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SUBMISSION ON ELECTRICITY SECURITY OF SUPPLY POLICY REVIEW

1 Orion New Zealand Limited (*Orion*) welcomes the opportunity to provide our comments to Castalia on the *Electricity Security of Supply Policy Review* March 2007 (the *paper*).

Independent review

2 This paper is part of an independent review of reserve energy arrangements (the *review*). The arrangements consist of the reserve energy regime as set out in the government policy statement on electricity governance (the *GPS*), and the Electricity Commission's security of supply policy, which implements the regime.

3 The review aims to answer the following key questions:

3.1 What is the optimal security of supply standard for New Zealand?

3.2 Is it likely that the market will deliver this level of security by itself?

3.3 How have the current reserve energy arrangements worked?

3.4 What other approaches to achieving the desired security of supply should be considered, and how do they compare to the current Arrangements?

Castilia's recommendations

4 Castilia makes several recommendations as part of its review. In relation to procuring reserve energy, Castilia states:

> *There are two main aspects of the procurement approach that require improvement:*
>
> - *Setting a clear trigger for the procurement of additional reserve energy, and*
> - *Defining a clear process for how procurement would actually take place.*
>
> *With respect to setting a clear trigger, we recommend that the trigger for additional procurement should be expressed in terms of a desired energy margin. Our preliminary calculations indicate that the minimum desired energy margin would be between 11 and 17 percent. We recommend that the Commission should procure additional reserve energy when it becomes clear that the actual energy margin will fall below the minimum desired level.*
>
> *With respect to defining a clear process, we recommend that the Commission should define in advance the process and requirements for any future reserve energy tender. This should be relatively straight forward because it is clear that the most appropriate forms for any additional reserve energy required in the future are likely to be either:*
>
> - *Diesel- or gas-fired peaking plant (similar to Whirinaki), or*
> - *Contracted demand response.*
>
> *Defining the likely forms of reserve energy to be procured would also help facilitate a pre-consenting process by setting out detailed specifications for reserve generation (such as plant type and location). Pre-consenting sites for reserve generation would help reduce lead times for commissioning the plant, which would allow the Commission more waiting time to see if the market will respond, thereby reducing any distortion to the market.*

Orion's comments

5 We agree with Castilia that:

5.1 the most appropriate form of any reserve energy is diesel or gas-fired plant. We consider that rather than being similar to Whirinaki,

smaller diesel plants located close to load centres would be more appropriate;

5.2 in respect to the trigger for procurement of additional reserve energy being expressed in terms of a desired energy margin, we consider that it is not appropriate to just consider a single national margin. Any trigger for procurement of additional reserve energy must be expressed by region, and at a minimum, by North and South Island; and

5.3 the Commission should define in advance the process and requirements for any future reserve energy tender, including specification of plant type and location.

6 We expand on our reasons for this conclusion below.

Regional considerations

7 Orion considers that the North Island and South Island should be treated separately, from a reserve energy perspective, due to the potential for transmission constraints to create island-specific security of supply issues.

8 Given the presence of constraints on the grid, and sections that are more vulnerable than others (e.g. possible HVDC link problems), the Commission must ensure that dry year risks are assessed on a regional basis. This basis should be determined by where the constraints typically occur and how these become binding in any given inflow scenario. We illustrate below that grid constraints can create island specific issues.

9 Orion has previously commented on this regional-basis issue to the Commission[1]. While these figures may be slightly dated, we believe the principle remains and we therefore reiterate our previous comments:

> *This above point is clearly illustrated in the following extract from the NZ Electricity Outlook[2]. The extract contains two charts labelled Figure 1 and Figure 2 which are shown below.*

