AUC

Alberta Utilities Commission

Alberta Electric System Operator, Capital Power Corporation, TransAlta Corporation and TransCanada Energy Ltd.

Applications for review of AUC Decision 2012-104: Complaint by Milner Power Inc. regarding the ISO Transmission Loss Factor Rule and Loss Factor Methodology

April 16, 2014

The Alberta Utilities Commission

Decision 2014-110: Alberta Electric System Operator, Capital Power Corporation, TransAlta Corporation and TransCanada Energy Ltd.
Applications for review of AUC Decision 2012-104: Complaint by Milner Power Inc. regarding the ISO Transmission Loss Factor Rule and Loss Factor Methodology
Application Nos. 1609554, 1609555, 1609556 and 1609557
Proceeding No. 2581

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The Alberta Utilities Commission
Calgary, Alberta

Alberta Electric System Operator, Capital Power Corporation, TransAlta Corporation and TransCanada Energy Ltd. Applications for review of AUC Decision 2012-104: Complaint by Milner Power Inc. regarding the ISO Transmission Loss Factor Rule and Loss Factor Methodology	**Decision 2014-110 Application Nos. 1609554, 1609555, 1609556 and 1609557 Proceeding No. 2581**

1 Introduction and background

1. In June 2012, the Alberta Electric System Operator (AESO) [1], Capital Power Corporation (Capital Power), TransAlta Corporation (TransAlta) and TransCanada Energy Ltd. (TransCanada) filed applications with the Alberta Utilities Commission (AUC or the Commission) seeking a review and variance of AUC Decision 2012-104: *Complaint by Milner Power Inc. Regarding the ISO Transmission Loss Factor Rule and Loss Factor Methodology*.

2. For the purposes of this decision, the members of the Commission panel who authored the majority decision in Decision 2012-104 are collectively referred to as the "hearing panel" and the Commission panel that considered the review and variance applications is referred to as the "review panel".

3. In Decision 2013-159: *Decision on Preliminary Phase of Request for Review and Variance of AUC Decision 2012-104*, issued on April 23, 2013, the review panel stated that it would approach the issues in this proceeding by first examining how the AESO's line loss rule operates and the submissions made by the parties regarding the hearing panel's findings of fact. The review panel stated that it would then consider whether ISO rule 9.2: *Transmission Loss Factors* and Appendix 7: *Transmission Loss Factor Methodology and Assumptions* (collectively the 2005 Line Loss Rule) complies with Section 19 of the 2004 *Transmission Regulation* and whether the complaint under Section 25(6)(b) of the 2003 *Electric Utilities Act* that the 2005 Line Loss Rule was unjust, unreasonable, unduly preferential, arbitrarily or unjustly discriminatory or inconsistent with or in contravention of [the] Act or the regulations is made out.[2]

1.1 Procedural background

1.1.1 Original complaint (2005)

4. On August 17, 2005, Milner Power Inc. (Milner) filed a complaint with the Commission's predecessor, the Alberta Energy and Utilities Board (EUB or the Board). Milner's complaint sought relief under Section 25(6) of the 2003 *Electric Utilities Act* which provided that the Board may order the AESO to revoke or change a provision of an independent system

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[1] In Alberta, the role and obligations of the Independent System Operator (ISO) are fulfilled by the Alberta Electric System Operator (AESO).

[2] AUC Decision 2013-159, April 23, 2013, page 14, paragraph 50.

operator (ISO) rule that, in the Board's opinion, is unjust, unreasonable, unduly preferential, arbitrarily or unjustly discriminatory or inconsistent with or in contravention of the 2003 *Electric Utilities Act* or its regulations.[3]

5. The grounds for Milner's complaint relevant to this proceeding were that the 2005 Line Loss Rule did not comply with sections 19(1)(a) and 19(2)(d) of the 2004 *Transmission Regulation* and contravened the principle of stability in locational signals essential to the underlying purpose of the 2004 *Transmission Regulation.*[4]

6. On December 30, 2005, the Board issued EUB Decision 2005-150 in which it denied Milner's complaint and held that the AESO was free to implement its 2005 Line Loss Rule effective January 1, 2006. Milner subsequently appealed this decision to the Court of Appeal of Alberta.

