ADC.AESO-001

Request: Please explain why the 500 kV N-S Need Application did not consider data for lines in other areas.

Response: The 500 kV N-S Need Application was focused on the transfer capability of the North-South transmission system, including the transmission system in the Lake Wabamun area, the Edmonton to Calgary transmission path, and the transmission path to the Fort McMurray area. It therefore did not examine the bulk transmission system in other areas of the province.

ADC.AESO-002

Request: Please provide a complete copy of the Need Application for the 500 kV N-S line.

Response: The Need Application is available on the AESO website at www.aeso.ca by following the path Transmission > Need Applications > Approved > Edmonton-Calgary 500 kV Transmission Development.

ADC.AESO-003

Request: Please provide all studies supporting the contention that the transmission system is not constrained in the winter time.

Response: The Preliminary Report does not contend that there are no constraints in the wintertime. As summarized in the table on pages 7-8 of the Preliminary Report, some areas of the transmission system **are** constrained in the winter time. For example, the northwest part of the province is constrained in the winter time as shown in the Need Application for the Northwest Alberta Transmission Development (available on the AESO website at www.aeso.ca by following the path Transmission > Planning > Consultations > Northwest Alberta Transmission Development). Other areas of the transmission system are constrained at times other than the winter. For example, please refer to the Need Application in Request 2 above as an example of a constraint that does not occur in the winter time.

ADC.AESO-004

Request: Is the term “maximum stress” synonymous with “maximum load” or is there another definition for the term “maximum stress?” If another definition is being used, please provide the metrics examined to determine when a line experiences “maximum stress.”

Response: No, the term maximum stress is not synonymous with maximum load. Maximum stress is the situation where planning criteria are in violation, and system upgrades are required to alleviate the stress on the system. Maximum stress occurs when planning criteria are most severely violated. Maximum stress may result from limits of thermal capacity, voltage, or stability. For example, thermal capacity is easiest to demonstrate as follows: A line has a thermal rating of 500 MVA in the winter, and 400 MVA in the summer. If the line is loaded at 400 MVA for the entire year, the line is at 80% of its thermal capacity in the winter and is at 100% of its thermal capacity in the summer. This line experiences maximum stress in the summer even though its load is constant throughout the year. The system may also experience maximum stress through voltage or stability concerns.

Maximum stress typically occurs when transmission system components are heavily loaded, and as shown in the Preliminary Report, there is generally poor correlation between the total system load and the loading on transmission system components. In fact, some transmission system components exhibit a negative correlation between total system load and loading on transmission system components.

ADC.AESO-005 (a-d)

Request: For each of the paths listed in the tables on pages 7-8 of the preliminary report, please provide the following information:

(a) The thermal capacity and voltage of the line(s) crossing the cut plane;

(b) The total length of the transmission lines that cross that cut plane; and

(c) The date of the last reinforcement for construction along the path; and

(d) If known, the justification for the last reinforcement along with any supporting studies or analyses.

Response: (a-d) The Tables on pages 7 and 8 were a qualitative assessment describing a path, the constraint, and the cause of the constraining factor. The following description is found at the bottom of page 8:

> This qualitative assessment shows that transmission planning is very complex and is not dominated by any one simple factor such as peak AIS load. Transmission planning is driven by a large number of independent factors such as generation patterns for each generating plant, total load over large areas of the province, thermal capacities of electrical equipment in both summer and winter, etc.

Since the tables on page 7 and 8 were a qualitative assessment, the requested quantitative data has not been compiled, and was not used in preparing the Preliminary Report.

ADC.AESO-006 (a-d)

Request: For each hour in 2005, please provide in electronic format:

(a) The total load (including exports) on the Southern Alberta system;

(b) The total load (including exports) on the Central Alberta system;

(c) The total load (including exports) on the Northern Alberta system; and

(d) The total export load.

