. 118 and the expenditure is discussed in the text that follows that table.

A significant part of the expenditure (after deducting the Hoskinstown-Fyshwick loop project) is accounted for by a small number of projects to be undertaken at the beginning of the next period. These include upgrading of the Fyshwick station to two trains to provide greater security of supply (\$4.2 m), the installation of scraper stations on the Canberra primary main for pipeline condition monitoring (\$1.7 m), the installation of pigging facilities on the Hoskinstown-Fyshwick trunk main, (\$1.3 m) and a multi-utility metering initiative, Project MIMI (\$1.4 m). Meter replacements account for \$10.97 m and the remaining \$2.65 m is accounted for by routine mains and services work.

### *Assessment*

The principal reason for the work at Fyshwick TRS is to provide redundancy to cope with contingencies by installing a second meter and pressure reducing train. Whilst a quantitative risk assessment analysis has not been presented in support of the expenditure, we consider that the proposed changes are in keeping with the importance of this station and that the scope of work is reasonable. We noted that the cost estimate for the work is still expressed with a wide tolerance and is subject to confirmation on detailed design but we are satisfied that the estimate is reasonable for planning purposes. The project is scheduled for the first year of the period. There is no reason why it should be scheduled for any particular year in preference to another except that the sooner it is completed, the sooner the risk is mitigated.

The installation of scraper stations is part of a policy by the business to improve the surveillance of its pipelines. Comprehensive supporting material was presented in support of this approach. We reviewed the material and considered it reasonable.

Project MIMI is a multi utility – viz. electricity, water and gas – metering service that has been considered by the AER in relation to ActewAGL’s electricity network expenditure and has already been reviewed by us in that context.<sup>28</sup> We consider the expenditure reasonable.

The meter replacement programme is based a projection of the number of units reaching their maximum life. Implicitly, this expenditure is needed to maintain the integrity of this asset class in accordance with the requirements of the *Gas supply (gas meters) regulation, 2002*.

The smaller projects appear to have an appropriate design basis.

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<sup>28</sup> We were informed during the electricity review that the total cost of MIMI was \$7m of which the ICRC had approved an allocation of 40% to electricity, 40% to water and 20% to gas. The proposed expenditure of \$1.4m is consistent with this allocation.

We discussed these items with ActewAGL's staff, accepting the reasons for the major items and noting the routine nature of the remaining work. We considered that the documentation provided by the business was sufficiently comprehensive in relation to this expenditure and we considered that the expenditure proposed was reasonable.

We were further satisfied that the management team was knowledgeable about the network, that it had comprehensive asset management plans in place and that it had a full understanding of the network requirements, at least as far as we were able to tell.

### *Other Considerations*

#### *Capital Expenditure Governance Processes*

Section 3.5.2 of the AAI describes the capital expenditure governance and approval processes followed by the business and the processes involved were explained to us at our meeting. We noted in particular the levels of accuracy applicable to cost estimates at the various stages and the approval processes, considering them satisfactory for a business of this type.

#### *Asset Management Contracting and Governance*

We noted that ActewAGL contracts out the management of its gas distribution network to JAM under a distribution asset management services agreement known as 'DAMS'. The agreement, which is a key part of the business's asset management and risk strategy, is described in section 3.1.1 of the AAI. The arrangements include provision for market testing (see p. 27 of the AAI).

#### *Basis of Cost Estimates*

Section 6.2.1.1 of the AAI states that forecasts of capital expenditure for the network during the next period have been derived using a zero-base approach using DAMS Agreement unit rates for FY 2010, engineering estimates and engineering assessments of specific major capital projects. The base estimates for the engineering assessments are stated to be in FY 2009 dollars and have been escalated to FY 2010 dollars.<sup>29</sup> All other capital expenditure is stated to have been estimated based on the DAMS Agreement unit rates or engineering estimates for smaller projects in 2009/10 dollars.

The AAI states that unit rates under the DAMS Agreement have been commercially negotiated and that Parsons Brinckerhoff (PB) was engaged to provide an independent assessment of the rates used in the proposed expenditure programme (see Attachment I to the AAI). We have reviewed the PB report and note that it found the proposed unit rates acceptable. We reviewed PB's methodology and findings and considered them reliable.

Other than in these respects, we noted that the project cost estimates provided by the business are generally expressed with a wide tolerance of accuracy, are presented as lump sums without detail on how the figures are arrived at and are subject to confirmation on detailed design. It was generally not possible, therefore, to comment on the estimates except to say that they appear reasonable for planning purposes.

### *Conclusion*

Given these considerations, and notwithstanding the preceding point, we concluded that the forecast 'stay-in-business' capital expenditure in the next period, excluding expenditure on the Hoskinstown-Fyshwick loop, is reasonable.

## **10 Controllable Operating Expenditure in Next Period**

We were asked to review the proposed controllable operating expenditure,<sup>30</sup> including projects or programmes undertaken by JAM on behalf of ActewAGL. In particular, we were asked to consider whether: (a) the proposed programmes or projects are required; (b) whether the extent or

<sup>29</sup> We did not review the cost escalation method or calculations.

<sup>30</sup> Excludes Uniform Network Facilities Tax expenditure, debt raising costs, self-insurance costs and other non-controllable costs.

scope of the programme or project is appropriate; (c) whether the unit rates and costs applied are appropriate and reasonable; (d) whether due consideration has been given to potential efficiency improvements; and (e) whether there is any overlap or double-counting of the operating expenditure programmes and the proposed capital expenditure programme. In relation to item (e), our attention was drawn to the step changes proposed under the headings technical regulation and project-specific costs in the AAI, section 9.2.1.2, pp. 165-9.

Before considering these items, however, we would like to note several matters that have influenced the work we have been able to carry out in this section of our review.

### *Considerations Relevant to Scope of our Review*

#### *Structure of ActewAGL's Operating and Maintenance Costs*

A substantial proportion of the business's operating and maintenance costs are the fees and charges paid to JAM under its contract with ActewAGL to provide field and asset management services related to the operation of the network. The fees and charges include the costs of labour, materials and an allocation of Jemena's corporate overheads. The non-system asset charge is paid to JAM and is a charge to compensate it for the return of and on capital on non-system assets required in the management of the network. These costs are not covered by the fixed fees (management service fee and asset services fee) which relate only to JAM's operating costs in providing its services to ActewAGL. ActewAGL also pays a fee to JAM for network development and incurs costs associated with corporate overheads, its own marketing and other direct costs (for example, insurance) as set out in table 9.1 of the AAI.

#### *Lack of Detailed Information*

Very few details of these costs are provided in the AAI and very little detail has been provided on individual operating and maintenance programmes, either, or on the projects undertaken by JAM, except in relation to the step changes.<sup>31</sup>

#### *Basis of Operating Expenditure Estimate in Next Period*

In the present period, JAM appears to have managed the operating and maintenance services for the sum that was provided for in the last determination. It also appears that the basis of estimation of operating expenditure in the next period is the escalation of the sum in the present period, plus the identified step changes.

A benchmarking study completed by JAM has been relied upon to illustrate that the cost of the services is efficient.

To enable the questions asked of us to be addressed, the business would need to be asked to provide detailed analyses of JAM's costs to deliver the services.<sup>32</sup>

Given that the management costs of the various entities involved are likely to be highly integrated, we considered it might be very difficult to break them down in a way that would support an assessment of efficiency of service delivery without a detailed "bottom-up" analysis of the costs being available.