7. On July 29, 2010, in its judgment, *Milner Power Inc. v. Alberta (Energy and Utilities Board)*, 2010 ABCA 236, the Court of Appeal of Alberta ruled that "[t]he Board's Decision 2005-150 is vacated and the matter is remitted to the Board to continue to further investigate or hold a hearing to determine whether there was a contravention of section 19 as alleged."

1.1.2 Proceeding No. 790 and Decision 2012-104

8. On September 20, 2010, the Commission issued a notice of proceeding designated as Proceeding No. 790.[5] In a letter dated February 28, 2011, the Commission bifurcated Proceeding No. 790 into two phases: the first phase to consider whether the 2005 Line Loss Rule contravened Section 19 of the 2004 *Transmission Regulation* and the second phase to determine the appropriate relief should the complaint be upheld.[6]

9. The hearing of the first phase of Proceeding No. 790 was conducted from October 19 to October 22, 2011, with written argument following. Decisions 2012-104 and 2012-105: *Complaint by Milner Power Inc. Regarding the ISO Transmission Loss Factor Rule and Loss Factor Methodology – Transmission Must Run*[7] were issued by the Commission on April 16, 2012. In Decision 2012-104, the hearing panel determined that the complaint by Milner was valid and that the Commission would proceed to the next phase of the proceeding.[8] One Commission member issued a dissenting opinion upholding the 2005 Line Loss Rule.[9]

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3 Exhibit 2.1, Milner, Complaint Application Electric Utilities Act Sections 25 and 26, August 17, 2005, pages 1 and 2.
4 Exhibit 2.1, Milner, Complaint Application Electric Utilities Act Sections 25 and 26, August 17, 2005, page 3.
5 Exhibit 64.01, AUC Notice of Proceeding, September 20, 2010.
6 Exhibit 110.01, AUC Ruling re Bifurcation, February 28, 2011.
7 The use of transmission must run generation when calculating loss factors was an issue in Proceeding No. 790. The Commission issued Decision 2012-105 regarding this issue, which the Commission considered is a separate issue from the methodology used to calculate loss factors.
8 AUC Decision 2012-104, April 16, 2012, page 33 paragraph 167.
9 Commission Member Tudor Beattie found that the Line Loss Rule did not contravene Section 19 of the 2004 *Transmission Regulation*, and nor was it in contravention of the 2003 *Electric Utilities Act*. AUC Decision 2012-104, April 16, 2012, pages 34 to 50.

1.1.3 Proceeding No. 1945 and Decision 2013-159

10. In June 2012, the Commission received four applications seeking a review and variance of Commission Decision 2012-104 (the review and variance applications), pursuant to Section 10 of the *Alberta Utilities Commission Act* and AUC Rule 016: *Review of Commission Decisions* (Rule 016). The applications were filed by the AESO, Capital Power, TransAlta and TransCanada (the review applicants) and were assigned Application Nos. 1608555, 1608540, 1608554 and 1608553, respectively, by the Commission. In this proceeding, Capital Power, TransAlta and TransCanada are collectively referred to as the Generator Group. The preliminary phase of the review and variance applications was designated as Proceeding No. 1945.

11. On June 11, 2012, Milner submitted a second complaint to the Commission regarding revisions to the 2005 Line Loss Rule that took effect on January 1, 2009. Milner requested that its original complaint filed on August 17, 2005 also apply with equal effect to periods, and revisions of the 2005 Line Loss Rule, beyond January 1, 2009. On July 30, 2012, ATCO Power Ltd. (ATCO Power) filed a similar complaint. These two complaints are collectively referred to as "the 2012 complaints".[10]

12. The Commission issued Decision 2013-159 on April 23, 2013, and found that the review applicants had demonstrated a substantial doubt as to the correctness of Decision 2012-104 and granted a second stage consideration of review and variance of Decision 2012-104.[11] The review panel also indicated that during the second stage of this proceeding, it would not consider the 2012 complaints or whether the original complaint by Milner extended beyond 2008.[12]

1.1.4 Current Proceeding No. 2581

13. On May 3, 2013, the Commission issued a notice of review stating that a hearing would be held to consider the review and variance of Decision 2012-104 as granted in Decision 2013-159. The resulting proceeding was designated as Proceeding No. 2581.[13]

14. The Commission's notice reiterated a determination of Decision 2013-159 that Proceeding No. 2581 would not consider the 2012 complaints or whether the original complaint by Milner extended beyond 2008. This notice also announced that the parties and evidence in Proceeding No. 790 would be considered incorporated into Proceeding No. 2581.[14] The record of Proceeding No. 1945 was also incorporated into Proceeding No. 2581.[15]

15. The Commission heard the oral portion of this proceeding at the Commission's hearing room at the AUC offices in Calgary on October 7 through October 18, 2013, with written argument following.

