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Ms Karen Tilsed
Economic Regulation Authority
GPO Box 8469
Perth Business Centre
Western Australia 8649

Dear Ms Tilsed

New Facilities Investment Test – Medical Centre Substation

We are pleased to enclose our detailed comments on the submissions by Western Power and the North Metropolitan Area Health Service (NMAHS) on the Authority's Draft Determination on Western Power's New Facilities Investment Test (NFIT) application for the redevelopment of its Medical Centre Substation. We have also reviewed the Alinta submission but have no comments as this submission covers matters not directly relevant to our work.

Key points arising from our review of the submissions and a subsequent discussion with Western Power are highlighted below.

Cost Estimate

1. It is not completely certain that the upgrading of the Sir Charles Gairdner Hospital (SCGH) will proceed as the new Western Australian Government is reviewing the required investment in hospitals and associated facilities. If the upgrading does proceed the timing and detailed requirements for the new substation are, as yet, unclear.
2. The project cost estimate used by Western Power in its Regulatory Test Waiver and NFIT applications is based on a December 2006 estimate prepared for planning purposes. This estimate has been escalated to March 2008 costs using escalators determined by Western Power.
3. The escalators appear different for different line items, and would seem to be about 27% for environment management (dominated by civil construction costs) and 38% for gas insulated switchgear (dominated by electrical equipment

- procurement costs). The escalators appear extremely high, given that the time period between the base and escalated cost estimates is only 16 months and that underlying inflation over this period is likely to have been of the order of 3%.
4. The procurement cost of electrical equipment is strongly influenced by the costs of copper, aluminium and steel. Our brief internet search indicates that over the period June 2005-June 2006 steel prices were relatively stable, aluminium prices increased by about 60% and copper prices doubled. This volatility could in part explain the high escalator for GIS switchgear.
 5. Environment and land management costs are generally not industry specific and we would expect these costs to increase in line with general labour and civil construction costs. However, over this period Western Power was developing a new approach to project delivery, including an increased reliance on outsourcing, and this may have created an expectation of higher project costs. Nevertheless a cost escalation of 27% over a 16 month period would seem hard to justify.
 6. Commodity prices can be very volatile. Both copper and aluminium prices peaked in mid 2006 and have since been declining. Steel prices increased by around 50% in the first half of 2008 but have since fallen back to historic levels. In the last four months copper and aluminium prices have both fallen to around June 2005 levels as a result of the global economic downturn.
 7. Hence the substation cost provided by Western Power should be treated as a budgetary planning estimate only. It has not been tested by Western Power for efficiency and is likely to have significant inaccuracies, particularly if measured against current price levels. Given the escalators used and the current global economic situation we consider the estimated cost is probably high.
 8. Western Power acknowledges the limitations in the cost estimate provided for the NFIT application and has stated that it will not be used to determine any required capital contribution. Once SCGH has formally applied for an upgraded supply and the required in service date and detailed requirements are known, the design will be refined to allow a more accurate construction cost estimate to be produced, and the capital contribution model will then be rerun to determine the actual contribution required.

Scope of Works

9. Western Power has proposed a new ring bus configuration for the GIS switchgear that excludes the spare transformer and line bays as well as the bus section circuit breaker. The December 2006 cost of this arrangement is estimated to be \$2.23 million, which escalates to \$3.08 million after application of Western Power's escalation factor.
10. Western Power confirmed in its submission that a reduction in switchgear rating to 66 kV would reduce switchgear costs by about 10%, or \$0.31 million. It further indicated that a reduction in cable rating from 132 kV to 66 kV would reduce the cost of the incoming cable and line termination by 5.6%. This equates to \$0.25 million if applied to the NFIT estimate of \$4.47 million for this line item.

11. Western Power also provided a more detailed breakdown of its environment and land management costs. This breakdown includes construction items, such as transformer noise barriers, which in the initial report we assumed would have been included in other estimate line items. However Western Power has confirmed this was not the case and we now recommend that this cost be included in full.
12. Based on this updated scope of works we have revised the table of adjusted costs for the substation, as included as Table 2 in our original technical report. It should be noted that these costs are based on the costs provided by Western Power and have not been tested for accuracy. The adjusted project cost recommended in our original report was \$25.86 million, so the overall impact of this revised assessment is minor.