#### *Summary of Our Approach*

We raised these points with the AER and in consultation with the AER, it was decided that we would examine the following matters under this part of the review:

- (a) whether the normalisation adjustments made in the benchmarking analysis were reasonable and appropriate; and

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<sup>31</sup> For example, the Services Plan in Appendix Q of the AAI lists the services that JAM provides but the allocation of the fee to the services is only at a very high level.

<sup>32</sup> The method of allocation of corporate overheads in each cost category has been provided (in Appendix Q to the AAI) but there is no breakdown of the costs in these categories. That would also be required for the analysis requested.

- (b) whether the proposed step changes related to technical matters were justifiable as additions to the level of operating expenditure derived from the escalation of the level in the present period.

### **10.1 Normalisation Adjustments Made in Benchmarking Analysis**

The benchmarking analysis tabled by the business presents results essentially in terms of ActewAGL's position in relation to certain of its peers in the Australian gas distribution industry in terms of the following performance indicators: opex as a proportion of the length of mains; opex as a proportion of customer numbers; and opex as a proportion of the regulatory asset base.

The calculations have been normalised for network design differences – specifically, whether the mains are run down both sides of streets (“dual mains”) or only on one side – and customer density. Once normalised, the results showed that ActewAGL is in line with its peers and that in all the performance indicators, it was below the mean and within the 95% confidence interval of the analysis.

At our request, the business elaborated at our meeting on these normalisation adjustments and demonstrated that the normalisations had not had the effect of changing the findings of the analysis.<sup>33</sup>

#### *Factors Not Considered in the Analysis*

We asked whether the normalisation process had taken into consideration and adjusted for the difference in costs for leasing compared with owning assets such as corporate head office premises. We were informed that whether network businesses lease or own their property had not been considered because publicly available information did not include such a level of disaggregation and it was likely that some businesses would lease and some would own.

It appeared to us that the benchmarking related to a period prior to or substantially prior to the time at which ActewAGL commenced leasing its corporate headquarters.<sup>34</sup> If that is correct, then ActewAGL's costs in the benchmarking will be lower than those it is now experiencing.

Whilst the differences in total opex between leased property and owned property were considered not be material, we did note that without an adjustment for leasing *vs.* ownership, ActewAGL's position in the performance indicators might have been favoured.<sup>35</sup>

We also noted that the benchmarking did not take account of differing network ages and considered, given that ActewAGL has a relatively young network, that this could have favoured the business in the comparisons. However, we also noted the views expressed in the benchmarking report that age is considered “a tertiary cost driver because the dispersion of the average age of networks in Australia would not be expected to be significant”; that “unless a network is particularly new, this is unlikely to have a significant impact as renewal and

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<sup>33</sup> ActewAGL says it is unique in the group in having a “dual mains” approach. Normalisation for that has therefore had the effect of reducing the denominator (length of mains) in this performance measure and presenting the business in a poorer light (although still at a value less than the mean) in terms of the opex-per-kilometre measure. The normalisation adjustment in respect of the opex-per-customer measure has had the reverse effect, favouring the business. Prior to normalisation – that is, based on the raw data – ActewAGL showed as having a level of cost on an opex-per-customer basis just below the mean: after normalisation, it showed as being the lowest in the group on this measure.

<sup>34</sup> The period or year to which the benchmarking relates is not clear to us from the benchmarking report itself but we infer from the introduction in the report (para 2 on p. 4) that the period is “the current AA period (1 January 2005 – 30 June 2010)”. By comparison, we note from para 3 on p. xvi of the *Access Arrangement Information* that higher operating costs “beginning 2008” arose from, amongst other things, the decision to lease rather than own ActewAGL's corporate headquarters.

<sup>35</sup> We also noted that a change from owning office buildings to leasing them normally requires a reduction in the regulatory asset base to be made on disposal of the buildings with an accompanying adjustment in capital servicing costs. However, we have not investigated that matter in this instance.



replacement of assets has the effect of keeping the average age of assets fairly consistent once a network reaches maturity”; and that “This is also one respect in which gas and electricity networks differ in that the impact of age on mains and facilities is not as significant for gas”.

As a general principle, we considered that benchmarking is likely to be less robust if disparate entities are compared or if “related party” transactions are involved as, in the latter case, the comparisons may be made with entities whose efficiency is not so readily demonstrated.

We also considered, as a general principle, that benchmarking is best presented as an accompaniment to other substantiating analyses such as a “bottom-up” analysis of operating costs.

### *Conclusion*

Overall, we accepted that the operating expenditure benchmarking analysis presented by ActewAGL suggests, *prima facie*, that the business operates with a cost structure within the levels of confidence in the benchmarking. However, the lack of a “bottom-up” analysis of operating costs related directly to the cost-efficiency of the services offered and supporting this finding ought to be noted.

## **10.2 Reasonableness of Step Changes Related to Technical Matters**

The step changes proposed in section 9.2.1.2 of the AAI and listed in appendix N to the AAI were discussed with ActewAGL’s management during our meeting and they were subsequently asked to provide brief explanations of the basis of calculation of the costs, the dates that any new obligations came into effect and confirmation of the nature of the activity involved. The responses are summarised below.

### *Step Changes Arising for Technical Regulation or Compliance Reasons*

Three step changes were proposed, arising from matters to do with technical regulation in the sense of compliance with Australian Standards. They covered such matters as staff training the need for which appeared to be well established (*viz.* a regulatory requirement) and the approach sound. The calculation of amount of opex is based on the cost of workshops including preparation time at an average cost per person-day of \$1,152. The time allowances appeared reasonable but the rate is considered high if it relates mainly to field staff or technical staff on lower salary levels.

Another question that arose was whether these activities replaced existing activities but we did not find evidence of that.

### *Step Changes Related to Project-Specific Costs*

The business confirmed that the Jerrabomberra packaged off-take station (POTS) would no longer be required once the new Queanbeyan TRS is built. Annual operating costs of \$9,840 (2009/10 dollars) were erroneously included and should be removed from the proposed expenditure from FY 2012 onwards.

The business confirmed that the step change in respect of the Philip PRS upgrade should commence in FY 2015, not in FY 2012.

The two large step changes relating to the integrity of mains were discussed with the business. Subsequently, the business was asked to confirm the required frequency of integrity inspections and operating pressure verification and to provide an outline of the mandatory requirements relating to these matters. It was asked to provide a brief history and description of any changes to these requirements. If such mandatory requirements were in effect in the present regulatory period, it was asked to indicate how they were met and what costs, if any, will cease because of the change in technique to pigging on the pipelines concerned. A brief description of the method of calculation of the costs claimed was requested. In response, we were advised as follows.

- pipeline inspections are required at not less than five-yearly intervals.

- compelling reasons exist why intelligent pigging is preferred to other inspection methods and cited it as the least-cost method in terms of net present value.
- intelligent pigging was not considered necessary in the present period.
- Appendix H.1 of the AAI gave the breakdown of costs; it shows that the estimates are made up of costs for a pigging contractor, materials, consultants and Jemena's fee.

