



**AESO 10-Year Plan (2007-2016) Stakeholder Meeting – November 2, 2006
Stakeholder Questions/Comments and AESO Responses
November 30, 2006**

The AESO would like to thank those stakeholders who have taken the time to ask questions and provide comments about the second stage of the development of the 10-Year Transmission System Plan (2007-2016):

The AESO will use these questions and comments to update the preliminary draft of the 10-Year Transmission System Plan (2007-2016) as necessary, and assist the AESO through the next stage of the development of the plan in identifying possible alternatives.

The meeting was attended by stakeholders from the following organizations:

AltaLink Management Ltd.
ATCO Electric
ATCO Power
Canadian Natural Resources Ltd. (CNRL)
City of Medicine Hat
CRD Energy Services
Depal Consulting Limited
DJ Hammond Consulting Inc.
ENMAX Power Corporation
EPCOR Alberta
EPCOR Utilities Inc.
Fortis Canada
FortisAlberta
HATCH Energy

Independent Power Producers Society of Alberta (IPPSA)
John MacCormack & Associates
Kennedy & Associates
Lawson Lundell LLP, Barristers & Solicitors
Montana Alberta Tie Ltd. (MATL)
Powerex
SNC Lavalin T&D
Soverus Inc
The Cogent Group Inc.
TransAlta (TAU)
TransCanada
Utilities Consumer Advocate
Valeo Power
Vision Quest
WestWindeau Inc.
Wind Power Inc.

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<p>STAKEHOLDER CONSULTATION PROCESS</p>	<p>1) CRD Energy Services: The AESO has not identified any solutions in the preliminary draft report. Are you only identifying issues at this time?</p> <p><i>AESO: Yes. The stakeholder consultation process for the 10-year Transmission System Plan (2007-2016) is a 3 stage process. At this meeting, the second stage, the AESO has identified issues that have arisen during the regional and bulk transmission system studies. The AESO believes this stage is an important step in the development of the plan in order to facilitate a more focused discussion on alternatives in stage 3 of the process tentatively scheduled for early December.</i></p>
<p>GENERAL</p>	<p>2) WestWindeau Inc.: Throughout the draft document the AESO uses the Category A, B, C nomenclature. This practice creates confusion and lacks transparency as certain Category A base conditions begin with an element out of service such that the Category B event is really a two element outage instead of an single element outage. Therefore, to ensure clarity and transparency it is requested that the AESO clarify the outage conditions used in each case whenever it refers to a Category A, B, C, etc. event. This can be done by simply including a brief “N-1” or “N-2” or “N-1-G” etc. description as part of the event description.</p> <p><i>AESO: The text of the report will be revised to explain these matters. While it is true that there are NERC categories A, B, C, and D, the only studies carried out specifically for this 10-Year Plan were of Category B (often referred to as N-1) contingencies. The text of the report does occasionally mention additional contingencies and conditions. These are cases where regional studies are underway for stakeholder comment and/or where the conditions noted are notably obvious. Category B contingencies are specific to certain types of elements, and may include variations of pre-contingency dispatch conditions, so referring to Category B contingencies as “n-1” is in fact overly simplistic. The AESO refers interested parties to the AESO's Reliability Criteria, provided on the AESO's website.</i></p> <p>3) TransCanada: Will the AESO look at Category C and D Events for the 10 Year plan? Will it include a section in the 10 Year plan?</p> <p><i>AESO: The AESO will study Category B events for the purposes of the 10-Year plan. Category C and D events will be studied as a part of the detailed need application stage of specific area planning studies.</i></p>

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	<p>4) WestWindeau Inc.: Does the work behind the 10 Year Plan examine the system conditions for each year from 2006 to 2016, or does the work only look at the system conditions in the year 2016? If the work examines the system conditions for each year, please include in the summary discussion of section 4.5 a table or chart that shows when the first year in which cut-plane transfer limits are violated (for each cut-plane).</p> <p><i>AESO: Studies were performed for the year 2016 only; no intermediate years were studied. The AESO believes performing these studies will provide a “roadmap” or “snapshot” of the transmission system over the next ten years, based on the knowledge we have today.</i></p> <p>5) TAU: TransAlta recommends that the AESO develop a 10 year transmission plan that is robust enough to allow for more generation development in each area than only that generation identified in the assumptions. The 10 Year Transmission Plan should facilitate generation development rather than dictate where generation will take place.</p> <p><i>AESO: The AESO does not dictate where generation should locate. Section 29 of the Electric Utilities Act states the AESO must provide system access service on the transmission system in a manner that gives all market participants wishing to exchange electric energy and ancillary services a reasonable opportunity to do so. Section 2 of the Transmission Regulation states the AESO is required to anticipate future demand for electricity, generation capacity and appropriate reserves required to meet the forecast load so the transmission facilities can be planned and are available in a timely manner to accommodate the forecast load and new generation capacity. The AESO believes, for the purposes of the 10-Year Transmission System plan and in accordance with its duties, studying a number of scenarios accomplishes the facilitation of generation development in Alberta.</i></p>
<p>LOAD ASSUMPTIONS AND GENERATION SCENARIOS</p>	<p>6) WestWindeau Inc.: As previously stated to the AESO, in our September 15th Generation comments letter, the context of these comments are meant to focus the AESO on its obligations under section 4 and 8 of the Transmission Regulation. These sections require that the AESO plan the transmission system so that transmission is not a constraint in locating and operating generation or servicing load requirements. Importantly, these requirements apply universally to all types of generation and therefore it is important that any transmission plan is sufficiently flexible to accommodate changing market conditions and the associated range of generation mix</p>