Adjusted Cost of Medical Centre Zone Substation Project

Item	Cost (\$ million)
Total project cost estimated by Western Power	28.37
Recommended reductions	
Reduction in switchgear rating	0.31
Reduction in cable rating	0.25
Reduction of switchgear configuration	2.30
Revised total project cost	25.51

Capital Contribution Model

13. In its submission the North Metropolitan Area Health Service (NMAHS) noted that no formal agreement had been reached to lease the substation land to Western Power at a peppercorn rental. Any rental below commercial rates would provide a benefit to Western Power (at least to the extent that the substation is used to supply customers other than SCGH), and this should be quantified and included in the capital contribution model. We agree with this in principle and note that inclusion of this benefit would reduce the capital contribution required of SCGH.
14. NMAHS also commented that Western Power's capital contribution model assumed that both project costs and tariffs would not increase in real terms, whereas all indications were that real price and cost increases were likely. We agree with this. However over the relatively long modelling time frames it is reasonable to assume that both costs and prices will change at a similar rate (albeit not necessarily the rate of inflation), given that costs are a key input to the price setting process. Hence a modelling assumption that costs and tariffs will not change in real terms over the modelling period, while not strictly accurate, is unlikely to result in a material error in the calculated capital contribution. The validity of the model structure, and the accuracy of the assumed initial project cost, would seem to be much more critical.

General

It is not clear to us that it is appropriate to apply the NFIT before detailed project requirements have been confirmed and a current construction cost estimate is available. Given that a waiver of the regulatory test has already been granted, there would seem to be little risk to Western Power if it proceeded with the project and retrospectively applied the NFIT. We understand that it is Western Power's policy not to commence construction on a regulatory test project without pre-approval of the NFIT and, given the time taken to process a NFIT application, it was necessary to rely on planning estimates for the pre-approval process, notwithstanding the uncertainty in respect of the detailed project requirements and the required in service date.

As noted above, Western Power proposes to recalculate the required capital contribution once final project requirements are confirmed and a more accurate construction cost estimate has been prepared. It has indicated that the amount to be rolled into the asset base would be the actual construction cost less any agreed capital contribution. It is not clear what will happen if either the construction cost estimate, or the actual cost outcome are significantly different from the planning costs on which this NFIT is based. Given the uncertainties in respect of both project requirements and current costs, we consider such a scenario to be likely.

Yours sincerely

Geoff Brown
DIRECTOR

APPENDIX TO LETTER TO ECONOMIC REGULATION AUTHORITY DATED 18 FEBRUARY 2009

COMMENTS ON WESTERN POWER SUBMISSION

Section	WP Submission	Comment
2.3	Assets should be replaced on condition rather than at the end of their stated service life and that service lives can be extended through prudent maintenance and asset management practices.	<p>We agree in principle with Western Power that asset replacement should be based on condition rather than on age alone, and also that actual asset lives can be extended through prudent maintenance practices. However we believe that the issue is much more complex than implied in the submission. In particular:</p> <ul style="list-style-type: none"> • As noted in our report, the actual economic service life of a specific individual asset cannot be predicted with certainty and will vary from asset to asset. Factors influencing the life of an individual asset include the quality of manufacture, the magnitude of the loads that are imposed on it during its service lifetime, the external environment as well as the quality of asset management and maintenance. • The asset life used for accounting and analysis purposes should be meaningful from an engineering perspective. This life is normally taken to be the mean or average life of all individual assets in a particular class. The actual lives of individual assets in a particular asset class can be expected to follow a normal distribution around this mean. • Replacement of the Medical Centre substation in 2015/16, as indicated by Western Power in Section 3.3 of its regulatory test waiver application implies an asset life of 55 years, which we believe is reasonable for power transformers, even after taking into account the effect of standard asset management procedures. An asset life of over 60 years, as indicated by an assumed replacement in 2020/21 is high for this class of asset. We note that the asset serves a major hospital and believe that because of this a conservative approach to planning asset replacement should be taken. • The Western Power analysis implies that, given satisfactory asset management, the risk of failure of an asset is independent of its age. We do not agree – when assets are approaching the end of their life the risk of failure increases significantly with age. Western Power acknowledges this but considers that the risk can be managed through its standard asset management procedures, thereby justifying its age-independent asset risk assumption. Our view is that the 55 year life already assumes standard asset management procedures and the risk associated with keeping the assets in service longer than this is real. Assuming that the SCGH redevelopment did not occur, the cost of managing this risk, and of the premature replacement of an asset should it fail would rest with Western Power. A major benefit to Western Power from the early substation replacement is the mitigation of this risk, but this benefit is not quantified or taken into account in the cost-benefit analysis.
2.3	Where new customers are of sufficient size to bring forward work that would have been	We agree with the basic principle, as expressed by Western Power. The issues raised in our original report relate to the validity of the methodology used by Western Power to determine the required capital