We have no reservations about the use of pigging, given its superior features. We also consider that the five-year inspection interval is reasonable in the circumstances (as opposed to a more frequent interval). We note that the nature of the work proposed in these step changes differs materially from the inspection work undertaken in the present period because of its different and more comprehensive nature and the addition of the step changes to the previous level of operating expenditure therefore appears reasonable in principle. We are unable to comment in detail on the budgeted costs as few details are provided, other than to observe that: (i) a material part of the costs are contracted to a specialised party, the pigging contractor; (ii) the Jemena fee is also a material component (but we were not able to review its make-up); (iii) the costs are preliminary estimates subject to a wide tolerance of accuracy; and (iv) the cost components for "validation digs including repairs" are not contingencies but are required to calibrate the "pigging" information.

On balance, we considered that the two large step changes relating to the integrity of mains are reasonable.

The other project-specific step changes are minor, were discussed with the business and considered reasonable.

#### *Remaining Step Changes*

The remaining step changes were not technical (engineering) in nature, so we do not offer an opinion on them.

#### *Conclusion*

In conclusion, we consider that the step changes proposed in the categories 'technical regulation' and 'project-specific costs' should be accepted subject to the two adjustments mentioned above in relation to the project-specific costs, viz. in respect of the Queanbeyan TRS (since the Jerrabomberra POTS will not then be required) and the Phillips TRS, in respect of which the introduction of the step change should be deferred to FY 2015. The need for both adjustments has been confirmed by the business.

## **11 Level of Unaccounted-for Gas**

### *Factors Affecting Unaccounted-for Gas*

The terms of reference asked us to include in the report a discussion of the factors that affect UAG and account for its level in different networks. However, these factors have been set out comprehensively in section 9.2.3.3 of ActewAGL's proposal and are not repeated here other than to note: (a) that ActewAGL's network is relatively modern and does not include cast iron pipes or old steel pipes, both of which are prone to leakage; (b) it can thus be expected to exhibit a low level of UAG; and (c) the efficient level of UAG for a particular gas network will depend on the features of the network concerned and ought to be determined in relation to its own condition and circumstances.

### *Level of UAG on the Network*

Regarding the most appropriate level of UAG to assume for the network, the business has reported a rise in UAG from a mean of around 0.7% around 2004 to a level over the period September 2007 to June 2008 of around 1.7%, rising to 1.8% in two months. The business has examined the reasons for this movement and has reported them in section 9.2.3.3 of its AAI and in subsequent responses to our questions. We, also, have attempted to reconcile the figures but

the matter is indeterminate, as the effects of some of the factors cannot be quantified. This was not of concern as, in the absence of evidence of unsatisfactory stewardship of the assets, the best guidance available as to the level of UAG to accept in the next period is the actual level reported by the business at present.<sup>36</sup>

On that basis, we consider that the AER should adopt a level of UAG of 1.7%. (We acknowledge that this is slightly lower than the level of 1.8% proposed by the business but we note that, generally, the business's references to its figure are couched in terms of "up to" 1.8% and we thus consider that figure a maximum rather than an average.)

### *Price of Gas*

We did not assess the efficiency of the price of gas assumed when costing UAG, as that was outside our brief.

## **12 Opinion**

Having considered the information received from the business and the factors required to be considered as summarised in this report, and based on that information, the representations made to us by the business and our own experience, our opinion in respect of ActewAGL's expenditure proposals in relation to its network is as stated below.

- (a) The capital expenditure forecast by ActewAGL for FY 2010 is considered prudent and efficient.
- (b) The capital expenditure forecast by ActewAGL for capacity development in FY 2012 is prudent and efficient.
- (c) Insufficient justification has been presented to support the proposed Hoskinstown-Fyshwick loop project.
- (d) The remainder of the 'stay-in-business' capital expenditure forecast by ActewAGL for the next period is considered prudent and efficient.
- (e) It was not possible to review ActewAGL's proposed controllable operating expenditure in the way envisaged by the AER because of insufficient information. However, we concluded: (i) that the operating expenditure benchmarking analysis presented by ActewAGL suggests, *prima facie*, that the business operates with a cost structure within the levels of confidence in the benchmarking but the lack of a "bottom-up" analysis of operating costs related directly to the cost-efficiency of the services offered and supporting this finding ought to be noted; and (ii) that the step changes proposed for technical regulation or compliance reasons and for project-related reasons are reasonable, subject to two minor adjustments discussed in section 10.2 of this report.
- (f) A reasonable level of unaccounted-for gas to allow in the determination would be 1.7% of gas receipts.

### *Qualifications of the Reviewers*

Our opinion has been formulated for and on behalf of Wilson Cook & Co Limited by Mr Jeffrey Wilson with the support of Mr Peter Cole, Mr Derek Walker and Mr Pat Hyland, with internal review by Mr Bernard Ivory. Mr Wilson is a professionally qualified engineer, experienced in undertaking reviews this type. Messrs Cole, Walker and Hyland are also professionally qualified engineers and Mr Ivory is a chartered accountant and economist. All team members have considerable experience in the energy sector and in assessments of this type. Curricula Vitae of the team members are attached.

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<sup>36</sup> Notwithstanding the increase, the figure is still low, as is expected of a modern network.

### **13 Conditions Accompanying Our Opinion**

#### *Assessment Not an Assessment of Condition, Safety or Risk*

Notwithstanding any other statements in this review, this review is not intended to be and does not purport to be an assessment of the condition, safety or risk of or associated with the business's assets and nothing in this report shall be taken to convey any such undertaking on our part to any party whatsoever.

#### *All Earlier Advice Superseded*

For the avoidance of doubt, we confirm that this report supersedes all previous advice from us on this matter, whether written or oral, and constitutes our sole statement on the matter.

#### *Disclosure*

Wilson Cook & Co Limited has prepared this report in accordance with the instructions of its client on the basis that all data and information that may affect its conclusions have been made available to it. No responsibility is accepted if full disclosure has not been made. No responsibility is accepted for any consequential error or defect in our conclusions resulting from any error, omission or inaccuracy in the data or information supplied directly or indirectly.

#### *Disclaimer*

This report has been prepared solely for our client, the Australian Energy Regulator (AER), for the stated purpose. Wilson Cook & Co Limited, its officers, agents, subcontractors and their staff owe no duty of care and accept no liability to any other party, make no representation or warranty as to the accuracy or completeness of the information or opinions set out in the report to any person other than to its client including any errors or omissions howsoever caused, and do not accept any liability to any party if the report is used for other than its stated purpose.

#### *Non-Publication*

With the exception of its publication by the AER, in relation to its review of the business's expenditure proposals, neither the whole nor any part of this report may be included in any published document, circular or statement or published in any way without our prior written approval of the form and context in which it may appear.