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	<p>this is plausible over the next 10-plus years.</p> <p><i>AESO: Please refer to the response to question 5.</i></p> <p>7) EPCOR: EPCOR would also like to reiterate our concern that the AESO’s use of the reserve margin as a simplified proxy for market price signals may be of limited value. As mentioned previously, incremental generation investment decisions are based on investor forecasts of energy prices (including electricity, natural gas and coal) and general market conditions and growth expectations, not on a reserve margin metric published by the AESO. Investment response to price signals is a key feature of Alberta’s energy only market.</p> <p><i>AESO: The AESO takes note of this point. Please refer to the answers provided to questions 29 and 30 in the Stakeholder Questions/Comments Matrix and AESO Responses dated October 26, 2006.</i></p> <p>8) WestWindeau Inc.: Where on the AESO’s website is the Load Forecast?</p> <p><i>AESO: The load forecast or “Future Demand and Energy Requirements (Period: 2006-2027)” can be found following the path Transmission > Planning > Load Forecasting or click here to view the document.</i></p> <p>9) WestWindeau Inc.: Are the load numbers used for the 10-Year Plan the same as in this document?</p> <p><i>AESO: The “Future Demand and Energy Requirements (Period: 2006-2027) is a long term forecast based on GDP. The Transmission Planning department is aware of several projects which, if are all built, would cause loads to be higher in the short term. The AESO considers it prudent to have plans that take into account the somewhat higher short term growth than indicated by the GDP forecast. These plans will be revised at the need application stage and should some of the projects contemplated drop off at that time; the AESO will adjust the proposed transmission enhancements accordingly.</i></p> <p>10) WestWindeau Inc.: The Future Demand and Energy Requirements (2006 to 2027) document which describes the load forecast used in the 10 Year Plan shows AIES energy growing at 2.0% for 2006; on the other hand the historical AIL volumes from the Pool</p>

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	<p>page shows a year-to-date growth (to end of October) of 3.8%. Recent bank forecasts estimate the real GDP in Alberta to be growing at nearly 7% for 2006 and over 4% for 2007. Accordingly, there is a significant concern that the AESO's starting point for the load forecast (both energy and peak) is too low and this will reflect on the load estimate for later years. The AESO is requested to revise its forecast to reflect current economic activity.</p> <p><i>AESO: Please refer to the response to question 9.</i></p> <p>11) WestWindeau Inc.: Since the load forecast is unusually low relative to the rest of the province, please conduct a scenario using a load forecast of 2% or more per annum (as requested above). What affect does this have on the "issues" and "alternative developments"?</p> <p><i>AESO: Please refer to the response to question 9.</i></p> <p>12) WestWindeau Inc.: Table 1 of the Draft 10 Year Plan shows the system and regional load forecast for the 2006 and 2016 as well as the average annual growth rate. The growth rate for the South region is reported as 0.5%. No other region has a growth rate below 1.7%. This discrepancy appears to reflect on the historical balance of economic activity in the province and is not reflective of future regional growth. The AESO is requested to re-examine the regional load growth in the south and directly engage those southern communities in an examination of how its forecast compares to the forecast of the regional economic development agencies in southern Alberta.</p> <p><i>AESO: The load forecast presented in table 1 was in error. The corrected table 1 in the second draft report shows the growth rate in the south region as 1.5%.</i></p> <p>13) WestWindeau Inc.: Section 5.1.2. The AESO states that the South region load is forecast to grow at 0.5%. Please corroborate this forecast with information from the economic development agencies of southern Alberta.</p> <p><i>AESO: Please refer to the response to question 12.</i></p> <p>14) CRD Energy Services: What are the load assumptions for the south area studies?</p>

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	<p><i>AESO: The AESO used summer coincident peak load and Category B contingencies.</i></p> <p>15) TransCanada: Is the south area a summer peaking load area?</p> <p><i>AESO: Predominantly yes. The south area, as defined in the preliminary draft of the 10-Year Transmission System Plan (2007-2016) is summer peaking whereas the Calgary and Central areas are predominantly winter peaking.</i></p> <p>16) ENMAX: There is a 2.3% growth rate for system peak in the Calgary area stated in the report. We believe this is too low; there was a 3.19% winter peak growth rate and a 3.05% summer peak growth rate. Please respond.</p> <p><i>AESO: The AESO believes that a 2.3% growth rate for system peak is reasonable for the 10-Year period. However, as we move forward into the need applications for Calgary, the AESO will coordinate with ENMAX to review the load forecast.</i></p> <p>17) EPCOR: The AESO's report Future Demand and Energy Requirements provides answers to some questions EPCOR asked in our September 15 letter, with respect to Conference Board of Canada assumptions for GDP growth, population growth and crude oil prices. However, it is not clear from this document what assumption has been used for natural gas prices, nor is it evident whether or not forecast electricity prices have been used to forecast future load. EPCOR suggests that any forecast of load is not complete without incorporating a forecast of electricity prices.</p> <p><i>AESO: The AESO appreciates the suggestion and will review its load forecasting process accordingly.</i></p> <p>18) WestWindeau Inc.: Section 4.5.1 identifies four different loading conditions, all of which are variations of Summer conditions. Please clarify whether the AESO has used Winter load conditions in any of the case studies. If this is the case, please explain why the AESO is no longer planning for winter peak load conditions.</p> <p><i>AESO: In performing the studies, known and expected transmission system improvements were added to the existing transmission system model. The generation additions described above were also added to the models. The system was then studied with the expected conditions for 2016.</i></p>