	<p>undertaken at some point in the future, it is appropriate to ensure that the new customer funds the cost difference so that the general customer base does not have to pick up some of the cost through higher tariffs. In the case of the Sir Charles Gairdner Hospital, an assessment has been made as to their impact on network costs and a capital contribution has been determined on the basis of there being no net cost to other customers</p>	<p>contribution.</p> <p>We consider that the main risk faced by Western Power is that the forecast loads provided by SCGH as used as a basis for network planning and economic analysis do not materialise. This risk of stranded overcapacity is real as designers tend to take a conservative approach to load forecasting due to the embarrassment and potential liability should the internal electrical distribution system within the hospital prove to have insufficient capacity. The overcapacity risk is exacerbated by the low growth potential of the other loads supplied by the Medical Centre substation.</p> <p>Indications are that this risk would be low if an area wide approach was taken to network planning. Upgrading the distribution voltage to 11 kV will substantially increase the power transfer capacity at distribution voltage level. This means that spare capacity at the Medical Centre substation could be used to offload neighbouring substations, thereby deferring or avoiding the need to install additional transformer capacity in these substations.</p> <p>If however further economic analysis shows that the risk of stranded overcapacity is significant, it would be better managed by including a take or pay provision in the SCGH access contract.</p>
3.1	<p>Ultimately, the value that Western Power will seek to include in its asset base will be reflective of the actual costs incurred once the work is undertaken.</p>	<p>A major component of Western Power's NFIT pre-approval application is the magnitude of the capital contribution to be paid by SCGH. If this capital contribution is to be determined in advance, the determination has to be based on reasonable assumptions and cost estimates, as well as a methodology based on robust economic principles.</p> <p>Western Power has advised that the estimates provided in its regulatory waiver and NFIT applications are based on an December 2006 estimate, which was prepared for planning purposes, and which has been escalated to March 2008 costs. At this stage the design requirements of the substation have not been finally determined and the required commissioning date is not known. As the new Western Australian Government is reviewing the investment requirements for West Australian hospitals it is possible that hospital expansion will not proceed at all. Once the SCGH's actual requirements have been confirmed and a decision has been made to proceed, a new more accurate construction estimate will be prepared and this will form the basis for negotiating the actual capital contribution to be paid by the hospital.</p> <p>The factors used to escalate the cost estimate to March 2008 have not been justified and are extremely high, particularly when compared to the underlying inflation rate. At this stage the Authority is being asked to base its decision on what is essentially a budgetary planning estimate with a low level of accuracy.</p>
3.1	<p>Western Power has a long term plan to convert the substations of University, Nedlands and Medical Centre (at SCGH) to 11 kV and in fact planned to convert this substation in 2020.</p>	<p>The calculated capital contribution is very sensitive to the assumed baseline conversion date of 2020 and Western Power has not provided a satisfactory explanation of the basis for this assumption. As noted above the regulatory test waiver application stated that the transformers would need to be replaced by 2015/16.</p>
3.2	<p>As an initial comment it should be noted that standardisation of equipment is strategically important to any electricity utility. There are long term benefits in a number of areas including:</p> <ul style="list-style-type: none"> • The higher volumes of equipment or materials purchased under standard contracts normally 	<p>This comment indicates that the economic benefits of standardising on 132 kV equipment would reduce the life cycle costs to Western Power. Although no quantitative analysis is provided, the argument is used to support a higher initial capital cost (which Western Power believes should be paid by SCGH though a higher capital contribution).</p> <p>Our initial report provides a view of an efficient cost without taking account the benefits raised by Western Power and we believe it provides an appropriate baseline for the economic analysis. If the benefits of</p>