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[10] The Milner and ATCO complaints from 2012 are filed as Application 1608563 and 1608709, respectively.
[11] AUC Decision 2013-159, April 23, 2013, page 16, paragraph 57.
[12] AUC Decision 2013-159, April 23, 2013, page 15, paragraph 53.
[13] Due to limitations in its electronic filing system, in order to initiate the second phase of the variance application the Commission created 4 new applications on May 3, 2013 relating to the review applicants: 1609554 – Capital Power, 1609555 – TransCanada, 1609556 – TransAlta, 1609557 – AESO.
[14] Exhibit 316.01, AUC, Notice of Review, May 3, 2013, pages 1 and 2.
[15] Proceeding No. 2581, Tr. Vol. 4, October 10, 2013, page 710, line 4 to page 711, line 2.

16. The Commission considers the record for Proceeding No. 2581 closed on January 16, 2014.

1.2 Overview of transmission line losses and the 2005 Line Loss Rule

Transmission line losses

17. The transmission of electrical power from one point to another on a transmission system inevitably entails the loss of some energy in the form of heat because of resistance encountered on transmission lines and in grid transformers. Transmission line losses are simply the difference between the amount of energy that is received onto the transmission system from generating units and the amount of energy that is actually delivered at the various points of delivery on the transmission system. Metering points located throughout the transmission system ensure that line losses, in the aggregate, are accurately measured and recorded in real time.

18. Line losses at any instant are a function of both the resistance of the transmission system and power flow. In general, the further power is transmitted over a line, the greater the resistance encountered and the higher the losses. In addition, line losses will vary with the square of the power flow on the line. Holding everything else constant, doubling the power flow on a transmission line will quadruple the line losses. This latter relationship is expressed mathematically as follows: $L \approx aP^{2,}$ where L is line loss, a is a constant, and P is the power flow on the line. [16]

19. The regulatory framework in Alberta requires that the costs of the lost energy associated with line losses be recovered, at least at first instance, from generating units and not transmission companies or final consumers of electrical energy. Generating units, therefore, when calculating the prices they offer into the power pool will take into consideration the line losses assigned to them by the AESO's line loss rule. The manner in which line loss costs are determined and assigned to each generating unit will, therefore, have a bearing on competitive market outcomes.

20. Because system-wide losses can be measured continuously at metering points, determining the actual aggregate energy losses on the transmission system during any chosen period is not an issue in this proceeding. The more difficult task, and one of the central issues in this proceeding, is determining what portion of the cost of total system-wide losses should be attributed and charged to each generating unit. In fact, the issue is even more complex than this because not all generating units increase line losses. Some generating units reduce line losses on the transmission system, at least some of the time, and some do so over long periods of time.

21. Another complication is that in an integrated electric system, at any moment in time, total system-wide losses are determined by the interactions of, and interdependencies between, all generating units and all loads on the system, their location relative to each other, the nature and capacity of all transmission lines linking them and various other elements of the overall system. Indeed, the properties of electrical energy and the manner of its propagation over an integrated electric system such as the Alberta Interconnected Electric System (AIES) are such that it is

[16] AUC Decision 2012-104, April 16, 2012, pages 4 and 5, paragraphs 14 and 15.

impossible to directly observe or measure how much of any *single* generating unit's output is lost in the transmission process.

22. Notwithstanding the physical impossibility of measuring any given generating unit's "own losses" (i.e., that percentage of its own total generation that is lost as heat while being delivered to meet load), it is possible to calculate the marginal[17] change in total system losses resulting from changes in each generating unit's output (and to produce such calculations as frequently as desired). This approach lies at the heart of the AESO's Corrected R-Matrix 50 per cent Area Load Adjustment Methodology (used in the 2005 Line Loss Rule).