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	<p><i>(The specifics are described in the draft report.)</i></p> <p><i>In each case, generation and load conditions were simulated that would most stress the transmission system being studied. This means that the bulk system and many of the regions are evaluated for other than system winter-peak conditions. In the south, for instance, the system will be most stressed during summer conditions. And the north-south transmission system will be most stressed at load levels less than peak when the northern load is less than the base-load generation. The northwest, in contrast, will be most stressed during winter peak conditions.</i></p> <p><i>Summer conditions are usually the most stressing for the transmission system in assessing thermal transfer capacity requirements. This is true even though the loads may be higher in the winter. The reason is that the thermal limits on the transmission facilities are lower in the summer than in the winter. Since the winter loads in most of Alberta are only slightly higher than summer loads, the reduced summer ratings generally result in the most restrictions for transmission system operation.</i></p> <p><i>The studies for the bulk system were different from the regional studies in that they considered a range of load and generation patterns that would stress the various bulk system transmission cut-planes. These are discussed in the draft report.</i></p> <p>19) WestWindeau Inc.: Why is Figure 13 based on “spring night time high export” when the loading scenarios reported in section 4.5.1 indicate only “summer conditions”.</p> <p>AESO: <i>This is a stressed condition as discussed in response to question 18.</i></p> <p>20) ENMAX: Given that the Calgary area is still a winter peaking area, ENMAX believes it would be prudent to test the transmission system against at least one winter load and generation scenario.</p> <p>AESO: <i>Please refer to the response to question 18.</i></p> <p>21) WestWindeau Inc.: Throughout the draft document the AESO provides a brief description of the generation and load assumptions used when evaluating a cut-plane or regional system stress. The AESO is asked to provide additional details surrounding the assumptions specific to each evaluation. This should include at a minimum response to the following: what generation units are assumed to be operating and how much output</p>

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	<p>is provided by each and collectively? What assumption is made regarding load: is it at system coincident peak, regional coincident peak and what is the level of consumption in MW terms? An example of where the lack of details creates confusion and a lack of transparency is in section 4.3 (“The Situation Today”). There a number of violations of the criteria are reported yet is it not clear whether these violations are based on “today’s” generation and peak load or the 2016 generation? Additionally, it is not clear when loading conditions are used whether they are consistent with the seasonal generation capability and whether they are coincident with system or regional peaks, non-coincident, nor the level as measured in MWs.</p> <p><i>AESO: The bulk system cut-planes were evaluated for a number of typical load and generation conditions each designed to stress the cut-plane being studied. The AESO will not provide details regarding the generation dispatch as providing this data could disclose sensitive market information. The descriptions of the conditions in the text will be enhanced.</i></p> <p>22) John MacCormack & Associates: What is the current level of load growth in the Northwest area?</p> <p><i>AESO: The compound annual load growth in the area is forecast to be 1.8% over the ten year period.</i></p> <p>23) John MacCormack & Associates: In the preliminary draft report, the Daishawa and P&G generators are not shown in Table 3. Have they been retired?</p> <p><i>AESO: Neither the generation nor the loads for these units were used in the forecast.</i></p> <p>24) WestWindeau Inc.: Please include in the form of a table summary the criteria violations by element for each load and generation scenario cases used to study each cut-plane. (Section 4.5)</p> <p><i>AESO: With existing and expected system additions, the capability of the NW cut-plane will be much higher than the stress levels so contingencies do not need to be reviewed. In the NE, the system is highly stressed under all conditions for nearly any contingency, so listing all of them in a table would not be useful. The WECC path 2 cut-plane (Alberta–Saskatchewan) was not studied for this 10-Year Plan, so there is nothing to report. The information requested for the other cut-</i></p>

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	<p><i>planes—SOK, South, and Alberta—WECC— will not provide any additional insight as the report already contains reasonable information. Additional information and examples will be added to the text for these cut-planes.</i></p> <p>25) WestWindeau Inc.: One possible solution to the issue of integrating wind generation into Alberta is to couple wind facilities with storage facilities such as large hydro, pumped-hydro or compressed air energy storage (CAES). The AESO is requested to include a generation scenario where 3000 MW of wind is added along with one or more storage facilities in southern Alberta. The scenario should discuss the ability of the South cut-plane to manage transfer to Calgary, Central Alberta and the A/BC and A/S inter-ties. Additionally, please discuss how the south cut-plane and south region plans would change if wind facilities are coupled with storage.</p> <p><i>AESO: The 10-Year Transmission System plan will describe what is required for a transmission solution to permit the integration of a large increase in wind generation. Specific wind projects coupled with storage facilities will be studied as part of the need application process.</i></p> <p>26) WestWindeau Inc.: In reviewing the 10-Year generation plan why were additional storage options not considered in the scenarios that may be developed inside Alberta such as Compressed Air Energy Storage, Pumped Hydro etc that may be incorporated in the large scale solution to wind variability and actually enhance the capacity value for renewables?</p> <p><i>AESO: Please refer to the response to question 25.</i></p> <p>27) WestWindeau Inc.: Section 5.5.4.2. The AESO says in this section: “Planning for a transmission system that is capable of handling the full range of all contracted DTS and STS will result in large capital investments. On the other hand planning for only the high load factor DTS and STS contracts can result in congestion and possible violation of the AESO’s Reliability Criteria. The solution is to find the most likely maximum load and supply scenarios that the Fort McMurray region will experience during the next 10-Years.” (emphasis added)</p> <p>a) Please provide some clarification as to what the AESO means by “finding the most likely maximum load and supply scenarios”? How is this different than using the</p>