Response: (a-d) The total Alberta load by hour for 2005 is included in the file provided in response to Request 9(b). The file is available on the AESO website; please refer to the response to Request 9(b) for the location of the file and for additional information.

Please note that load broken out as requested has not been compiled, and was not used in preparing the Preliminary Report.

ADC.AESO-007 (a-d)

Request: For each hour in 2003, please provide:

(a) The total load (including exports) on the Southern Alberta system;

(b) The total load (including exports) on the Central Alberta system;

(c) The total load (including exports) on the Northern Alberta system; and

(d) The total exports.

Response: (a-d) The total Alberta load by hour for 2003 is included in the file provided in response to Request 9(b). The file is available on the AESO website; please refer to the response to Request 9(b) for the location of the file and for additional information.

Please note that load broken out as requested has not been compiled, and was not used in preparing the Preliminary Report.

ADC.AESO-008

Request: For each of the paths for transmission lines listed in the table on pages 7-8 of the preliminary report, please provide the hours in which the AESO requested redispatch for reasons of an N-1 contingency.

Response: Please note that the tables on page 7 and 8 provide a qualitative assessment, not quantitative data. However, in general generation units are not redispatched for reasons of an N-1 contingency. The transmission system is designed to withstand a single contingency without loss of load. Generally, when there is no loss of load, there is no dispatch down of generation. Since the system is designed to withstand a single contingency, there is normally no redispatch of generation for a single transmission contingency.

ADC.AESO-009 (a-e)

Request: Please provide, in electronic form, separately for each of 88 240 kV circuits the following data:

(a) The hourly metered data for 2003;

(b) The hourly metered data for 2005;

(c) The primary source and sink (e.g., for the 920L circuit the source would be Edmonton and the sink would be Fort Saskatchewan);

(d) The circuit's thermal rating; and

(e) The hours during 2003 and 2005 when redispatch directions or TMR were required to respond to an N-1 contingency.

Response: (a) Hourly data by circuit for 2003 has not been compiled, and was not used in preparing the Preliminary Report.

(b) A file containing hourly data by circuit for 2005 as used for the Preliminary Report has been posted on the AESO website at www.aeso.ca. The file is titled "2006-05-18 AESO 2006 CCS Preliminary Report - AESO Response Attachments" and is available by following the path Tariff > Current Consultations > 2007 Rates > AESO 2006 Cost Causation Study. The file is larger than can be easily distributed by e-mail, and may be downloaded from the location indicated. If a stakeholder is unable to download the file, please contact Maureen Winslow by e-mail to maureen.winslow@aeso.ca or by phone at (403) 539-2463 in Calgary to arrange for a CD containing the file.

Further examination of the data identified seven circuits which had been included twice in the data set (once for each meter at either end of the line). The duplicate data has been removed from the file. The conclusions based on the Preliminary Report are not expected to be affected by the duplicate circuits. The final report for the 2006 Cost Causation Study will exclude the duplicates from the analysis.

As well, please note that five of the 88 240 kV circuits examined for the Preliminary Report have not been included in the file, where the circuits connected a single generator or otherwise could be considered to provide confidential information about the operation of a single customer. The data set posted on the AESO website includes data for 76 circuits.

Finally, the circuit data was collected from SCADA meters used for operation and control of the transmission system, and is not data from revenue meters. Occasional gaps, errors, or excursions are present in the

data, but are not expected to influence the conclusions drawn from examining the data.

(c) In the AESO's experience, the terms "source" and "sink" are generally used in power system load flow analysis, where "sources" are generators and "sinks" are loads. The AESO does not identify the "primary source and sink" for a transmission circuit, although generalizations could be made based on the location of a circuit within the transmission system. As noted in the response to Request 12, flows can occur in both directions on a line. When analyzing data for the lines, the highest values were deemed to be positive.

