Below, AESO is responding to questions posed by Maxim on April 22 2005. AESO's responses are in bold and the questions have been renumbered.

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Maxim Question Paper 1.

Comments on Transmission Loss Factor Methodology – Transition Proposal

The AESO has indicated,

"The transition plan to be successful must balance the wishes of those parties desiring a transition plan and those parties paying the transition costs. The AESO believes that the transition period must be short and is recommending two years."

Questions:

Q1. Is it the AESO's proposal that the transition costs would be borne by all parties equally or is the AESO proposing that the transition costs would be borne by only some of the generators?

A1. The transition proposal as proposed by AESO on May 2 2005 provided a transition for those owners of generation seeing an increase in loss factors from 2005 to 2006. The costs associated with the program would be borne by all participants through the Calibration Factor.

Q2. In the absence of a transition plan are not all of the transition costs borne by those whose loss factors are forecast to increase from 2005 to 2006?

A2. With no transition plan, owners of generation will be responsible to pay their own loss factors which reflect their individual impacts on system average losses.

Q3. Can the AESO explain the rationale or reasons why the transition period "must be short" and why the AESO is recommending two years.

A3. AESO is recommending a short transition to reduce costs for those paying for the transition. The costs rise dramatically for transitions greater than 2 years.

Q4. Would a three year rather than two year transition period contravene the transmission regulation?

A4. The 2004 Transmission Regulation does not mention a transition period.

Q5. Would a three year transition period provide for greater rate stability than a two year transition period?

Q5. AESO is not sure what context of rate stability is being alluded to in the question. The transition period was envisioned as a mechanism to assist owners with loss factors higher in 2006 than 2005.

The AESO has also indicated,

"The second condition was that the transitioned loss factors for 2006 must as a minimum comply with the loss factor boundary defined in Section 19(2)(f). Any generating units
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with loss factors residing outside of the loss factor envelope would be clipped to conform to the boundaries."

Questions:

Q6. Is it the intention to calculate the generator loss factors for 2006 and 2007 based on the proposed transition and then apply clipping to the resulting loss factors or is the AESO proposing that the loss factor for 2007 be based on the difference between the clipped 2006 loss factors and the proposed final 2008 loss factors?
A6. Yes, the difference between the clipped 2006 and the 2007 forecasted would be calculated and halved for 2007.

The AESO has indicated,

"All generating units whose current (2005) loss factors are less than the 2006 proposed loss factor will have their loss factors transition two thirds of the difference towards the 2006 loss factors in 2006 (unless clipping is required to meet the requirements of Section 19(2)(f)), transition half the remaining difference in 2007 and will be assigned their actual loss factors in 2008."

Questions:

Q7. Can the AESO explain the rationale or reasons for proposing to transition two thirds of the difference between the 2005 and 2006 loss factors in the first year and one sixth of the difference in the second year?
A7. The AESO was trying to minimize the number of generating units requiring clipping since it would result in a different treatment between generating units.
Q8. Can the AESO please calculate the estimated transition costs by year in $ and as a percentage of total transmission losses costs if the loss factors were transitioned evenly between 2006 and 2008? This would mean that loss factors would transition one third of the difference between the 2005 and 2006 loss factors in each of 2005 to 2006 and 2006 to 2007 and 2007 to 2008. Can the AESO calculate the generator loss factors for 2006 and 2007 based on the proposed transition and then apply clipping to the resulting loss factors.
A8. If there is sufficient stakeholder support for a transition program, the AESO will undertake to provide you with this option.

The AESO has indicated,

"The forecasted total cost of transmission losses for 2006, as stated in the AESO's recent GTA filing, is $131,000,000. For the purpose of this proposal the AESO has assumed that the 2007 cost for transmission losses will be the same as 2006. The AESO estimate of the transition costs are as follows:

- Total cost increase for losses to the generating units whose loss factors will increase in charges is estimated to be approximately $12 million,

- Year one (2006) costs of the transition proposal is 1/3 x $12 million = $4 million which is approximately 5% of the total forecasted cost of losses for 2006,
- Year two (2007) cost of the transition program is 1/6 x $12 million = $2 million which is approximately 2.5% of the total assumed cost of losses for 2007, and
- Total transition costs shared through Calibration Factor = approximately $6 million over two years.

Questions:

Q9. Can the AESO please provide the Pool Price forecast used to estimate the costs given above?

A9. The pool price was used from the 2006 AESO GTA submission as is $41.20.

Q10. Can the AESO please provide the forecast of Transmission Loss volumes in GWh for 2006 and 2007 used in the above calculations.

A10. The 2006 loss volumes were forecasted to be 3.18 TW.hrs and the 2007 loss volumes were assumed to also be 3.18 TW.hrs.

Q11. Can the AESO confirm that the $4 million estimated transition costs in year one represents 3% of the total cost of $131 million rather than the 5% indicated?