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	<p>11 generation and 4 load scenarios? Will the AESO select only one scenario of them all and commit to a plan based on only one scenario?</p> <p><i>AESO: The AESO's statement "finding the most likely maximum load and supply scenarios" refers to the AESO utilizing conditions specified in the Northeast Alberta Service Requirements Forecast Report specific to the northeast region. For the purposes of stressing the bulk transmission system, the AESO used 11 generation and 4 load scenarios for the 10-Year plan. The 10-Year Transmission system plan is not a commitment to a plan but rather a "roadmap" or "snapshot" of the transmission system over the next ten years, based on today's knowledge. The AESO will provide a recommendation to the Alberta Energy and Utilities Board once specific area planning studies are completed and a need application is developed. Clarification of this point will be included in the next draft of the report.</i></p> <p>b) Please explain if the AESO proposes to use a probabilistic approach to planning for the NE region. How will the AESO calculate the probabilities of load and generation? What percentage of events will go un-served or fall outside acceptable reliability criteria; e.g. the AESO will plan so that the reliability criteria will be expected to meet 99% of the time and that in 1% of the time the AESO will require RAS schemes to maintain reliability?</p> <p><i>AESO: With respect to probabilistic transmission planning, the AESO does not intend to apply an approach as presumed by the question to assess the transmission needs in the Northeast. The AESO intends to incorporate probabilistic planning techniques by including an element of probability to establish reasonable and practical load and generation assumptions from which to perform its need analysis. Once the need has been established, the AESO performs transmission planning studies in accordance with the deterministic approach as defined in the AESO's Reliability Criteria. Please click here to view the Northeast Alberta Service Requirements Forecast Report or click here to view the Stakeholder Questions/Comments and AESO Responses Matrix regarding the above-stated report.</i></p> <p>c) Once the AESO has provided greater clarity on how it proposes to use the load and generation scenarios or probabilities to plan for the NE region, please describe how this approach is permitted under the Transmission Policy and Transmission Regulation.</p>

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	<p>AESO: <i>Under the Transmission Regulation, Part 1, Section 2(a), the AESO is required to anticipate future demand for electricity, generation capacity and appropriate reserves required to meet the forecast load so that transmission facilities can be planned and are available in a timely manner to accommodate the forecast load and new generation capacity.</i></p> <p><i>In all the other planning studies, the AESO uses a coincidence factor on the total DTS value to produce the peak demand for that area. The coincidence factor varies from area to area based on historical values. In the case of the Northeast area, a coincidence factor will be developed using a proactive approach to determine realistic levels for load and generation. Please click here to view the Northeast Alberta Service Requirements Forecast Report.</i></p>
<p>REGIONAL ISSUES IDENTIFIED</p>	<p>28) CRD Energy Services: Please identify the event and duration of voltage violations specific to each area.</p> <p>AESO: <i>The tables provided in the regional and bulk sections preliminary draft report of the 10-Year Transmission System Plan (2007-2016) identify the event of the voltage violations specific to each area. The AESO has not assessed the duration of exposure particular to each event.</i></p> <p>29) CRD Energy Services: Do the voltage violations occur at all hours and at any load level or are they based on contingencies?</p> <p>AESO: <i>Voltage violations stated in the preliminary report are based on the coincident peak of the specific area being studied, and occur due to a contingency outage.</i></p> <p>30) John MacCormack & Associates: Are the transmission reinforcements in Northwest Alberta approved by the AEUB on schedule with the application?</p> <p>AESO: <i>Currently, the schedule for the approved transmission reinforcements into the Northwest area are as follows:</i></p> <ul style="list-style-type: none"> ○ <i>240 kV Wesley Creek to Britnell – 2010</i> ○ <i>144 kV Hotchkiss to Wesley Creek – 2010</i> ○ <i>144 kV Rainbow Lake to Ring Creek – 2011</i> ○ <i>144 kV Sulphur Point to High Level – 2011</i> <p><i>Phase 2 of the Northwest Alberta Need Application was approved on October 27, 2006.</i></p>

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	<p>31) CNRL: Will the AESO consider double circuits for the Britnell to Wesley Creek 240 kV line approved in the Northwest Need Application?</p> <p><i>AESO: At this time, a double-circuit option for this line is not being considered by the AESO.</i></p> <p>32) DJ Hammond Consulting Inc.: With respect to the Edmonton Area region, when will the voltage violations manifest in the 10 year period?</p> <p><i>AESO: The 10-Year Transmission System plan is to provide a “road map” of the Alberta Interconnected Electric System in 10 years. For this plan, the AESO considers the system 10 years out and while we may take a cursory look at timing of the violations may be undertaken, a more detailed look at the violations are developed during the need assessment stage of area planning.</i></p> <p>33) ENMAX: ENMAX requests that projects be initiated and timelines constructed to address the concerns. Specific areas of concern for ENMAX are:</p> <ul style="list-style-type: none"> • 936L / 937L overloading and separation of Calgary loads from the Langdon SVC under a Category C contingency involving the common structures for these circuits • Inadequate 240/138 kV transformation at East Calgary Substation and large (0.05 pu) voltage swing at East Calgary Substation with a trip of 917L • Existing and emerging Category B contingency violations involving the 138 kV transmission circuits supplying the Calgary Downtown Core <p>ENMAX recognizes that AESO has initiatives underway to mitigate the above violations (Bulk System Plan and Calgary Business District Study), however, ENMAX believes that it would be beneficial to list these projects as specific areas of study in the 10 Year Plan.</p> <p><i>AESO: As previously stated, the 10-Year Transmission System Plan is intended to be a document that provides a high-level overview of the transmission system in Alberta over the next ten years. The AESO performs detailed analysis mentioned above at the need application stage of specific area projects.</i></p> <p>34) ENMAX: Based on the AESO published 2015 base cases, there are several Category B thermal overloads that have not been listed in Table 15 of Section 5.2.4.</p>