Yours faithfully

**Wilson Cook & Co Limited**



Attachment: CVs



## CURRICULUM VITAE

**Jeffrey Wilson** **Engineering and Management Consultant, Adviser & Valuer**

<b>Born</b>	1947
<b>Nationality</b>	New Zealander
<b>Education</b>	ME, University of Auckland, 1970 BCom, University of Auckland, 1979  Courses and conferences locally and internationally on technical, managerial, leadership, governance and financial reporting matters, including IoD courses.
<b>Languages</b>	English : mother tongue Portuguese: reasonable reading ability, limited conversational ability French: reasonable reading ability, limited conversational ability
<b>Professional Affiliations</b>	FIET (UK), CEng (UK), FIPENZ, CPEng (NZ), MIEEE (USA) International Professional Engineer (IntPE) and APEC Engineer Member, New Zealand Association of Economists Member, Institute of Directors NZ
<b>Countries of Work Experience</b>	New Zealand, Australia. Europe: Portugal and Russia. SE Asia, the Pacific and Africa: Bangladesh, Bhutan, Cambodia, PR China, East Timor, Federated States of Micronesia, Fiji, India, Indonesia, Kyrgyz Republic, Laos, Malaysia, the Maldives, Mongolia, Nepal, Pakistan, Papua New Guinea, the Philippines, Samoa, Sri Lanka, Tanzania, Thailand and Vietnam.
<b>Key Qualifications</b>	Qualified in commerce and engineering.  Corporate governance experience, including chairmanship, since 1988, in electricity utilities, state-owned entities (Industrial Research Ltd), private companies, trust-owned companies and other bodies (listed on next page).  38 years of professional experience in engineering and management consulting, advisory work and valuations including corporate development and management training in utility businesses, power system planning, economic and financial evaluation of projects, economic and financial modelling and evaluations, asset and business valuations and management of major multi-disciplinary projects.  Adviser in New Zealand to electricity and gas utilities on valuation and regulatory matters.  Adviser in Australia to regulatory bodies in New South Wales, the ACT, Victoria, Tasmania, Western Australia and federally (the Australian Energy Regulator) in relation to expenditure projections and fixed asset valuations for price determinations. (Wilson Cook & Co is currently working in NSW, the ACT and WA.)  Adviser to the Independent Pricing and Regulatory Tribunal of NSW on various special assignments including prudential matters and economic and financial modelling of isolated combined heat and power schemes.  Power sector project experience as Project Director, Team Leader, Power Engineer or Economist on power planning and corporate and sector restructuring projects in S.E. and South Asia, Portugal, Tanzania and Russia from 1984 to 2003.  Experience in numerous due diligence investigations, project and business assessments,

risk assessments and valuations.

Expert witness in the High Court on various matters from c.1976 to the present time.

Consultant to the World Bank and Asian Development Bank on project formulation and sector policy development. Experience includes 2 years on the staff of the Asian Development Bank.

## Employment Record

From-To (Month/Year)	Employer/Position	Description of Duties
May 2003 – Present	Wilson Cook & Co Limited – Founder and Managing Director	Engineering and management consultants, advisers and valuers.
Sep 1983 – May 2003	Worley Consultants, Beca Worley International then Meritec Limited – Department Manager	Manager in charge of power planning and management consulting services, economic and financial evaluations and asset valuations, 1984-2003.
	Meritec Group Ltd – Director and Chairman	Member of Board of Directors of Meritec Group over various periods from 1987 to 2002. Chairman from 1998 – 2001.
	Companies in Public and Private Sector	Non-executive director. Various appointments in the energy and industrial sectors since 1990.
Sep 1981 – Sep 1983	Asian Development Bank – Project Engineer	Technical and economic evaluation of projects. Loan administration.
May 1974 – Sep 1981	Mandeno, Chitty & Bell – Senior Engineer/Economist then Partner	Management and direction of a wide range of design and construction projects from power generation to boiler plant and building services. Project evaluations.
May 1971 – May 1974	New Zealand Electricity Department – Assistant Electrical Engineer	Substation design and construction supervision. Power system operational studies.

## Company Directorships

Company directorships in public and state-owned companies in the energy and industrial sectors as follows:

Counties Power Ltd	July 2000 – Present
Industrial Research Ltd	July 1997 – June 2000
Materials Performance Technologies Ltd	c. July 1998 – June 2000 a/
Supalink Ltd	November 1997 – June 2000 a/
Mercury Energy Ltd	November 1993 – July 1994 b/
Geothermal Energy (NZ) Ltd	March 1990 – March 1991
Meritec Group Ltd	Chairman, March 1998 – February 2001 Director, December 1995 – August 2002, February 1994 – August 1994, and February 1988 – February 1991
Various private organisations, companies and trusts	President, director or trustee of various organisations and entities since around 1978.

a/ IRL representative.

b/ Resigned due to conflict with consulting practice.

## **Experience in the Gas Sector**

### **Valuation of Gas Distribution Network**

November 2008 – Present

### **Review for IPART of Prudential Requirements related to Isolated Electricity Supplies in NSW**

November 2007 – June 2008

### **Regulation and Valuation of Electricity and Gas Network Fixed Assets - Powerco**

September 2006 – Present

### **Regulation and Valuation of Electricity and Gas Network Fixed Assets –Vector**

April 2006 – Present

### **Audit of New Zealand’s Infrastructure (Electricity and Gas)**

September 2003 – December 2003

### **Valuation of Gas and Electricity Assets for Vector Ltd (for two years), United Networks Ltd, Orion Limited (for two years), Transpower Limited (for two years) and Unison Ltd**

January 2002 – May 2003

### **Due Diligence of Gas and Other Network Assets (Confidential)**

June 2002 – January 2003

### **Valuation of Gas Treatment Plants**

2002

### **Review of Field Maintenance Services for Gas Networks**

November 2001– January 2002

### **Sale and Purchase of Gas Network, New Zealand**

December 1999 – April 2000

### **Asset Management Plan for Gas Distributor and Preparation of Gas Network Valuation Handbook**

1994 – 2001

### **Confidential Valuation of High Pressure Gas Transmission Pipeline**

c. 1998

### **Valuation of High Pressure Gas Transmission Network**

1994

## **New Zealand and Australian Experience in the Regulatory Assessments etc**

### **Technical Consultant to the Economic Regulation Authority of Western Australia for Review of Expenditure Forecasts of Western Power’s proposed Second Access Arrangement**

October 2008 – Present

### **Principal Technical Consultant to the Australian Energy Regulator for Review of Expenditure Forecasts of the ACT and NSW Electricity Distributors**

November 2007 – Present

### **Adviser to Vector Limited on Expenditure-Related Matters**

June 2008 – December 2008

### **Due Diligence Review – Technical Adviser**

November 2007– April 2008

### **Review of Public Lighting Expenditures – Integral Energy**

August 2007 – February 2008

### **Review of Aurora’s Expenditures for Price Determination (Tasmania)**

December 2006 – June 2007

**Review of Audit Guidelines (NSW)**

March 2007 – April 2007

**Western Australia: Review of Western Power's Revised Expenditure Forecasts**

March 2006 – September 2006

**Consultant to IPART, NSW, for Cost Pass-Through Review**

January – April 2006

**Consultant to the Office of the Tasmanian Energy Regulator, for Mid-Term Review**

August 2005 – February 2006

**Consultant to the Economic Regulation Authority of Western Australia, for Review of Western Power's Asset Valuation and Expenditure Forecasts**

August 2005 – January 2006

**Principal Technical Consultant to Essential Services Commission, Victoria, for EDPR 2006**

October 2004 – October 2005

**Consultant to IPART, NSW, for Review of EnergyAustralia's Public Lighting Expenditures**

June 2005 – August 2005

**Review of Western Power's Estimates of Capex and Opex**

February 2004 – May 2004

**Review of DNSPs' Revised Estimates of Capex and Opex**

January 2004 – May 2004

**Submissions to Commerce Commission**

February 2004 – April 2004

**Appointment to Western Australian Electricity Sector Reform Panels**

October 2003

**Review of Electricity Distributors' Capital and Operating Expenditures for NSW Regulator**

December 2002 – September 2003

**Capital Expenditure Reviews for Regulatory Purposes**

May 1998 – November 1998

**Asset Management Plan and Long Term Network Development Plan Update for WEL Energy Group**

August 1996 – January 1998

**NSW State Government – Guidelines for Valuation of Network Fixed Assets**

May 1995 – January 1996

**New Zealand and Australian Energy Sector**

1991 – 2000

Consultant to over 30 power utilities and energy companies in Australasia

**New Zealand Power Sector**

October 1983 – December 1991

Consultant

**International Experience in the Electricity Sector**

Details of Mr Wilson's experience internationally are available on request.