	<p>means that a better price can be obtained;</p> <ul style="list-style-type: none"> • It will normally reduce the lead time to obtain materials because manufacturers will either have stock available or will be able to produce new stock without having to do a special run just for a low volume product; • There is a lower cost to the utility in carrying spares and in operations and maintenance activities when there is standardisation; and • Standardisation normally takes into account future expansion or upgrades such as voltage changes. <p>Western Power has not tried to quantify these benefits in this particular submission. However it does submit to the Authority that any deviation from a policy of standardisation has significant consequences and such a decision cannot be taken lightly.</p>	<p>standardisation and other issues can reduce the life cycle cost to below that implicitly assumed in our analysis then Western Power's design should be implemented, notwithstanding our analysis. This would in no way indicate that the analysis in our report is not valid. Furthermore, if the benefits of standardisation are to be accrued by Western Power, then it should pay the higher capital cost rather than try and pass this on to the SCGH.</p>
<p>3.2</p>	<p>The total 132 kV single bus GIS cost at \$557,000 per circuit for the seven circuits considered in the original submission for the Medical Centre substation (3 lines, 3 transformers and 1 bus section switch) gives a total installed cost of \$3.9 million.</p>	<p>The cost of \$3.9 million is at variance with the \$5.38 million cost for GIS switchgear in the NFIT application – see Table 1 of the GBA report.</p> <p>Western Power has clarified that the \$3.9 million is a December 2006 cost and the \$5.38 million is an escalated March 2008 cost. This implies an escalation factor of 38%, which, notwithstanding the significant increases in the cost of primary electrical equipment experienced since about 2004, we consider high given that the period between the base and escalated estimates is only 16 months. The cost of electrical plant is largely driven by commodity prices and the estimate was prepared before the true impact of the current global economic recession was apparent. Western Power accepts that the escalation factors that it has used may prove high but says that the capital contribution required from SCGH will be based on the updated construction estimate.</p>
<p>3.2</p>	<p>Western Power's only existing GIS 132 kV switchboard is in the Cook St substation in West Perth. This switchboard has been developed in stages over several years with circuits being added as and when required. The risk of not catering for the future circuits is that compatible equipment might not be available to extend the switchboard because of the tendency for manufacturers to change their designs overtime.</p> <p>The resulting problems can be serious. This could result in very high costs for equipment needing to be made to order. Operationally, there could be</p>	<p>The difficulty in expanding GIS switchgear was discussed in our original report. Western Power's statement that such expansion has already taken place at Cook Street on a number of occasions indicates that our own concerns may have been overstated. We note that any compatibility problems will remain, irrespective of the bus arrangement used.</p> <p>We are not fully convinced of the argument submitted by Western Power for a ring bus since the same benefit could be derived from an isolating switch at the end of the single bus. However, there are other operational benefits from a ring and it is reasonable to capture these if the cost is small. Our main concern was the cost of providing for a third line and transformer, given our assessment that the likelihood of these being needed within a reasonable planning period was low. This issue has now been resolved.</p>