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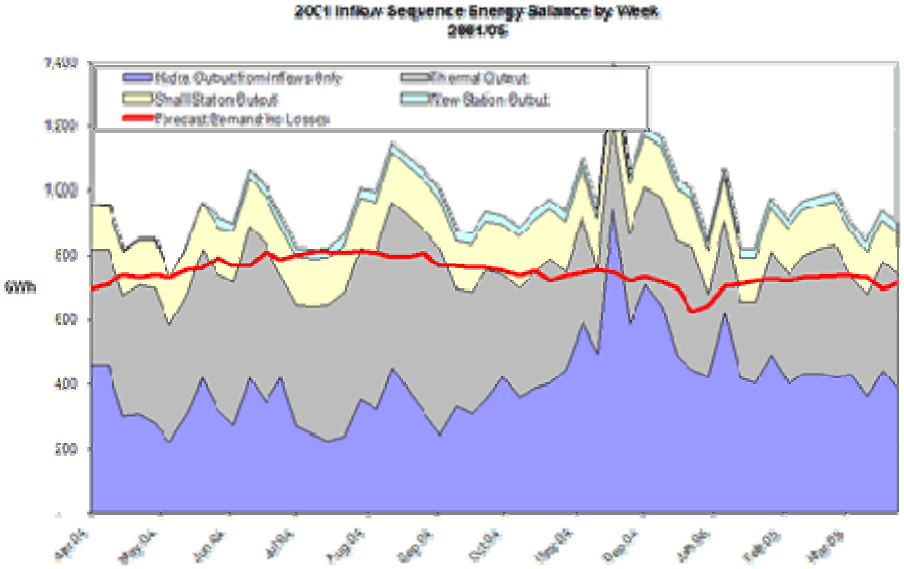
[1] Orion's submission in response to the issues raised in the Electricity Commission's discussion paper "Tendering for Reserve Energy", Dec 2004

[2] NZ Electricity Outlook Dry Year Security 2004/05 – 2007/08, September 2003, prepared by Energy Link for the Ministry of Economic Development.

"Another approach to examining security of supply is to look at the aggregate energy available and compare this with demand. The following chart shows the total potential energy from the 2001[3] inflow sequence plus all other available energy i.e. assumes all stations are run at available capacity.[4] The chart shows the demand as total energy rather than as peak demand.

Figure 1: Potential Energy Supply versus Demand under the 2001 Inflow Sequence



The above chart is interesting in as much as it indicates the potential for a brief supply problem at the end of June 2004. On face value, one might think that hydro storage could more than adequately cover this temporary shortage, also providing that little bit extra during daily demand peaks. However, it should be noted that the above supply and demand is taken on an aggregate national basis, i.e. it does not reflect any supply problems that can be caused by regional constraints in the transmission grid.

The chart below shows the potential output from all SI generators under the same "dry" inflow sequence charted against SI demand. The analysis also assumes full southward capacity transfers on the HVDC Link of 626MW at the sending end. Accordingly this chart takes account of the constraint imposed by the HVDC Link.

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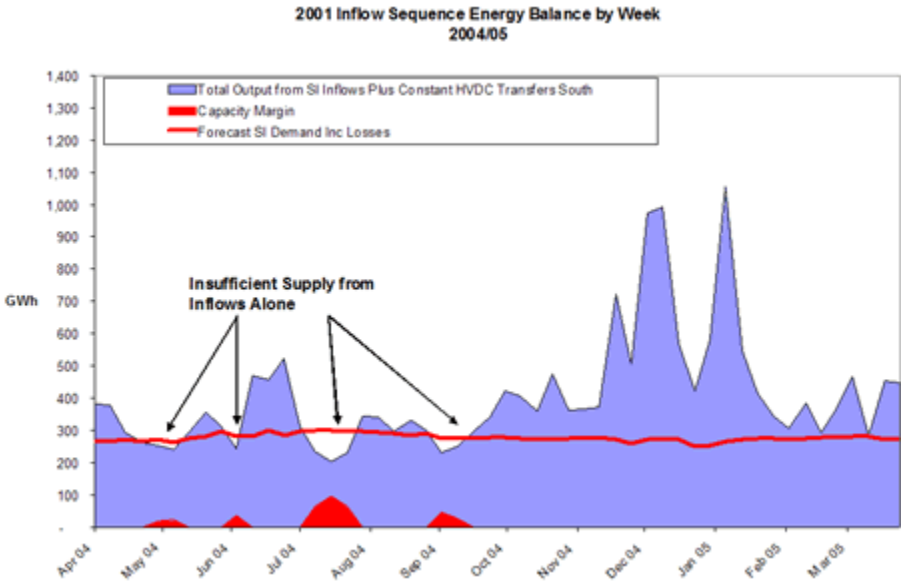
[3] over the period May through September, the aggregate available energy from the SI inflows in the 2001 year ranks 11th driest out of 72 inflow sequences, 1931 – 2002.

[4] This analysis takes into account the planned outages of the major thermals that have been modeled.