**Other Experience**



**Details of Mr Wilson's other experience are available on request.**

## **Publications and Papers**

4. "Use of high-temperature water for the transport and distribution of heat", Trans. NZIE, 1981 (with B G Smith).
10. "Economic decision-making", Technical Forum, Auckland, April 1987 (with I.L. Wilson).
13. "Small isolated power systems - the issues", proceedings of Minerals and Energy Forum, Pacific Economic Co-operation Conference Specialist Group Meeting, August 1990.
14. "Capital investment appraisal in New Zealand's power sector in the 1990's", ESEA Generation Forum, Rotorua, March 1992.
15. "Valuation and regulation of New Zealand electricity companies: progress and issues", 10th CEPSI Conference, Christchurch, 1994.
16. "Developing transparent, efficient and effective procurement processes for power infrastructure in APEC member economies - a comparative study report", APEC Energy Working Group Report and Workshop, May 1997 (with W Jamieson of Norton Rose) (**ACENZ silver award-winning project**).
18. "Asset management strategies for power distribution utilities", Conference on Best Practice Asset Management for Utilities, Wellington, October 1997 (with R T Clifton and D S Todd).
21. "Long term network planning - best practice features", EEA Annual Conference, Auckland, June 1998 (with P C White and R T Clifton).
23. "Asset management plans and security of supply in the New Zealand electricity distribution industry", EEA Forum, Wellington, September 1998.
24. "Aspects of risk analysis and electricity network planning", Conference on Risk Management for Utilities, Auckland, December 1998 (with R T Clifton and G C Horvath).
25. "Outsourcing of engineering design and network maintenance services", AESIEAP CEO's Conference, Cebu, November 1999 (with R Clifton, M Tucker and L Lorentz).
26. "Review of international best practice in power system planning in the New Zealand context (with particular reference to the choice of voltage levels for sub-transmission and distribution and security of supply planning criteria)", EEA Conference, Auckland, June 2000 (with M.J. Whaley and H Tong).
27. "New Zealand electricity sector reform – a review of current issues", CEPSI 2000, Manila, October 2000 (with M.J. Whaley).
30. "New Zealand's experience of 'de-regulated' electricity supply", CIRED 18th International Conference on Electricity Distribution, Turin, 6-9 June 2005.
31. "New Zealand's power sector regulatory environment – an update", CIRED 19th International Conference on Electricity Distribution, Vienna, 21-24 May 2007.
32. "How useful is your asset management plan?", NZ 2<sup>nd</sup> Annual Electricity Network Asset Management Summit, Wellington, 20-21 November 2007.

## CURRICULUM VITAE

**Peter Cole**      **Fuels and Energy Specialist (Gas Distribution)**

<b>Born</b>	1942
<b>Nationality</b>	New Zealand
<b>Education</b>	BE (Mechanical Engineering, 1st Class Honours), University of Auckland, 1972 MPhil, Massey University, 2007
<b>Languages</b>	English :            mother tongue French:              reading ability
<b>Professional Affiliations</b>	MIPENZ Chartered Professional Engineer (New Zealand)
<b>Countries of Work Experience</b>	New Zealand, Australia, Bangladesh, Indonesia, Malaysia, Niue, the Philippines, Samoa, Singapore, Thailand, Vietnam and the Yemen.
<b>Key Qualifications</b>	Qualified in mechanical engineering with 37 years of professional experience in engineering consulting, advisory work and asset valuations.  Adviser to governments, institutional and private clients on fuel- and energy-related policies, plans and designs.  Adviser on energy supply options, fuel selection and utilisation.  Specialist in gas reticulation and use.  Experienced in natural gas and LPG market studies, planning, distribution and utilisation matters.  Experienced in CNG/NGV planning, technology and implementation.  Experienced in the design of mechanical and energy-related services for hospitals, institutional and commercial buildings.  Experienced in the co-generation of heat and power.  Experienced in the assessment of projects, including risk assessment.  Experienced in the management of energy sector projects in New Zealand and overseas.  Expert witness on energy- and gas-related matters.  Corporate governance experience.  Familiar with international lending agency and regulatory requirements.

## Employment Record

From-To (Month/Year)	Employer/Position	Description of Duties
Sept. 2001 - present	Empower Consultants Ltd – Energy Specialist/ Director	Specialist consultant for gas and energy sector projects in New Zealand and overseas.  Consultant to Wilson Cook & Co Limited.
April 1979 - September 2001	Meritec Ltd – Director	Management of gas sector projects in New Zealand and overseas including distribution and utilisation (industrial conversion and CNG).  Gas sector planning in New Zealand and overseas.  Preparation of reports and studies on natural gas, NGV/CNG and LPG markets, distribution and utilisation.  Planning and design of energy distribution and utilisation systems.  Expert witness on energy and related matters.
February 1972 - April 1979	Meritec Ltd – Engineer/Senior Engineer	Design of mechanical and energy services for hospital, institutional and commercial buildings.
April 1968 - February 1972	Meritec International Ltd - Senior Draughtsman	Design draughting work - mechanical services.
February 1967 - April 1968	A & T Burt Ltd - Estimator & Contract Supervisor	Estimating for and supervision of building services contracts.
June 1965 - February 1967	Ward Construction Ltd - Draughtsman	General mechanical and structural draughting.
August 1964 - April 1965	United Baltic Corporation Ltd – Marine Engineer	Watch-keeping and general engine maintenance.
November 1959 -	New Zealand Shipping Co. Ltd - Marine Engineering Apprentice	