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	<p>Overloads not identified include:</p> <ul style="list-style-type: none"> • 11.83L with a trip of 39.82L • 2.81L with a trip of 24.83L • 23.80L with a trip of 24.83L • 39.82L with a trip of 11.83L • 11.83L with a trip of 22.81L • 11.83L with a trip of Sarcee T1 • 11.83L with a trip of Sarcee T2 <p>Overloads that may have been included in error:</p> <ul style="list-style-type: none"> • 11.81L with a trip of 39.82L <p>Voltage violations not identified:</p> <ul style="list-style-type: none"> • ENMAX 13S • ENMAX 3S • ENMAX 8S • ENMAX 33S • Additional violations occur at several substations with the loss of East Calgary T1, 24.83L, 2.81L, or 30.81L. <p>Please respond.</p> <p><i>AESO: The AESO takes note of this point and will revise the draft report as necessary.</i></p> <p>35) ENMAX: The 936L / 937L path a critical path for loads in the City of Calgary and the bulk transmission system in general. Currently the 936L / 937L path provides the connection between Calgary loads and the Langdon SVC, as well as the connection between the N-S 240 kV system and the Alberta – BC tie. In a post 500 kV transmission system this path will become even more critical as power that is forced on to the 500 kV system will have to travel along this path to reach the major load centers in Calgary via Janet Substation. From Janet Substation power will then need to flow along 917L to reach the other 240/138 kV source substations of East Calgary and Sarcee.</p> <p>Given the criticality of this path in controlling Calgary area voltages and the AESO's</p>

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	<p>intention to use phase shifting transformers to push power on to the 500 kV system, ENMAX would like to see timelines developed for reinforcement these critical transmission paths.</p> <p><i>AESO: As mentioned, the 10-Year Transmission System Plan is a document that provides a "snapshot" or "roadmap" of the Alberta Interconnected Electric System over the next 10 years. Preliminary work is currently underway for the need application stage of this specific project and a stakeholder process will be developed when the preliminary studies are complete.</i></p> <p>36) ENMAX: Similarly, the single 240/138 kV autotransformer at East Calgary is currently supplying a large proportion of load located in the Calgary Downtown Core. Given the rapid load growth that is occurring in Downtown Calgary, ENMAX encourages the AESO to act proactively to ensure that adequate transformation is in place to supply the City of Calgary's needs.</p> <p><i>AESO: Please refer to the above answer. The AESO and ENMAX are presently completing preliminary work for the need application stage of this project.</i></p> <p>37) ENMAX: A north to south voltage gradient exists in the Calgary 138 kV transmission system as voltages get progressively lower as the distance from the 240/138 kV source substations increases. ENMAX has concerns that this voltage gradient will soon exceed the voltage limits set out by AESO OPPs. This concern along with the voltage violations in the High River area point to the need for an additional 240/138 kV source substation and the associated transmission facilities to the south of Calgary. ENMAX encourages the AESO to develop a plan to build a future south Calgary 240/138 kV Substation. Once a plan has been developed ENMAX believes that it would be prudent to acquire transmission right of ways as land in this area is under development.</p> <p><i>AESO: The AESO takes note of this point.</i></p> <p>38) WestWindeau Inc.: Please provide details regarding the thermal limit violations on the South cut-plane under section 4.3.4. Which lines are thermally overloaded? How much wind generation is required to create the thermal violations? Does the location of wind generation change the impact on thermal violations?</p>

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	<p>AESO: <i>These matters will be discussed in the South Region section (5.1) 10-Year Transmission System Plan.</i></p> <p>39) Kennedy & Associates: The constraint on 911L has been known for years. Why is this not shown in the preliminary report?</p> <p>AESO: <i>The Southwest Alberta Need Application was approved in 2004. This transmission development will alleviate the constraint.</i></p> <p>40) WestWindeau Inc.: The AESO is aware through discussions and submissions to the AESO from energy developers in the South of more than 2000 MW of wind projects seeking to interconnect in the Southeast region. Please explain why the generation scenarios for the South region (Table 9) does not include at least one scenario in which there is at least 2000 MW of wind generation interconnection in the Southeast.? The AESO is requested to add a scenario in which there is at least 2000 MW of wind generation in the southeast, report on the areas of concern and the conceptual plans under this scenario. If the AESO is unwilling or unable to conduct such a scenario then it is requested to demonstrate how the proposed conceptual plan will be sufficiently robust to accommodate at least 2000 MW of wind generation in the southeast.</p> <p>AESO: <i>The 3200 MW of wind generation for the high wind scenario was based on the best available information to the AESO at the time that the generation outlook was prepared. If new information is available, it will be examined at the need application stage for the Southeast.</i></p> <p>41) WestWindeau Inc.: Section 5.2.4, Table 15. Under scenario 1a + wind and scenario 2a + wind, the table reads, "The existing transmission system is not capable of accommodating this generation without additional reinforcement from" No such comment is made in relation to Scenario 1a or 2a. Does this mean that the AESO is prepared to operate the transmission system without addressing the thermal limits observed under scenario 1a and 2a? Why is there a specific comment related to the 1a+wind scenario that expresses an inability to operate the transmission system yet no such comment is made for the 1a scenario, even though thermal and voltage limits are present? Is the AESO prepared to leave known thermal and voltage limits unaddressed? Please provide a table of the overloaded elements for each of scenario 1a+wind and 2a +wind.</p>