Figure 2: SI demand versus available energy under the 2001 inflow sequence



Given the limitations on southward transfers on the HVDC Link, it becomes evident that SI demand would have to be met by SI storage when the capacity margin is shown as being "in the red." In this example, a target capacity margin could be calculated where SI demand exceeds the deliverable energy from inflows.

Simplistically, dry year security of supply could be accommodated by ensuring at least the capacity margin is maintained as storage in the SI lakes. This approach, however, would be overly simplistic because, amongst other things, if the capacity margin were calculated against the driest year in 60, and storage limits enforced, there would be significant spill in other inflow years.

The conclusion is that the capacity margin over the nation as a whole is only just sufficient for a dry year, such as 2001, if nothing else goes wrong, and it is insufficient in the SI due to constraints on the grid.

10 Figure 1 illustrates that if the energy supply versus demand for New Zealand as a whole under the 2001 inflow sequences is considered, then the 2001 inflow sequence does not reveal any significant issues, except possibly a potential brief supply problem at the end of June 2004.

11 However, Figure 2 shows this same inflow sequence looking at only the South Island supply and demand and with full southward capability of the HVDC link. In this case the chart illustrates that the South Island will be short of capacity.

12 We also note that Tranpower's system security forecast for 2006 indicates in part D that:

Power system limits on the amount of HVDC transfer are required under certain power system conditions. Limitations on the HVDC North and South

transfer arise from the need to avoid voltage instability and assets reaching stated capability limits under steady state and contingent events.

13 The above clearly illustrates that whatever the final decision on the mechanism for establishing the volume of energy that the Commission decides is appropriate to keep in reserve, it must do so on a regional basis.

Location of reserve generation near main load centres

14 Orion believes that the Commission should consider the economic significance of locating generation relative to major load centres when deciding the amount of reserve generation required. Clearly, if generation can be sourced near main load centres then system security can be enhanced, line losses reduced, and possible constraints on the grid system avoided. This approach fits with the 'lifeline concept' to ensure continued operation of essential infrastructure assets, ports, hospitals and airports.

Multiple uses of reserve energy

15 Any review of policy relating to security of supply should consider the way in which reserve energy can be available to be used *"for other unexpected supply contingencies such as serious grid, plant or fuel supply disruptions"* as specified in the GPS (paragraph 47).

16 Orion considers that reserve generation can and should be multi-functional; apart from the uses noted in the above GPS extract it should also be available for supporting both distribution and transmission systems at peak loads.

17 The GPS (paragraph 56) states that:

The Commission should seek to minimise the impacts of the reserve energy scheme on the 'ordinary' market. The Commission should adopt a tight ring-fence whereby reserve energy may be used only for security of supply objectives, with the exception of distributed generation used for distribution network load management[5]. This will minimise the extent to which incentives to invest in ordinary generation and demand-side management are affected.

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[5] To ensure this exemption does not undermine the objective of a tight ring-fence, the Commission should define operating parameters carefully, including considering a cap on the MW capacity of the plant and on the number of hours a year the plant may operate for network management purposes.

18 Clearly the intent of paragraph 56 is to allow reserve energy from distributed generation to be used for both security of supply objectives and distribution network load management.

19 Even with the possible relaxing of the EIRA it appears unlikely that a distributor would be able to establish generation solely for distribution network load management. Unless appropriate reserve energy contracts are available this generation may not be available for either reserve energy purposes or network load management.

Recommendations

20 Orion **recommends** that the security of supply policy should try to ensure that the way in which reserve energy is contracted for allows:

20.1 for the consideration of the security of supply from at least a North and South Island perspective and possibly by smaller regions;

20.2 ensures that there is sufficient reserve generation contracted for in the South Island to ensure that security of supply can be provided for in the South Island; and

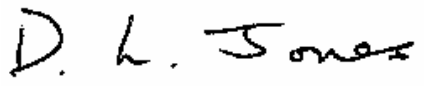
20.3 provides for multiple uses of reserve energy including distribution network load management.

Concluding remarks

21 Confidentiality is not claimed for any of the content of our submission.

22 Thank you for the opportunity to make this submission. If you have any questions relating to the submission, please contact Dennis Jones (Industry Developments Manager) DDI 03 363 9526 email dennis.jones@oriongroup.co.nz.

Yours sincerely



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