## New Zealand and Australian Experience

### Gas Network Valuation for Vector Limited

November 2008 – Present

### IPART Review of Prudential Requirements related to Isolated Electricity Supplies in NSW

November 2007 – June 2008

### Gas Network Fixed Asset Valuation for Powerco Limited

October 2006 - continuing

### Gas Network Fixed Asset Valuation for Vector Limited

May 2006 – continuing

**Use of Landfill Gas as a Boiler Fuel at Nelson Hospital**  
2003- 2007

**Gas Supply Options Study for Powerco Limited**  
September 2005 to June 2006

**Gas Valuation Advice for NZ Commerce Commission**  
2003 - 2004

**Mid-Central Health Limited Gas Supply Contracts**  
1998- 2004

**Gas Network Fixed Asset Valuation for Vector Limited**  
January - August 2003

**Gas Network Due Diligence for Vector Limited**  
July- August 2002

**Gas network Valuation Handbook for Ministry of Economic Development**  
2001

**Gas Network Due Diligence for Siemens Limited**  
January - March 2001

**Gas Supply Contract for Water Care Services Limited**  
2000

**Cogeneration Studies for Various Clients**  
1990 to 2000

**Gas Network Due Diligence for Vector Limited**  
December 1999 - April 2000

**LPG Consultancy Services for Rockgas Limited**  
1978 to 1999

**Audit of LPG Installation**  
1999

**Comparative Fuel Study for Natural Gas Corporation**  
Completed 1998

**Gas Network Due Diligence for United Networks Limited**  
1998

**Expert Witness for Crown Law Office on Gas Pipelines**  
November 1996- July 1997

**Adviser to Department of Inland Revenue**  
May 1995 - May 1996

**Gas Pipeline Feasibility Study (Confidential)**  
1996

**Consulting Services to Capital Coast Health Ltd (Wellington) – Gas**  
1996

**Landfill Gas Utilisation Study for Waitakere City Council**  
1993

**Rockgas Limited**  
1986 – 1990

## **International Experience**

### **Natural Gas Codes in Bangladesh**

2005- 2006

### **Reduction of Vehicle Emissions in Jakarta**

2003- 2005

### **Gas Sector Policy and Regulatory Framework for the Philippines**

1998- 2002

### **Landfill Gas Utilisation in the Philippines**

1999- 2001

### **Natural Gas Utilisation Project**

1996 – 2000

### **Natural Gas as a New Energy Resource for the Philippines**

July 1997 – December 1999

### **New Zealand Ministry of Foreign Affairs & Trade – Natural Gas Utilisation in Transport**

1993 to 1999

### **LPG Substitution in Yemen**

1994 – 1998

### **Feasibility Study of Options for Transport of Natural Gas**

Completed 1986

### **Technical Audit of CNG Pilot Project**

Completed 1986

## **Selected Papers**

1. *“The New Zealand NGV programme and the lessons learnt”*, Technical Symposium and Investment Round Table on Transport Related Contracts for Natural Gas, ESCAP/Petronas, Kuala Lumpur, 1996.
2. *“Natural gas as an energy source for industrial and commercial buildings in ASEAN”*, ASEAN Energy Conference, Bangkok 1995.
3. *“The economics of compressed natural gas as a vehicle fuel- the New Zealand perspective”*, Petroleum Institute of Thailand conference: Gas Utilization Policies: an International Perspective, Pattaya, 1987.
4. *“Transport fuels in New Zealand – a new direction”*, World Energy Conference Regional Symposium, Perth, 1986 (with RK Green, JK Raine, NB Smith and P Waring).

## CURRICULUM VITAE

### **Derek Walker      Utility Management Adviser**

<b>Born</b>	1954
<b>Nationality</b>	New Zealander
<b>Education</b>	BE (Hons) (Electrical), University of Canterbury, 1975 BBS, Massey University, 1991 Various engineering and management training programmes, including Institute of Directors company director courses.
<b>Languages</b>	English :            mother tongue
<b>Professional Affiliations</b>	Member, Institution of Professional Engineers, New Zealand Member Institute of Directors in NZ
<b>Countries of Work Experience</b>	Australia, New Zealand.
<b>Key Qualifications</b>	<p>Qualified professionally in engineering and management.</p> <p>25 years' experience in management and senior engineering roles in the distribution sector of the electricity supply industry, leading to a thorough understanding of, and practical experience in, all aspects of the industry including generation, wholesale market, retail, distribution and utilisation.</p> <p>Development and utilisation of costing and pricing models for network and energy retail businesses.</p> <p>Knowledge and experience in planning, designing, maintaining and operating urban and rural electricity distribution networks.</p> <p>Considerable experience in negotiating and implementing major business transactions including mergers, acquisitions and sales.</p> <p>High-level understanding and practical application of all business management disciplines including strategic and business planning, performance management, finance, accounting, treasury, legal, risk management, engineering, marketing and human resources.</p> <p>Thorough knowledge and practical experience of governance responsibilities for both commercial and not-for-profit organisations.</p> <p>Ability to see the "big picture" and think laterally and strategically.</p> <p>Ability to develop and maintain a high performance management and organisation team culture in a changing environment.</p> <p>Empathy with staff and customers giving an ability to build strong loyalty.</p> <p>Excellent written and verbal communication skills and a high level of computer literacy.</p> <p>Familiar with the Australian and New Zealand electricity supply industry.</p> <p>Consultancy experience in multi-disciplinary teams since 2000.</p>

## Employment Record

From-To (Month/Year)	Employer/Position	Description of Duties
2001 – Present	Director and Principal, Third Bearing Ltd.	Business and management consulting and consultant to Wilson Cook & Co.
1989 – 2000	Chief Executive, CentralPower Limited (previously the Manawatu-Orua Electric-Power Board). Appointed Managing Director in November 1993.	Responsible for all aspects of the business's development and operation.
1981 – 1989	Ashburton Electric-Power Board. Substation and Distribution Engineer from 1981; Chief Engineer from 1986; and Commercial Manager from 1988.	Responsible, in final position, to the Chief Executive for all engineering, marketing and sales activities.
1979 – 1981	Electricity Division, Hamilton City Council. Design Engineer.	Responsible for electricity distribution network planning and design functions.
1975 – 1978	South Canterbury Electric-Power Board. Assistant Engineer.	Engineering planning, design, construction supervision and operational duties.

## Company Directorships

Directorships or trusteeships in private and public companies and trusts in the energy sector and in other organisations as follows:

Spiers Group Limited	2007 – Present
Quotable Value Limited	2005 – Present
NZ Windfarms Limited	Director, 2004 – 2005. Chairman, 2005 – Present
Central Energy Trust	2003 – Present
The Bio Commerce Centre Limited	Chairman, 2003 – Present
Third Bearing Limited and associated companies	2001 – Present
Palmerston North City Holdings	2000 – 2005
Palmerston North Airport Limited	Director, 2000 – 2002. Chairman, 2002 – Present
Manawatu Life Education Trust	Chairman, 1995 – 1997. Trustee, 1997 – Present.
Palmerston North Theatre Trust	Trustee, 1994 – 1998. Chairman, 1998 – 2006
Energy Brokers New Zealand Limited	Director, 1994 – 1996. Chairman, 1996 – 2000
Electricity Networks Association	1994 – 2000
CentralPower Limited and subsidiaries	1994 – 2000

## Relevant Experience

### Consultant to the Economic Regulation Authority of Western Australia for Review of Expenditure Forecasts of Western Power's proposed Second Access Arrangement

October 2008 – Present

### Consultant to the Australian Energy Regulator for Review of Expenditure Forecasts of the ACT and NSW Electricity Distributors

November 2007 – Present

### Review of Prudential Requirements related to Isolated Electricity Supplies in NSW

November 2007 – June 2008

**Brief Review of Projected Expenditures Arising from National Electricity Market (NEM) Responsibilities (Tasmania)**

June 2007 – July 2007

**Review of Aurora's Expenditures for Price Determination (Tasmania)**

December 2006 – June 2007

**Western Australia: Review of Western Power's Revised Expenditure Forecasts**

March 2006 – September 2006

**Review of Cost Pass-Through Expenditures of NSW DNSPs for IPART**

January – April 2006

**Consultant to the Office of the Tasmanian Energy Regulator, for Mid-Term Review**

August 2005 – February 2006

**Consultant to the Economic Regulation Authority of Western Australia, for Review of Western Power's Asset Valuation and Expenditure Forecasts**

August 2005 – January 2006

**Principal Technical Consultant to Essential Services Commission, Victoria, for EDPR 2006**

October 2004 – October 2005

**Business and Management Consulting**

Director and Principal, Third Bearing Limited

**Grid Security Committee (New Zealand)**

Committee Member

1999 – 2000

**Electricity Distribution Business Experience**

Various positions, including Chief Executive then Managing Director of CentralPower Ltd  
1975 – 2000





## CURRICULUM VITAE

**Patrick Hyland** **Asset Management Specialist**

**Born** 1957

**Nationality** New Zealand and Canadian

**Education** BE (Hons) (Electrical), University of Canterbury, 1979  
ME (Electrical), University of Canterbury, 1980

*Training Courses:*

“Construction contracts”, a course on contract law with an emphasis on NZS 3910.