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	<p><i>AESO: The “not capable” comment refers to the non-convergence of the model which indicates a system collapse. It would require a major reinforcement, possibly 500 kV from the southern region to the Calgary region. This will be further clarified in the next version of the report.</i></p> <p>42) CRD Energy Services: How long can the Edmonton system survive on capacitor banks?</p> <p><i>AESO: Capacitor banks will provide enough VARS to take the system to 2010/11. Beyond this, timing will depend on the system reinforcements that have been built.</i></p> <p>43) CRD Energy Services: In Calgary?</p> <p><i>AESO: The AESO is continuing to assess the viability of additional capacitor support in the Calgary area. However, additional capacitor banks will not address the thermal limitations in the Calgary area.</i></p> <p>44) CRD Energy Services: Will the AIES need the NE upgrade in place by 2010/2011 in order to protect Edmonton? Can you add more Cap Banks?</p> <p><i>AESO: The AESO expects additional reinforcements will be required beyond additional capacitor banks in the Edmonton area by 2010/2011. Reinforcements into the Northeast area are expected to serve the load in the Fort Saskatchewan area and do not assist the Edmonton area issues.</i></p> <p>45) CRD Energy Services: How deep can you go with Cap Banks before you create a brittle system?</p> <p><i>AESO: Other transmission issues may lead to mitigation measures that could improve system stability in without the capacitor banks.</i></p> <p>46) WestWindeau Inc.: At what level does the Janet to Langdon line need to be reinforced again if 3300 MW of wind generation is connected?</p> <p><i>AESO: The AESO will provide a transmission development plan for the area that will be staged in accordance with future load growth in the area.</i></p>

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	<p>47) ENMAX: Has the AESO performed angular stability analysis if 917L tripped – would you get a voltage violation?</p> <p><i>AESO: No, the AESO has not performed the above-mentioned angular stability analysis for the 10-Year Transmission System Plan.</i></p> <p>48) ENMAX: Is a 5% drop in voltage significant?</p> <p><i>AESO: The significance of a 5% drop in voltage depends on criteria and circumstances surrounding it.</i></p> <p>49) ENMAX: Is there a need for a line between ENMAX 47S and 36S?</p> <p><i>AESO: The AESO does not perceive a need for a line at the present time.</i></p>
<p>BULK SYSTEM ISSUES IDENTIFIED</p>	<p>50) WestWindeau Inc.: Will the AESO establish a priority to resolving cut-plane limits based on the cut-planes that see the most violations across all the generation scenarios? How will the AESO establish a priority for resolving the cut-plane limits?</p> <p><i>AESO: The 10-Year Plan will present possible alternatives that will solve all cut-plane issues identified. Detailed solutions, sequence and prioritization will be resolved at the need identification stage of specific area planning accompanied with the associated stakeholder processes.</i></p> <p>51) TransCanada: The preliminary report states “If the oilsands producers add less on-site generation than anticipated, the forecast of south to north capability would exceed 2700 MW.” Does the figure 2700 MW include the entire Northeast area?</p> <p><i>AESO: Yes, it applies to Fort McMurray, Fort Saskatchewan, Athabasca, Cold Lake and the Bulk transmission system.</i></p> <p>52) TransCanada: Is the 2700 MW load assumption based on a probabilistic approach similar to the approach the AESO has taken in the Northeast?</p>

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	<p>AESO: <i>The figure 2700 MW refers to transfer capability not a load assumption. With respect to probabilistic analysis, please refer to the response to question 27.</i></p> <p>53) SNC Lavalin T&D: The presentation illustrates the NE cut-plane loading by 2016. Is this based on an N-1 condition?</p> <p>AESO: <i>The NE path is loaded under normal operating conditions; however the AESO will plan the system to accommodate N-1 contingencies as illustrated in the AESO's Reliability Criteria.</i></p> <p>54) CRD Energy Services: With respect to the SOK cut-plane, and Bow City does not proceed, will any generation in the south help to repair the SOK flow?</p> <p>AESO: <i>Any base-loaded generation in the south area of Alberta will help to restore the flow on the SOK cut-plane.</i></p> <p>55) CRD Energy Services: In the draft report, the Edmonton to Calgary 500 kV line is in place and it still appears the SOK cut-plane has constraints on exports. Will the alternatives developed include a contingency plan if the project is delayed or the Alberta Energy and Utilities Board decision on the need application rescinded?</p> <p>AESO: <i>Yes. There are still constraints on the SOK cut-plane with the Edmonton to Calgary 500 kV line in place. The AESO has developed a preliminary contingency plan if the project is delayed. The development of detailed operational type contingency plans, if this proves to be necessary, will be undertaken in late 2008 or early 2009.</i></p> <p>56) WestWindeau Inc.: What effect will the Southwest reinforcement have on alternatives in the Southeast?</p> <p>AESO: <i>The approved transmission development in Southwest Alberta will have an effect on the alternatives in the Southeast and has been considered in the specific area planning currently underway for Southeast Alberta. Please refer to the draft revision of the Southeast Alberta need assessment and alternative screening document.</i></p> <p>57) WestWindeau Inc.: Will additional VAR supply from Medicine Hat help to restore the</p>