AESO loss factor calculations

23. Based on ISO rule 9.2 and Appendix 7, the Commission understands that raw loss factors produced by the AESO are calculated as follows. The AESO used historical and forecast data, including expected changes to the transmission system and generation and load distribution, to create twelve snapshot base cases (peak, median and light load levels for winter, spring, summer and fall) to represent all 8,760 hours for the next year. Using the data from the twelve base cases, the AESO uses the Corrected R-Matrix 50 per cent Area Load Adjustment Methodology to extract twelve raw loss factors (one for each of the base cases) for each generating unit.

24. The AESO evaluated a number of methodologies to calculate raw loss factors. In its report titled *Loss Factor Methodologies Evaluation Part 1 – Determination of 'Raw' Loss Factors and Load Flow Shift Factors (revised May 22, 2007),* the AESO noted in paragraph 3.11 that "[i]t will be shown that the losses assigned by the area load adjustment methodology are almost twice the actual losses. The loss factors calculated using area load adjustment will be reduced by 50 per cent to determine the average losses and unassigned losses and the shift factor will be recalculated." In the AESO methodology the loss factor calculated in each base case is reduced by 50 per cent in order to arrive at what the AESO calls raw loss factors (hence the full title Corrected R-Matrix 50 per cent Area Load Adjustment Methodology). The methodology has commonly come to be referred to as the MLF/2 (marginal loss factor divided by two) methodology.

25. Further adjustments are made to the raw loss factors to address various other requirements of sections 19 to 22 of the 2004 *Transmission Regulation* before the loss factors can be finalized.

26. For each of the twelve base cases, the AESO applies a load flow shift factor to each generating unit's raw (MLF/2) loss factor so that losses calculated using the raw (MLF/2) loss factors match the forecast losses, which results in twelve adjusted raw (MLF/2) loss factors for each generating unit. For each generating unit, the three adjusted raw (MLF/2) loss factors for each season (peak, median and light) are multiplied by time-weighted factors to give a set of four seasonal raw (MLF/2) loss factors. If seasonal energy losses calculated from the seasonal raw loss factors do not match forecast seasonal energy losses, the AESO applies a seasonal shift

[17] An estimate of the change in the total (and average) system losses resulting from a small or marginal increase in the output of a generating unit is used to derive a marginal loss factor for that generating unit. It is usually expressed as a percentage.

factor to each generating unit's seasonal raw (MLF/2) loss factor so that losses calculated from seasonal raw (MLF/2) loss factors matched the seasonal energy losses, which results in four seasonal adjusted loss factors for each generating unit.

27. The normalized annual loss factor for each generating unit is calculated from the weighted average of the four seasonal adjusted loss factors. If any generating unit's normalized annual loss factor fell outside the allowable range (i.e., "collars") set by the 2004 *Transmission Regulation*, the AESO clipped the loss factor to just reach the collar, and then applied a shift factor and compression (if necessary) to ensure that annual energy losses were collected and no other loss factors fell outside the allowable range.[18]

28. The AESO assigns a loss factor to each generating unit each year. Unless it is changed during a year (pursuant to specific provisions of the 2004 *Transmission Regulation*) it remains in effect for the whole year and it is applied to every unit of energy provided to the AIES by the generating unit. The next year's loss factors are calculated by forecasting the next year's conditions and calculating and assigning loss factors based on the forecast. The 2004 *Transmission Regulation* provides for a true-up of the prior year's over or under-collection in the following year.

Observations

29. The calculations under the AESO's 2005 Line Loss Rule do not distinguish between a generating unit's own losses and the consequential losses or loss savings on the rest of the system attributable to a small change in that generating unit's output. Strictly speaking, there is no need for such a distinction, of course, since all that is being estimated for each generating unit is the total change in line losses that would result from a small change in its own output. The review panel observes that under the 2005 Line Loss Rule, the estimated change in total transmission line losses attributable to a marginal increase in the output of a given generating unit will always be a combination of two things: (1) the increase in the generating unit's own losses and (2) the change in aggregate line losses on the rest of the system attributable to the change in that generating unit's output (which, in turn, is the change in the sum of the own losses of the other generating units on the system).

30. The first category, a generating unit's own losses, must always be positive or zero. (They will be zero, for example, when the generating unit is not operating, or if there is no physical distance between the generating unit and the full load it is meeting, such as when a generating unit locates immediately adjacent to a single large industrial customer and connects its power supply directly to it). Own losses can never be negative since all transmission results in some heat loss due to resistance on the line.