“Project evaluation”, a course on the financial evaluation and risk assessment of projects by Arthur Young Associates.

“Management skills”, a two-week course with emphasis on management by objectives.

“ISRS orientation and management training”, a three-day course on the International Safety Rating System.

“Industrial relations”, a two-day course by consultant Mr P Meuli.

“Process Control”, a four-day course by Engineering Information Transfer.

“Interaction management”, a five-day trainer’s course in teaching the Interaction Management programme by Mentor Human Resource Group Ltd.

“Authorisation holder’s certificate (power plant)”, a course for authorisation to work on operational power plant.

First aid and CPR certification and subsequent revalidations.

“Power system dynamic simulation”, a six-day course by Dr J Undrill.

**Languages** English : mother tongue

**Professional Affiliations** Member, Electricity Engineers Association (New Zealand).

**Countries of Work Experience** New Zealand, Australia.

**Key Qualifications** Qualified in electrical engineering.  
27 years of professional experience in power engineering and in project management.  
Experience initially in generating plant and transmission networks, then in distribution networks.  
Experience in due diligence investigations, numerous project and business assessments, risk assessments and reviews.  
Experience in the preparation and review of asset management plans.  
Has specialised in the assessment of network service delivery and the prediction of asset lives.  
Has also specialised in analytical work and the assessment of risk.  
Adviser to several of New Zealand’s largest generation and network businesses.  
Adviser to network businesses in Australia.

Author of several published papers in these fields (listed at the end of this CV).

Winner of industry award for a project in automation and control (the Association of Consulting Engineers of New Zealand's Silver Award of Merit, 1992).

## Employment Record

From-To (Month/Year)	Employer/Position	Description of Duties
December 2005 to Present	Hyland McQueen Ltd – Principal.	Consultancy services to the power industry.  Consultant to Wilson Cook & Co Limited.
May 1995 to December 2005	Austral Engineering Associates Ltd – Principal.	Consultancy services to the power industry.
June 1992 to December 1994	Worley Consultants Ltd – Senior Engineer.	Responsible for project management and detailed design of projects for the power industry.
September 1987 to June 1992	Electricity Corporation of New Zealand – Group Electrical Engineer, South Island Hydro.	Responsible for various major projects and electrical standards at power stations in the South Island.
May 1986 to August 1987	New Zealand Electricity Department – Project Manager.	Responsible for the detailed design, procurement and construction of the \$10 million refurbishment of the Roxburgh 220 kV switchyard.
March 1981 to April 1986	New Zealand Electricity Department – Assistant Engineer.	Steam-field electrical design for Ohaaki geothermal power project; substation design standards, HVDC and filter bank controls and maintenance engineering.

## Experience in the Electricity Sector

### **Consultant to the Economic Regulation Authority of Western Australia for Review of Expenditure Forecasts of Western Power's proposed Second Access Arrangement**

October 2008 – Present

### **Consultant to the Australian Energy Regulator for Review of Expenditure Forecasts of the ACT and NSW Electricity Distributors**