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	<p>intertie to its full path rating?</p> <p><i>AESO: Yes, it would help with respect to the dynamic reactive reserve.</i></p> <p>58) WestWindeau Inc. – Would the Alberta-Saskatchewan Intertie be restored to its full path rating if wind generation in Southeast Alberta can provide additional VARS?</p> <p><i>AESO: No. The proposed Southeast wind generation is located too far away from the facilities themselves and therefore is unable to ship enough VARS to restore the intertie to its full path rating.</i></p> <p>59) WestWindeau Inc: Why in “Layer 1” of SE is there not a proposal to improve 911L to a 240 kV and add a transformer to restore intertie capability?</p> <p><i>AESO: Please refer to the draft revision of the Southeast Alberta need assessment and alternative screening document for explanation of alternatives and preliminary screening of the alternatives for the Southeast Alberta transmission development.</i></p> <p>60) MATL: MATL respectfully asks that the AESO recognize interties as an essential part of the transmission reliability and market functionality, and take definite steps to ensure all ties are maintained to path rating capability.</p> <p><i>AESO: The AESO acknowledges the requirements stated in Section 8(1) (g) of the Transmission Regulation. At this time, the AESO does not have a contractual obligation for firm service from MATL. Currently, the absence of firm service requirements with respect to the MATL project has led the AESO to not see an impact on the Alberta Interconnected Electric System (AIES). Please refer to the answer below.</i></p> <p>61) MATL: “MATL is extremely concerned and formally requests an explanation as to why the AESO is not considering the positive impact of the MATL tie in both its long range plans and in its Southwest and Southeast regional re-enforcement studies. MATL is making significant system improvements for the AIES and these contributions are not being recognized by the AESO for the potential benefits that Alberta can extract from having merchant investment system improvements. Having made significant contribution to the AIES, MATL finds it alarming that the AESO would arbitrarily choose to ignore the new MATL tie interconnection and its potential benefits...”</p>

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	<p>AESO: <i>The AESO acknowledges that MATL may provide potential benefits. However, the MATL tie is a merchant interconnection in which the decisions surrounding whether the project proceeds is in the hands of MATL itself. The AESO would consider it inappropriate and inconsistent with its regulated mandate to provide safe, reliable and economic service to Albertan's, to be relying on a project that may or may not proceed based on the merchant developer's business interests. At the present time, there has not been a request or commitment to the AESO for firm service from MATL and therefore it would be inappropriate for the AESO to plan the transmission system and rely on the MATL tie as suggested.</i></p> <p>62) Kennedy & Associates: Why is the MATL line not shown in the report?</p> <p>AESO: <i>Please refer to the response to questions 60 and 61. The AESO will include a discussion of the treatment of the MATL line in the 10-Year Plan.</i></p> <p>63) SNC Lavalin T&D: With respect to the SOK cut-plane, has the impact of the MATL project been considered?</p> <p>AESO: <i>MATL has been considered in the report and has no influence on maximum export capability. MATL is a merchant project and the AESO has a regulated mandate to plan the system within Alberta. Please refer to the response to question 60 and 61.</i></p> <p>64) CRD Energy Services: Define regulated tie.</p> <p>AESO: <i>The term "regulated tie" has generally been used to refer to an interconnection to a neighbouring jurisdiction in which the capital costs form part of a Transmission Facility Owner's (TFO's) rate base and costs are recovered through the AESO's System Access Service Tariff. Those facilities are available to the AESO to provide system access service to AESO customers. Two examples of regulated ties that exist today include the 500 kV Intertie from Langdon to Cranbrook and the McNeil Intertie to Saskatchewan.</i></p> <p>65) SNC Lavalin T&D: What is the anticipated timeline for another regulated intertie?</p> <p>AESO: <i>The AESO is currently in the early stages of developing a preliminary assessment with respect</i></p>

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	<p><i>to the need of another regulated intertie, recognizing that there may be potential benefits and advantages warranting the development of such an intertie to the AESO's customers. The AESO expects to be in a position to engage stakeholders in discussion in the first or second quarter of 2007 based on that preliminary assessment. Please take note the AESO is not in competition with merchant intertie development. If a merchant developer wishes to build such an interconnection with another jurisdiction, the development of a regulated intertie may be affected.</i></p> <p>66) CRD Energy Services: Does the AESO envision a regulated intertie within the next 10 years?</p> <p><i>AESO: Please refer to the response to question 65.</i></p> <p>67) WestWindeau Inc.: Section 5.6.4.2 mentions the possibility of a 500 kV line from Fort McMurray to the NE region (Wesley Creek 834S) and on to the Peace River dams in BC. The possibility of a second inter-tie with BC has implications that are far broader than the NW and NE region. The AESO is therefore requested to provide full disclosure on its plans for a second BC inter-tie and a full discussion of the impact such will have on the transmission system.</p> <p><i>AESO: Please refer to the response to question 65.</i></p> <p>68) WestWindeau Inc.: Additionally, it is requested the 10 Year Plan include a separate section that is focused directly on the potential inter-tie upgrades or additions including the options for a second A/BC tie, the options for a second A/Sk tie and the impact of MATL as well as any further inter-ties with the US grid, such a Northern-Lights. Given the importance of the 10 Year Plan in orientating all stakeholders to the potential transmission developments in the next 10 years it is imperative that stakeholders be provided full transparency to such plans. Finally, the scenarios lack any consideration of the impact and influence of external markets. Clearly, different levels of imports and exports will affect the willingness (or not) to build generation facilities in Alberta and to this extent the transmission reinforcement scenarios underpinning the 10-Year Plan should examine the impact of varying levels of inter-jurisdictional transfers.</p> <p><i>AESO: This 10-Year Transmission System Plan provides a preliminary review of an evaluation for new interconnection options. The AESO plans to make a more thorough evaluation of additional</i></p>

