

Reference: Based on metered data for the 8,760 hours in 2005, the load over all seventy-nine 240 kV bulk transmission lines in Alberta (weighted by line length) showed only an 8% correlation with AIL. In response to concerns about basing material conclusions on a single year's data, the analysis was repeated using metered data for the 8,760 hours in 2004, resulting in bulk line load showing a somewhat lower 1% correlation with AIL.

Additional weighted and unweighted analysis incorporating net book value and percentage of thermal line rating provided correlations from -3% to +18% for 2005 data, and from -3% to +11% for 2004 data. Detailed review of the line data also showed that:

- None of the 240 kV lines experienced their monthly peaks during the times of AIL monthly peaks.
- During the hour of annual AIL peak, lines were loaded at about 60% of their annual peak load on average.
- During the hour of annual AIL peak in 2005, only four of the seventy-nine 240 kV lines were loaded at 90% or more of their annual peak. In 2004, only five of the lines were loaded at 90% or more.

(Section 4, Page 8)

Request:

- (a) Please provide the hourly data referred to (2006-07-20_AESO_2006_Cost_Causation_Update_-_2005_Meter_Data.xls) as part of the record of this proceeding.
- (b) Please explain why the above passage refers to 79 lines when the Excel spreadsheet provided (2006-07-20_AESO_2006_Cost_Causation_Update_-_2005_Meter_Data.xls) includes data for only 75 lines.
- (c) Please provide all data for all excluded lines.
- (d) For each of the 79 lines, please provide the line number, describe the termination points, describe the location of the metering point and indicate the direction of flow for positive and negative metered values.
- (e) Please correlate each of the 79 lines with the transmission paths identified in the draft 10-year plan (10-year Transmission System Plan 2007-2016, dated October 30, 2006, Figures 3 and 4 and Section 4).
- (f) Where a number of 240 kV lines are included in a transmission path, please indicate by transmission path if the path flows of the 240 kV lines can be added directly or if the sign convention adopted requires that some values be inverted (i.e. multiplied by -1) to derive the path flows.

- (g) For each transmission path indicated in the ten-year plan, please indicate the lines for which flow data is not provided. Please also describe the basis for excluding these lines (i.e. not 240 kV, not significant proportion of the path flow, etc.).
- (h) Please explain why the AESO did not combine the lines into transmission paths prior to conducting the analysis described in the reference to this question. Please discuss whether the conclusions of the analysis may be different if the analysis focused on path flows rather than individual lines. Please provide a full explanation.
- (i) Please provide a spreadsheet that includes the hourly data for each path identified in the 10-year plan.
- (j) Please provide graphs as in Appendix D representing the flows on the paths identified in the 10-year plan rather than the 79 lines presented by the AESO in the application.
- (k) Please confirm that in calculating correlation coefficients between line loadings and AIL load, all hours are considered, not merely those hours that are likely to relate to cost causation. If this cannot be confirmed, please explain.

Response:

Revisions to parts (d) and (e) indicated in italics.

- (a) The hourly metered data was posted on the AESO website shortly after the filing on December 13, 2006 of the additional analysis of bulk system data provided as Appendix D to the AESO's 2007 GTA. The data, in two large Excel workbooks, is available on www.aeso.ca by following the path Tariff > Current Applications > 2007 Tariff Application > Additional Information. If a stakeholder is unable to access the workbooks from the AESO website, please contact April Walters at (403) 539-2463 to arrange for a CD containing the workbooks.
- (b-c) As noted in the Excel workbooks referred to in part (a) above, data for five of the seventy-nine 240 kV lines examined for the *2006 Transmission Cost Causation Update* was excluded from the workbooks, where those lines connected a single customer or otherwise could be considered to provide confidential information about the operation of a single customer. The Excel workbooks therefore contain data for seventy-four 240 kV lines.

One of the 75 metering points included in the original 2005 data file posted by the AESO on July 20, 2006, did not relate to a 240 kV line, and has therefore been removed from the final Excel workbooks referred to in part (a) above.
- (d) The line number identifiers are included in the Excel workbooks referred to in part (a) above.