November 2007 – Present

### **Due Diligence Assessment of the Orion Gas Network**

February 2000 to March 2000

### **Advice to Vector Limited on Expenditure-Related Matters**

June 2008 – December 2008

### **Review of Asset Management Planning Documents**

November 2007 to Present

### **Maintenance Optimisation Review**

August 2007 to November 2007

**Translating Generator Condition to Risk**

May 2007 to August 2007

**Insurance Risk Model Assumptions Measurement**

June 2007 to July 2007

**Tariff Meter Management Review**

January 2007 to March 2007

**Review of Asset Management Planning Documents**

November 2006 to January 2007

**Creation of Life-Cycle Models for Generation Plant**

February 2006 to August 2006

**Generation Embedding Risk**

May 2006 to July 2006

**Network Maintenance Contract Pricing for Lines Company**

January 2006 to March 2006

**Creation of Asset Management / Risk Management Software System**

August 2005 to September 2006

**Life Cycle and Risk Modelling Integration Project**

December 2004 to October 2006

**Impact Assessment of Energy-Efficient Lights on Networks**

August 2004 to September 2005

**Independent Review of Electricity Metering Plan – United Energy Distribution Ltd, Australia**

February 2005

**Engineering Overview for New Generation Proposal**

December 2004 to March 2005

**Hydro Generator Life Prediction**

August 2004 to November 2004

**Asset Management Assessment for Marsden B Power Station**

January 2004 to April 2004

**Cost and Risk Assessment for Due Diligence**

February 2004

**Asset Management Strategy Development**

January 2004 to March 2004

**Plant Risk Model Redevelopment**

October 2003 to May 2004

**Maintenance Contract Costing Model**

September 2003 to December 2003

**Line Charge Assessment**

July 2003

**Development and Drafting of Asset Management Plan**

March 2003 to May 2003

**Maintenance Processes Audit**

August 2002 to September 2002

**Network Reliability Modelling for Setting Network Maintenance Service and Capital Development Requirements**

November 2002 to December 2002

**Drafting 2003/04 Asset Management Plan**

August 2003 to September 2002

**Due Diligence Assessment of the Asset Planning of CitiPower Limited, Melbourne**

June 2002 to July 2002

**Develop Business Case for Rollout of Maximo CMMS**

August 2001 to January 2002

**Development of an Assets Inspection Data Collection Process**

May 2001 to September 2001

**Distribution Transformer Maximum Demand Approximation**

February 2001 to May 2001

**Capital Projects Database**

November 2000 to March 2001

**Development of “PlantRisk” Model for Asset Replacement Forecasting**

June 2000 to February 2001

**Drafting Asset Management Plan Describing Asset Replacement Requirements**

August 2000 to December 2000

**Sale of Contracting Division – Preparation of Maintenance Schedules**

May 2000 to August 2000

**Drafting an Asset Management Plan for Network Waitaki Ltd**

August 1999 to November 1999

**Maintenance and Replacement Documentation for United Energy Ltd – Melbourne**

September 1999 to November 1999

**Risk Statement for United Networks Ltd**

July 1999 to October 1999

**Reliability Forecasting Model for United Energy Ltd – Melbourne**

June 1999 to October 1999

**Weather Normalisation of Network Reliability Data for United Energy Ltd – Melbourne**

April 1999 to May 1999

**Asset Management Philosophy and Revision of the Asset Management Plan**

February 1999 to April 1999

**Compliance Testing Strategy for Domestic Metering for United Energy Limited – Melbourne**

August 1998 to April 1999

**Due Diligence Assessment of Electricity Network for United Networks Limited**

September 1998 to December 1998

**Overhead Line Reliability-Centred Maintenance Review for United Energy Limited – Melbourne**

February 1998 to September 1998

**Network Information System Review for Power New Zealand Limited**

July 1997 to December 1997

**Distribution Transformer Maintenance Strategy and Cost Model for Power New Zealand Limited**

April 1997 to July 1997

**Substation Database Design for Power New Zealand Limited**

January/February 1997

**Subdivision Design Review for Power New Zealand Ltd**

July 1996 to December 1996

**Maintenance Review for Power New Zealand Ltd**

May 1995 to July 1996

**Power Station Manuals Preparation**

May 1994 to November 1994

**Revenue Metering Project**

July 1992 to March 1994

**Revenue Metering Project**

September 1991 to July 1992

## **Publications and Papers**

1. Densem & Hyland, "Out of condition or condition drives assets", paper presented to EEA Conference, July 1996.
2. Densem, Hyland, Cochrane Whatley & Zonneveld, "Identify the maintenance risks or pay the cost", paper presented to Distribution 2000 Conference, Sydney, November 1997.
3. Hyland & Moffat, "Road-testing meter compliance", paper presented to EEA Conference, June 1999.
4. Hyland & McQueen, "What's that creeping up on you", paper presented to EEA Conference on distribution transformer management, June 2002.
5. McQueen M, Hyland & McQueen D, "An alternative to distribution transformer maximum demand recording", paper presented to Distribution 2003 Conference, Adelaide, November 2003.
6. McQueen, Hyland & Watson, "Monte Carlo simulation of residential electricity demand for forecasting maximum demand on distribution networks", IEEE Trans. PES, January 2004.
7. McQueen, Hyland & Watson, "Application of a Monte Carlo simulation method for predicting voltage regulation in low voltage networks", IEEE Power Engineering Society, July 2004.
8. Hyland, "Living with uncertainty: managing capital and maintenance expenditure for network reliability", 1<sup>st</sup> Annual Electricity Networks Asset Management Conference, Wellington, November 2006.
9. Hyland, "Asset replacement planning – one size does not fit all", 2<sup>nd</sup> Annual Electricity Networks Asset Management Conference, Wellington, November 2007.

## CURRICULUM VITAE

### **Bernard Ivory      Financial Analyst / Economist**

<b>Born</b>	1932
<b>Nationality</b>	New Zealander
<b>Education and Training</b>	<p>Bachelor of Commerce (Accountancy &amp; Economics) University of New Zealand 1955 Professional examinations of The Institute of Chartered Accountants of NZ (1953) and of The Chartered Institute of Corporate Management (NZ) (1954)</p> <p>Other training: industrial engineering, cost and management accounting and budgetary control, marketing, supervisory and management training and development in-house with employer. Professional examinations of the NZ Institute of Valuers 1974-1980 (sat and passed 13 of 14 units)</p>
<b>Languages</b>	English: mother tongue
<b>Professional Affiliations</b>	<p>Institute of Chartered Accountants NZ (Hon ACA retired) 1953-2005 The Chartered Institute of Corporate Management (NZ) (CCM) 1954-2001 Institute of Chartered Management Consultants NZ (CMC) 1974-1999 Institute of Directors NZ (Fellow) 1972-2001</p>
<b>Countries of Work Experience</b>	Australia, Bangladesh, Bahrain, Bhutan, Cambodia, East Timor, Fiji, Indonesia, India, Kiribati, Laos, Maldives, Malaysia, Mongolia, Nauru, New Zealand, Pakistan, Philippines, Singapore, Sri Lanka, Solomon Islands, Thailand, Tonga, Tuvalu, USA, Vanuatu, Vietnam.
<b>Key Qualifications</b>	<p>More than 30 years of professional experience in financial and economic analysis and management consulting with an emphasis in the last 20 years on the electricity supply industry.</p> <p>Experienced in the preparation and assessment of financial models of companies and projects.</p>

### **Employment Record**

From-To (Month/Year)	Employer/Position	Description of Duties
May 2003 – Present	Consultant to Wilson Cook & Co Limited.	Financial analyst and management consultant.
1962 - 1972 then 1974 - 2005	PA Consulting Group, Australia and New Zealand.	Specialised in the fields of financial and economic analysis, management information and systems, institutional development and strategic business and country planning.
1972 - 1974	Lockwood Buildings Ltd.	Rotorua, NZ, General Manager.
1952 - 1962	Skellerup Industries Ltd.	Christchurch, NZ, Company Secretary and Accountant.

## **Experience in the New Zealand and Australian Electricity Sectors**

**Consultant to the Economic Regulation Authority of Western Australia for Review of Expenditure Forecasts of Western Power's proposed Second Access Arrangement**

October 2008 – Present

**Consultant to the Australian Energy Regulator for Review of Expenditure Forecasts of the ACT and NSW Electricity Distributors**

November 2007 – Present

**Review of Prudential Requirements related to Isolated Electricity Supplies in NSW**

November 2007 – Present

**Electricity Distributors' Cost Pass-Through Application – Review for IPART**

January 2006 – April 2006

**Economic Regulation Authority of Western Australia – Review of Western Power's Asset Valuation and Expenditure Forecasts**

August 2005 – January 2006

**Office of the Tasmanian Energy Regulator – Mid-Term Review**

August 2005 – February 2006

**Review of DNSPs' Revised Estimates of Capex and Opex for NSW Regulator (IPART)**

September 2003 – October 2003

**Review of Electricity Distributors' Capital and Operating Expenditures for NSW Regulator (IPART)**

December 2002 – September 2003

**Review of Customer Capital Contributions for Electricity Connections (for IPART)**

March 2001 – October 2001

**Waikato Energy Group: Pricing Network Services, Hamilton, NZ**

1994

**Transpower Ltd – Review of Proposed Pricing Policies**

1991

## **International Experience in the Electricity Sector**

**Establishment of New Management Contract for ECTL**

November 2006 – March 2007

**Corporatisation of the Bangladesh Power Development Board, Dhaka, Bangladesh**

2006 – 2007

**Update of the Electricity Tariff Rationalisation Study for PT PLN (Persero)**

2004

**Preparation of the Assam Power Sector Development Programme, Guwahati, India**

2003

**Implementation Framework for IPP Projects Outside Java-Bali**

2002-2003

**Governance and Institutional Support for Private Sector Development, Sri Lanka**

2002

**Third Power Project Rehabilitation Loan, Sri Lanka**

2001

**Power Sector Restructuring, Sri Lanka**

2000-2001

**Evaluation of Hydropower Proposals, Solomon Islands Electricity Authority**

1999

**Privatisation Study of Electricity and Water Assets, Bahrain**

1998

**World Bank/Privatisation Commission of Pakistan**

1997

**Corporate and Financial Development of Electricité du Laos**

1996-1997

**Institutional Strengthening of Fiji Electricity Authority**

1996-1998

**Review of Technical and Financial Performance of Assam State Electricity Board, India**

1992

**Financial and Organisational Restructuring of Karachi Electric Supply Corporation**

1992

**Establishment of Lanka Electricity Co (Private) Ltd, Sri Lanka**

1985-1987