(d) Line ratings, in MVA at 240 kV, are included in the file discussed in (b) above. Where a circuit comprises multiple segments, the value reported is the lowest capacity for any segment of the circuit. Values given are the effective line rating, not the thermal rating: lines may be limited, for example, by CT ratios, other terminal equipment, underbuild and clearances, and so on. The value provided is the actual effective capacity.

(e) As explained in (a) above, 2003 data has not been compiled, and was not used in preparing the Preliminary Report.

As explained in the response to Request 8, there is normally no redispatch of generation for a single transmission contingency.

ADC.AESO-010

Request: Please provide a transmission level one-line diagram or map showing each of the cut planes listed on pages 7-8 along with the boundaries of the Southern AIS, Central AIS and Northern AIS systems.

Response: Please refer to the Need Applications discussed in responses to Request 2 and Request 3 for diagrams and maps, as well as other Need Application documentation available on the AESO website at www.aeso.ca by following the paths Transmission > Need Applications and Transmission > Planning > Consultations.

ADC.AESO-011

Request: For the 26 circuits that exhibited negative correlation, please provide:

(a) The Need Application; and

(b) The total cost of the circuit.

Response: (a) The circuits in question were built by vertically-integrated utilities before deregulation and predate the current form of the Need Application.

(b) The 26 circuits exhibiting a negative correlation to AIL load comprise 19% of the total net book value of the 88 circuits that were studied ($52 million of $269 million). Note that the cost analysis in the Transmission Cost Causation Study was based on net book value, which is an appropriate approach when examining the bulk system as a whole. However, the net book value of individual circuits or of only some circuits may not provide results comparable to the net book value of all circuits in the bulk system, due to variations of age and other factors for individual circuits.

ADC.AESO-012

Request: With reference to the 997L circuit (Figure 4, page 12, of the Preliminary Report) and the 917L circuit (Figure 5, page 13), there appears to be data points with negative load. Please explain the significance of this.

Response: Negative load indicates that the flow of electricity has reversed on the line.

ADC.AESO-013

Request: Please provide the annual revenue requirement of the Atco Electric circuits in totality.

Response: The most recently approved annual revenue requirement for ATCO Electric TFO is $158.5 million. This amount consists of $166.4 million approved in EUB Decision 2005-133 dated December 13, 2005 on ATCO Electric's 2006 Interim TFO Tariff, less $7.9 million credit for isolated generation approved in EUB Decision 2006-024 dated March 17, 2006 on ATCO Electric's 2005-2006 GTA.

ADC.AESO-014

Request: Please provide the annual revenue requirement of the AltaLink circuits in totality.

Response: The most recently approved annual revenue requirement for AltaLink is $193.7 million, approved in EUB Decision 2005-082 dated July 28, 2005 on AltaLink's and TransAlta's 2004-2006 TFO Tariff.

ADC.AESO-015

Request: Why did the KEG path include imports and not exports? Please explain how this was done.

Response: The N-S Need Application was a future-looking application, and the relevant lines were modeled to allow assessment of future flows. The premise for the model was that the system was not designed to export energy from Alberta during peak load periods. Since that time, the Transmission Regulation has come into effect and requires that the transmission system be robust enough to export energy. Regarding imports, the interprovincial interties were constructed on the basis that imports would be available to assist Alberta at the time of peak load, and this is why imports were included.

The data used in the preparation of the Preliminary Report represents actual line loading during 2005, and specific components (such as imports and exports) cannot be separately identified and excluded.

ADC.AESO-016

Request: Please provide the data points in Figure 6 and explain how the 2007 data points were estimated.

Response: Please refer to the N-S Need Application as discussed in response to Request 2.

ADC.AESO-017

Request: On page 15, please provide the number of lines which are near their peak load during the hour of the annual AIL peak.

Response: If one defines “near their peak load” as 90% or more of their annual peak load, then 3 out of 88 circuits would be near their peak load at the hour of the annual AIL peak load. During the hour of annual AIL peak load, the transmission lines in aggregate were loaded at 59% of their aggregate annual peak loads.