The specific terminal points for the seventy-four 240 kV lines referred to in part (a) above are provided in attached Schedule IPCAA.AESO-009 (d) Revised. All but two terminal points are at substations, with the metering point located where the line interconnects to the bus within each substation. The "destination" terminal points for 927L and 935L are connections to other lines; there are no meters at those points.

The bulk system analysis in the 2006 Transmission Cost Causation Update used data from meters at the “origin” terminal points. Positive meter values indicate flow from the “origin” terminal point to the “destination” terminal point.

- (e) The bulk transmission lines associated with the cut-planes and bulk system conceptual transmission projects identified in the 10-Year Plan are as follows. (Page number references are to the January 2007 version of the 10-Year Plan filed by the AESO as Attachment EnCana.AESO-004 (a) Revised on February 5, 2007.)

Figure 3: Bulk system cut-planes and transmission areas (p 40):

- Northwest (NW cut-plane): 913L, 919L, 989L
- Northeast (NE cut-plane): 920L, 921L
- SOK (South of KEG (Keephills-Ellerslie-Genesee) cut-plane): 190L, 903L, 910L, 914L, 922L, 926L
- South (South cut-plane): 911L, 924L, 927L, 9L59
- Path 1 (AB-BC inter-tie): 1201L (500 kV), 786 L (138 kV), 887L (138 kV)
- Path 2 (AB-SK inter-tie): 830L (138 kV)

Figure 4: The five bulk system areas — 2016, scenario “1a” (p 41) (inter-regional connections not shown in Figure 3):

- Northwest-Northeast inter-regional connection: 9L57

Table 12: Bulk system transmission projects underway or expected (p 44):

- Add capacitors: no specific lines but associated with SOK cut-plane; intra-Edmonton region
- KEG conversion (Table 12): 1203L, 1209L; not part of but associated with SOK cut-plane; intra-Edmonton region
- New Edmonton-Calgary 500 kV line: 190L, 903L, 910L, 914L, 922L, 926L; SOK cut-plane

Table 13: Bulk system conceptual transmission projects by 2016 required for all scenarios (p 52):

- Second Edmonton-Calgary 500 kV line: 190L, 903L, 910L, 914L, 922L, 926L; SOK cut-plane
- New 240 kV double circuit replacing 911L: 911L, 924L, 927L, 9L59; South cut-plane
- 946L/947L split: 946L; not part of but associated with NE cut-plane; intra-Edmonton region

Table 14: Northeast cut-plane conceptual transmission projects by 2016 required for some additional scenarios (p 53):

- New 500 kV Keehills-Heartland line: 920L, 921L; NE cut-plane
- New Heartland substation and 500 kV lines: 920L, 921L; NE cut-plane
- New 240 kV Brintnell-Dover line: 9L57; NW-NE inter-regional connection
- New 500 kV Brintnell substation and Heartland-Brintnell line: not part of but associated with Northeast cut-plane; intra-Northeast region

Table 15: South cut-plane conceptual transmission projects by 2016 required for some additional scenarios (p 53):

- 933L in-out at Ware Junction: 933L; not part of but associated with South cut-plane; intra-South region

- *New 240 kV Ware Junction-Langdon line: 911L, 924L, 927L, 9L59; South cut-plane*
 - *New Crowsnest substation and 240 kV double circuit: 911L, 924L, 927L, 9L59; South cut-plane*
- (f) Where there are parallel lines, the loads on the lines can be added to determine the total flow.
- (g) Please refer to part (e) above.
- (h) The purpose of the *2006 Transmission Cost Causation Update* was to review cost causation, and usage of the system. While transmission planners may view path flows to understand trends of energy moving from one area to another, the transmission system is ultimately planned and built one line at a time. Also, meter data is available on a line by line basis. Therefore, the *Update* considered usage on the system line by line, rather than various combinations of lines.
- (i) Please refer to part (e) above.
- (j) Please refer to part (e) above.
- (k) Confirmed.