	<p>long outages on busbars to add new circuits with the consequence that vital sections of the transmission system could be out of service for extended periods.</p> <p>The fact that Cook St has a single busbar configuration adds to the problem in that sectionalising (opening) of the busbar for any reason can result in more severe consequences on transformer and line security than alternative configurations.</p>	
3.2	<p>It is worth noting that Western Power has reviewed its forecasts and plans for the new Medical Centre substation. The revised load forecast indicates that a 3rd transformer will be required at this site in approximately 20 years.</p>	<p>In our report we noted a discrepancy between the Western Power planning forecast and load information provided by the SCGH. We also concluded it unlikely that a third transformer would be required, based on what we consider realistic growth rates for a fully developed supply area. Western Power has not commented on this analysis and not discussed the basis for its new forecast.</p> <p>We note that this issue is less relevant in the light of Western Power's decision only to install the GIS switchgear immediately required.</p>
3.3	<p>Environment and land management costs.</p>	<p>We assumed that these costs related to obtaining the necessary consents to allow construction to start. In its submission Western Power provided a more detailed cost breakdown of this line item. The majority of cost components identified by Western Power in the breakdown are construction costs which, in our view, should have been included in other cost line items. For example, noise enclosures are a civil works cost and soil remediation is a cost associated with decommissioning the old substation.</p> <p>However, Western Power has confirmed that these costs have not been provided for elsewhere in the cost estimate and we now recommend that this cost be included in the adjusted NFIT estimate. We note that inclusion of this cost does not imply acceptance of its accuracy, given our concerns regarding the overall accuracy of the estimate.</p>
3.4	<p>Net benefits test.</p>	<p>We have concerns about the validity of an economic cost benefit analysis that excludes benefits because they are difficult to quantify but includes current costs that are required only to mitigate possible longer term costs that have a relatively low probability of actually being incurred.</p>
3.5	<p>Western Power therefore submits that the issue of changing the substation because it has reached the end of its economic life is not relevant in this deliberation</p>	<p>The capital contribution determined from the Western Power analysis is very sensitive to the assumed date at which the substation would have been replaced if the SCGH expansion had not occurred. Primary assets used in electricity transmission and distribution do not have an infinite life, and when assets are approaching the end of their economic life the risk of failure increases with age, notwithstanding prudent asset management and maintenance. As the Medical Centre Substation already supplies a critical hospital load, we believe a conservative approach to the management of this risk is appropriate.</p>

COMMENTS ON NMAHS SUBMISSION

Para	NMAHS Submission	Comment
3	<p>Generally NMAHS believes that Western Power has not provided sufficient information to enable the technical efficiency of the project to be appropriately assessed. In our opinion Western Power should provide to the ERA a detailed cost estimate showing the basis upon which the \$28.4 million costs have been determined.</p>	<p>We believe that sufficient information has been provided by Western Power to allow the technical efficiency of the project to be generally assessed, although relatively minor issues at the margins remain. Resolution of some of these issues is contingent on SCGH finalising its requirements.</p> <p>The more relevant issue is the accuracy of the cost estimate. Western Power has now advised that the budget is based on a 2006 budgetary cost, prepared for planning purposes, and that a more accurate construction cost estimate will be prepared once it is clear that the project will proceed and the timing has been confirmed. The required capital contribution will be determined using this more accurate cost estimate. Construction costs are currently very volatile and Western Power is no longer claiming that the cost estimate is accurate.</p>
4.	<p>Western Power's model does not allow for any increase in prices in real terms above that of inflation.</p>	<p>This is true. However, in its model Western Power has assumed that both real costs and real tariffs will be the same in 2020 as in 2011. This is a sustainable business model. We would expect that over the time frames used in the model, costs and tariffs will change at a similar rate (but not necessarily at the rate of inflation). If this assumption holds then a material error in the calculated capital contribution would seem unlikely.</p> <p>The more critical issues are the accuracy of the assumed initial project cost and the validity of the capital contribution model from an economic perspective.</p>
21	<p>Western Power's calculation of the "brought forward cost" does not include any capital cost escalation in real terms,</p>	<p>See comment on Paragraph 4 above.</p>
28	<p>Land values</p>	<p>Western Power stated in its submission that it would rent the land from the SCGH at a peppercorn rental. The fact that Western Power can use the land at minimal cost is a material benefit, which has not been taken into account in its capital contribution model. If this benefit was included in the model, it would reduce the capital contribution required of the SCGH.</p>