A11. Yes, 3% is the correct answer for the numbers used which were indicative numbers only. Please note the updated numbers supplied on April 12, 2005.

Q12. Can the AESO confirm that the $4 million estimated transition costs in year one represents a calibration factor of approximately 4.8% x 3% = 0.14%?

A12. The AESO has not completed the calibration factor calculation yet but will send it to stakeholders in May 2005. The Calibration Factor will be a % of the Pool Price; therefore we are not certain of the value of your number.

Q13. Can the AESO confirm that the $2 million estimated transition costs in year two represents 1.5% of the total cost of $131 million rather than the 2.5% indicated?

A13. Yes, 1.5% is the correct answer for the numbers used which were indicative numbers only. Please note the updated numbers supplied on April 12, 2005.

Q14. Can the AESO confirm that the $2 million estimated transition costs in year one represents a calibration factor of approximately 4.8% x 1.5% = 0.07%?

A14. See answer to question # A12.

Q15. Can the AESO confirm that a portion of the transition costs shared through the calibration factor will be borne by those generators whose loss factors are subject to transition?

A15. Yes.

Q16. At the April 12, stakeholder meeting, the AESO was asked to calculate the transition costs by year of the proposal submitted by Milner. To stay within the boundaries of the loss factor envelope described in the Transmission Regulation, the AESO was asked to apply clipping after the loss factors are calculated for 2006, 2007, and 2008. Could the AESO provide the results of this analysis to the loss factor stakeholders?

A16. Results were provided in the spreadsheets supplied to stakeholders on April 28, 2005.

Maxim Question Paper 2.

Comments on the Transmission Loss Factor Methodology and Assumptions Appendix 7

The Transmission Loss Factor Methodology and Assumptions Appendix 7 recently provided by the AESO indicates,

"Generating units will be modeled in the twelve base cases using the following criteria:

- Adjustments are made to the historical power generation output if necessary to reduce imports and exports set to zero using a generic stacking order for generation;
- Generating units not represented in the 'historical' load flow model but which would be in merit according to the stacking order will be assumed to be on maintenance or forced outage;
- Generating units modeled in the load flow but not in merit according to the historical stacking order will be assumed to be generating according to market conditions, and will continue to be operated at their base case values; and
- Other generation will be added or removed to reduce exports to zero according to stacking order but recognizing any constraints imposed by the transmission system."

At the last stakeholder meeting there was extended debate over the above text. As described, the raw loss factor for each generator will be determined based on the generator output that is observed in a snapshot of the system. At this moment in time, regardless of the stacking order, if a generator happens to be off line due for whatever reason, its raw loss factor would be based on an output of 0 MW. For this generator, the loss factor would be based on the first MW in rather the last MW. For large generators or generators that are remotely located this could have a significant effect on the loss factor. Since generator outages are often unplanned, the generation modelling described would result in unpredictable and random changes to the loss factors assigned to generators.

Q 17. If the described modelling of the generator dispatch is not what is intended by the AESO can the AESO revise the text given above to clearly indicate how generators will be dispatched in the load flow cases used to determine the raw loss factors? Please include a description of how the generator stacking order will be determined.
A17. Please refer to section 3.1 of the new AESO Rule on Loss Factors.

Q18. To provide clarity, can the AESO provide a spreadhseet showing the generation that was dispatched in the load flow cases used to determine the preliminary loss factors for 2006. Please provide a table showing, by generator, the MW dispatch for each of the 12 base cases used by the AESO to determine the preliminary loss factors for 2006.
A18. The loss factor estimates for 2006 were run with power flow cases populated with the confidential 2005 values, and as such, are not released by the AESO.

On page four of the Transmission Loss Factor Methodology and Assumptions Appendix 7, the AESO indicates,

"'Raw loss factors' calculated in this manner for every generating unit (or equivalent generating unit):

- when multiplied by the generating unit output in MW and summed for all generating units in Alberta will account for almost 100% of the load flow losses for the Alberta system;
- result in a shift factor, required to compensate for over or unassigned losses, which is extremely small;"

Q18. Please define what constitutes "extremely" small as it applies to shift factors.
A18. Much less than 1%.

On page 7 of the Transmission Loss Factor Methodology and Assumptions Appendix 7, under section 3.1 Development of Base Cases, the AESO states,

" In order to meet AESO's requirement for 12 base cases to arrive at the 2006 loss factors, the duration curve (Load Duration or Generation Supply) are needed to be divided into three representative segments. These three segments are – High, Medium and Low."

The AESO then describes a methodology to divide load duration curves and generation supply curves for each season into three representative segments.

It is clear that the AESO's methodology can be applied to the load duration curves to determine appropriate load levels for the 12 base cases. However, it is unclear how dividing the generation duration curves into three segments in each season is to be used.