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	<p><i>interconnections during 2007. This will involve working with Alberta stakeholders and BCTC to more carefully identify possibilities for increasing export and import capability.</i></p> <p>69) WestWindeau Inc.: Is there a stakeholder consultation process with respect to another regulated tie?</p> <p><i>AESO: Please refer to the response to question 68.</i></p> <p>70) WestWindeau Inc.: Section 4.3.5 discusses the A/BC inter-tie and path limit. The text states the limit at 800 MW (735 after TRM deduction), Figure 8 states the path limit at 700 MW; which is it? The A/BC inter-tie is further limited for operational reasons. To avoid confusion it is requested that the AESO provide further details to explain the operational limits of the tie and how this compares to the planning limits.</p> <p><i>AESO: The path limit of the Alberta/BC intertie is now 800 MW. The planning limits are consistent with the operating limits.</i></p> <p>71) WestWindeau Inc.: Section 4.3.6: Please provide the A/Sk inter-tie path limit for exports. Figure 8 suggests it is 150 MW but the tie has not been operated at this level for several years. The regional section identifies a limit of 60 MW. Please clarify.</p> <p><i>AESO: The current Alberta/Saskatchewan import/export limits are 153 MW/60 MW.</i></p> <p>72) WestWindeau Inc.: In the preliminary report, the Alberta-Saskatchewan intertie is rated for 150 MW however, due to local constraints; it is only rated at 60 MW. Please respond.</p> <p><i>AESO: Please refer to the response to question 71.</i></p> <p>73) WestWindeau Inc.: Section 4.5.1.3 and 4.5.1.5. Please provide a discussion of the incremental impact on the SOK cut-plane limit and the Path 1 (A/BC Inter-tie) limit due to southern generation. For example, does the limit increase by 1 MW for each 1 MW of Southern generation. Describe whether the incremental impact is different at different set points and different generation sources, i.e. what factors affect the impact? Please provide this information in graphical or tabular form showing the impact at various</p>

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	<p>ranges of southern generation and path loading.</p> <p><i>AESO: As a general rule, each 1 MW of southern generation will reduce SOK loading by 1 MW. South-eastern generation will be slightly less effective than generation located closer to Calgary.</i></p> <p>74) WestWindeau Inc.: Section 4.5.1.5 estimates the level of export constrained off if the path limit of 700 MW is not increased. Please explain whether the AESO has undertaken a detailed analysis of export markets and is forecasting the economically viable level of exports relative to the price of energy in Alberta? If the AESO has not conducted an economic study of export market please explain how the AESO has derived an estimate of curtailed exports; please show all assumptions.</p> <p><i>AESO: The AESO has not performed an economic study of market conditions. Exports were estimated using a generation 'stack' based on expected generator price. When generation was available above a predetermined price point than exports were assumed to occur until generation costs rose to the price point or the export limit was reached. The AESO is not prepared to release any of these modelling details.</i></p> <p>75) WestWindeau Inc. Section 4.5.1.5. Please provide further clarification on the increase in the A/BC path rating from 700 to 1000 based on "work underway". What is the "work underway"? Is it different than the N-S 500 kV upgrade? Even with the 500 kV upgrade, is it not the case that A/BC transfers will be limited by post-contingency frequency violations? Please explain why the reasons that limit the A/BC tie to 700 MW will be removed when the 500kV is installed and operational (or the "work underway" is complete)?</p> <p><i>AESO: There are several initiatives underway and a number of departments at the AESO are pursuing to increase this export capability. These efforts include system improvements, operating policy modifications, initiatives with Alberta generators and BCTC and Long-Term adequacy. Please refer to the response to question 68.</i></p>
<p>POSSIBLE ALTERNATIVE RECOMMENDATIONS</p>	<p>76) CNRL: The Edmonton-Calgary 500 kV is scheduled to be in service in 2010 and at capacity in 2016. Will the AESO consider double circuits?</p>

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	<p>AESO: <i>No. It is not practical or economic to build double circuit towers for 500 kV primarily due to reliability concerns of putting two 500 kV transmission lines on double-circuit towers for the entire length of the circuits. However, a second Edmonton to Calgary 500 kV transmission development will be included in the 10-Year Transmission System Plan (2007-2016).</i></p> <p>77) CNRL: A DeWinton substation was proposed in 2000/2001 to resolve overloads in Janet. Is this still proceeding?</p> <p>AESO: <i>No, not at this time The AESO anticipates this may be required within 20 years. Please refer to the 20-Year Transmission System Outlook (2005-2024).</i></p> <p>78) CNRL: With respect to islanding the Northeast for C5 events, would this include only the 240 kV system or would the 138/144 kV lines need to be cut as well?</p> <p>AESO: <i>Category C events have not been studied for the purposes of the 10-Year Transmission System plan. Category C and D events will be studied as part of the detailed need application stage of the transmission planning process.</i></p>