31. The second category of line losses, by comparison, can be either positive or negative. Negative losses occur whenever energy being delivered onto the transmission system from a given generating unit results in the displacement, on an aggregate basis, of energy associated with higher line losses that was being delivered to the system by one or more generating units elsewhere on the system. In such an event, the net change to total system losses attributable to

[18] Exhibit 133.03, ATCO Power Evidence, April 14, 2011, Attachment 3.

the generating unit in question will be the difference between the increase in its own losses and the loss savings elsewhere on the system attributable to the change in its output. If the savings from displacing output associated with higher line losses outweigh the change in the generating unit's own losses, that generating unit will be a loss saver at that time and at that level of output. If, instead, the generating unit causes output associated with lower line losses to be displaced then it will be adding to total system losses (or average system losses) at that time and for that level of output.

32. The second category of line losses can be thought of as an externality (whether positive or negative) resulting from the change in output of the generating unit in question. These consequential losses or savings on the rest of the system are akin to an externality because they are not the result of conscious output decisions made by a generating unit but, rather, are simply the result of how energy flows on the system itself. Whenever the externalities are positive and the resulting savings on the rest of the system are greater in magnitude than the generating unit's own losses, the generating unit in question will be a net contributor to savings at its current level of output. Conversely, if the generating unit displaces production associated with lower line losses (i.e., creates negative externalities) then the conclusion to be drawn is that its last unit of output (but not necessarily any of its intra-marginal units of output) is adding to total (and average) system line losses.

2 Legislation

33. Section 5 of the 2003 *Electric Utilities Act* addresses the purposes of the legislation which include:

> (b) to provide for a competitive power pool so that an efficient market for electricity based on fair and open competition can develop, where all persons wishing to exchange electric energy through the power pool may do so on non-discriminatory terms and may make financial arrangements to manage financial risk associated with the pool price;
>
> (c) to provide for rules so that an efficient market for electricity based on fair and open competition can develop in which neither the market nor the structure of the Alberta electric industry is distorted by unfair advantages of government-owned participants or any other participant;
>
> (d) to continue a flexible framework so that decisions of the electric industry about the need for an investment in generation are guided by competitive market forces;
>
> …
>
> (h) to provide for a framework so that the Alberta electric industry can, where necessary, be effectively regulated in a manner that minimizes the cost of regulation and provides incentives for efficiency.

34. Section 6 of the 2003 *Electric Utilities Act* states: Market participants are to conduct themselves in a manner that supports the fair, efficient and openly competitive operation of the market.[19]

35. Section 16 of the 2003 *Electric Utilities Act* imposes on the AESO, among other things, the duty to act responsibly:

> The Independent System Operator must exercise its powers and carry out its duties, responsibilities and functions in a timely manner that is fair and responsible to provide for the safe, reliable and economic operation of the interconnected electric system and to promote a fair, efficient and openly competitive market for electricity.

36. Section 17 of the 2003 *Electric Utilities Act* imposes on the AESO, among other things, duties:

> (a) to operate the power pool in a manner that promotes the fair, efficient and openly competitive exchange of electric energy;
>
> (b) to facilitate the operation of markets for electric energy in a manner that is fair and open and that gives all market participants wishing to participate in those markets and to exchange electric energy a reasonable opportunity to do so;
>
> (c) to determine, according to relative economic merit, the order of dispatch of electric energy and ancillary services in Alberta and from scheduled exchanges of electric energy and ancillary services between the interconnected electric system in Alberta and electric systems outside Alberta, to satisfy the requirements for electricity in Alberta;
>
> …
>
> (e) to manage and recover the costs of transmission line losses;
>
> …
>
> (g) to provide system access service on the transmission system and to prepare an ISO tariff;
>
> (h) to direct the safe, reliable and economic operation of the interconnected electric system;
>
> (i) to assess the current and future needs of market participants and plan the capability of the transmission system to meet those needs;
>
> (j) to make arrangements for the expansion of and enhancement to the transmission system;

[19] The terms fair, efficient, and openly competitive are often characterized as FEOC.

…

37. Section 18(1) of the 2003 *Electric Utilities Act* prescribes that the AESO "must operate the power pool in a manner that is fair, efficient and open to all market participants exchanging or wishing to exchange electric energy through the power pool and that gives all market participants a reasonable opportunity to do so."