Dividing the generation duration curves into separate segments yields no information about the stacking order of generation. Further, there is no assurance that the hours when the load was the highest correspond to the hours when individual generator outputs are highest.

When a load duration curve is constructed, the actual hours corresponding to the load in each of the three segments can be tagged. The generation volumes from each generator during the hours included in each of the three segments can then be determined. These volumes can be multiplied by the corresponding generator loss factors and summed to arrive at total forecast transmission losses recovered from generators. In this approach, there is no apparent need to divide the generator supply curves into three representative segments.

Q19. Can the AESO clearly explain the need to divide the generator supply curves into three representative segments and can the AESO clearly explain how the stacking order will be determined in each season?

A19. The generator supply curves are divided in high, median and low load cases to match with the load supply curve segmentation. This is required to provide the twelve load flow base cases and to ensure that the generating unit outputs match the load for any given hour. For the latest treatment of the stacking order, please refer to 3.1 of the AESO Loss Factor Rule.

Q20. The AESO makes more than one reference to an Incapability Factor in the Transmission Loss Factor Methodology and Assumptions Appendix 7. On page 11, the Incapability Factor (ICBF) is defined as equal to 1 – Available Capacity Factor (ACF). However, I have not been able to find a definition for the Available Capacity Factor (ACF) in the document. Can the AESO add a definition for Available Capacity Factor (ACF)?

A20. The definition has been added.

Maxim Question Paper 3.

Comments on Criteria Summary, 2006 Loss Factor Initiative

The AESO has indicated in the Criteria Summary, 2006 Loss Factor Initiative that,

"The loss factor methodology shall produce results that are accurate, repeatable, and predictable."

However, it is unclear what is meant by "accurate" since loss factors are simply an ***allocation*** of transmission losses to generators.

Q21. Can the AESO define what it means by "accurate" and indicate how the AESO has measured the "accuracy" of the various methodologies.

A21. Accurate means the loss factor has been calculated using the approved methodology, accurate data, and only requires a small shift factor to correct for unassigned energy. The AESO measured the required shift factor for each methodology and ranked them based on smallest shift factor as best, largest shift factor as least acceptable. The reason for this method of ranking is that the smaller the shift factor the less loss energy is socialized across all generating units. A small shift factor means that the majority of losses are assigned to generating units by the mathematical formula in the methodology.

It is also unclear what the AESO means by "predictable". The AESO has undertaken to provide forecasts of the loss factors in 2010 for some of the generators on the system using the proposed methodology. These forecasts are non-binding and show significant changes to the loss factors for some generators. However, the AESO has not provided loss factors for the intervening years between 2006 and 2010. As well, the AESO has not provided any details about what transmission additions and/or retirements or generation additions and/or retirements that have been included in the 2010 loss factor estimates. Since stakeholders cannot predict what the loss factors applied to generators will be and the AESO is not providing a prediction of what the loss factors will be for each of the

following years, it is unclear what basis is used to determine that the proposed loss factor methodology is predictable.

The AESO has also indicated,

"Loss factors can be changed in less than one year if the AESO determines that a system upgrade materially changes the line losses,"

this is in apparent conflict with the following criteria,

"Loss factors must apply for a period of not less than one year and not more than 5 years"

The AESO has indicated,

"The methodology for determining loss factors shall incorporate the best technical solution to meet the requirements of the regulation"

Q22. It is unclear how the AESO is evaluating what is the "best" technical solution. Can the AESO clearly indicate the measures it used to determine the "best" technical solution and show how all of the methodologies investigated were assessed against these measures.

A22. For a determination and ranking of methodologies, please refer to AESO's email from April 1, 2005 – 20050401_Decision-Matrix_loss-factors_final.pdf.

The AESO has also indicated,

"Access to the Loss Factor Methodology will be provided in 2006."

Q23. When in 2006 will access to the Loss Factor Methodology be provided and to whom will it be provided?

A23. The exact date has not yet been decided as the exact method of delivery needs to be discussed with the stakeholders – i.e. what solution will meet the needs of the owners. One solution for providing access to the methodology's software program would be for the AESO to provide direct web access through the AESO's website. A second alternative would be for the AESO to provide licensing and the model to a third party consultant chosen by stakeholders. These options will be developed and brought forward to stakeholders later this year. A web based solution is not likely to be available until late 2006.

Q24. Why can't the AESO provide access to the Loss Factor Methodology in 2005 at the same time as the 2006 Loss Factors are determined?

A24. The project plan was developed in conjunction with our consultant and stakeholder group in late 2004. The plan called for prototyping of the software during the technical development phase earlier this year followed by software development based on acceptance of the technical methodology. Software development is now underway. Following AESO acceptance of the software, the

AESO will be able to attend to possible methods that provide stakeholders with access to the loss factor methodology.