38. Section 20(1) of the 2003 *Electric Utilities Act* authorizes the ISO to make rules respecting, among other things, the practices and procedures of the ISO, the operation of the power pool and the exchange of electric energy through the power pool, the operation of the interconnected electric system, and planning the transmission system, including criteria and standards for the reliability and adequacy of the transmission system.

39. Section 25 of the of the 2003 *Electric Utilities Act* authorizes the Board, now the Commission, after hearing an ISO rule complaint, to order the ISO to revoke or change a provision of an ISO rule that, in the Commission's opinion, "is unjust, unreasonable, unduly preferential, arbitrarily or unjustly discriminatory or inconsistent with or in contravention of" the 2003 *Electric Utilities Act* or the regulations.

40. Specific provisions dealing with transmission line losses are set out in sections 19 to 22 of the 2004 *Transmission Regulation* as follows:

Transmission system loss factors

19(1) The ISO must make rules to

(a) reasonably recover the cost of transmission line losses on the interconnected electric system by establishing and maintaining loss factors for each generating unit based on their location and their contribution, if at all, to transmission line losses;

(b) determine the anticipated transmission line losses for a specified period of time and determine the average transmission system loss factor for that specified period;

(c) establish a means of determining, for each location on the transmission system, loss factors and associated charges and credits, which are anticipated to result in the reasonable recovery of transmission line losses;

(d) provide a means by which, annually, a determination will be made of the difference between the anticipated transmission line losses and the actual transmission line losses;

(e) subject to section 21, provides a means through the application of a calibration factor to adjust the amounts paid by the application of the loss factor described in clause (c) so

that the owners of generating units pay the actual transmission line losses or receive a credit for overpayment.

(2) In accordance with the rules made under subsection (1), the ISO must determine loss factors having regard to the following:

(a) loss factors must apply for a period of at least one year but not more than 5 years, subject to clause (b);

(b) a loss factor applied under clause (a) may not be changed during the period it applies unless, in the opinion of the ISO, a transmission system upgrade or enhancement materially affects transmission line losses;

(c) loss factors must be determined for each location on the transmission system as if no abnormal operating conditions exist;

(d) the loss factor in each location must be representative of the impact on average system losses by each respective generating unit or group of generating units relative to load;

(e) the loss factor must be one number at each location that does not vary, except as a result of revisions referred to in clause (b) or the reapplication of loss factors under clause (a);

(f) after determining which loss factors result in a charge or credit, every loss factor must be multiplied by a common number in order to limit the loss factors as follows:

(i) loss factors associated with a charge must not exceed 2 times the average transmission system loss factor, and

(ii) loss factors associated with a credit must not exceed one times the average transmission system loss factor.

Loss factors to be publicly available

20(1) The ISO must make rules with respect to the designation of loss factors in any place in Alberta where a generating unit is not located, and on request, determine a loss factor with respect to a generating unit that a person proposes to construct.

(2) Loss factors determined under section 19 and subsection (1) must be made publicly available for each location on the transmission system.

Adjustment of loss factors

21(1) In accordance with the rules, loss factors may be adjusted by a

calibration factor to ensure that the actual cost of losses is reasonably recovered through charges and credits under the ISO tariff on an annual basis.

(2) If the actual cost of losses is over or under recovered in one year, the over or under recovery must be collected or refunded in the next year or subsequent years.

Recovery of transmission losses

22(1) In accordance with the ISO tariff and the loss factors determined under this Part,

(a) the owner of a generating unit must pay location-based loss charges or receive credits;

(b) importers of electric energy under a firm service arrangement must pay location-based loss charges or receive credits.

(2) A person receiving transmission service under an interruptible service arrangement for load, import or export must pay location-based loss charges that recover the full cost of losses required to provide this service.

2.1 Statutory interpretation

41. Commission consideration of the review and variance of Decision 2012-104 requires consideration and interpretation of various provisions of the 2003 *Electric Utilities Act* and sections of the 2004 *Transmission Regulation* made under that legislation that were in force when Milner filed its complaint on August 17, 2005.

42. In *Balancing Pool v TransAlta Corporation*, 2013 ABCA 409, the Alberta Court of Appeal reiterated general principles of statutory interpretation. The case there under appeal involved interpretation of the 2003 *Electric Utilities Act*, the legislation under consideration in this proceeding and interpretation of a different regulation made under it. The following passages at paragraphs 37, 19 and 23 are applicable to this proceeding.

> Courts have long adopted Driedger's modern principle as the method to follow for statutory interpretation: "...the words of an Act are to be read in their entire context, in their grammatical and ordinary sense harmoniously with the scheme of the Act, the object of the Act and the intention of Parliament": E.A Driedger, *Construction of Statutes*, 2nd Ed (Butterworths: Toronto, 1983) at 87; see for example: *Re Rizzo and Rizzo Shoes Ltd*, 1 [1998] SCR 27, 154 DLR (4th) 193; *Bell ExpressVu Limited Partnership v Rex*, 2002 SCC 42, [2002] 2 SCR 559;*ATCO Gas & Pipelines Ltd v Alberta (Energy and Utilities Board)*, 2006 SCC 4, 263 DLR (4th)193 at para 37.
>
> In *ATCO Gas v AEUB*, 2006 SCC 4, [2006] 1 SCR 140 (*ATCO Gas*), Bastarache J. approached the interpretation of the relevant statutory provisions at issue by looking first at the grammatical and ordinary meaning of those provisions, then at the entire

> statutory context and the legislative intent, including the applicability of the doctrine of necessary implication. We adopt a similar framework here – at para 19.
>
> The provisions in s 2 of the *Regulation* are part of a larger statutory scheme which must also be considered. As the Supreme Court has recently stated, "the ultimate goal is to discover the clear intent of the legislature and the true purpose of the statute while preserving the harmony, coherence and consistency of the legislative scheme": *ATCO Gas* at para 49. In this regard, the Supreme Court cited with approval the following comment by Pierre-Andre Côté:
>
> > As the product of a rational and logical legislature, the statute is considered to form a system. Every component contributes to the meaning as a whole, and the whole gives meaning to its parts: "each legal provision should be considered in relation to other provisions, as part of a whole"… (P. A. Cote, The Interpretation of Legislation in Canada (3rd ed 2000, at page 308)) – at para 23

43. As indicated in *Sullivan on the Construction of Statutes*,[20] generally the rules governing the meaning of statutory texts and the types of analysis relied upon by interpreters to determine legislative intent apply equally to regulations. Regulations too must be read in the context of their enabling statute, having regard to the language and purpose of the act in general and more particularly the language and purpose of the relevant enabling provisions.[21] This is consistent with Section 13 of the *Interpretation Act*[22] which provides that interpretation provisions in an enactment apply to regulations made under an enactment.

44. An additional legal issue raised by parties in this proceeding was the consideration of extrinsic evidence such as the Alberta government's 2003 *Transmission Development: The Right Path for Alberta – A Policy Paper*[23] (*Transmission Development Policy*). This policy paper was intended to serve as the basis for the development of a regulation dealing with transmission issues.

45. It is settled law that policy documents or extrinsic aids can assist in the legislative history of an enactment when interpreting legislation. Legislative history materials can be used as indirect evidence of meaning or purpose, but not as direct evidence of the Legislature's intent. Extrinsic aids, such as policy documents, legislative debates, briefs, and other materials, serve to clarify statutory provisions that are ambiguous or uncertain. In *Morguard Properties Ltd. v. Winnipeg (City)* the Supreme Court of Canada stated:

> It has, of course, been long settled that, in the interpretation of a statute… the report of a commission of enquiry such as a Royal Commission may be used in order to expose and examine the mischief, evil or condition to which the Legislature was directing its attention. However, in the interpretation of a statute, the court, according to our judicial philosophy, may not draw upon such reports and commentaries, but must confine itself to

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20 *Sullivan on the Construction of Statutes*, 5th edition, page 368.
21 *Bristol-Myers Squibb Co. v. Canada (Attorney General)* [2005] 1 SCR 533, 2005 SCC 26.
22 *Interpretation Act*, S.A. 2000, Chapter I-8.
23 Exhibit 133.03, ATCO Power Evidence, April 14, 2011, pdf page 280.

> an examination of the words employed by the Legislature in the statutory provision in question and the context of that provision within the statute.[24]

46. Another principle of statutory interpretation relevant to this proceeding is found in the *Broadcasting Regulatory Policy Reference* case, 2012 SCC 68. The Supreme Court of Canada held that policy statements in legislation are not jurisdiction-creating provisions and "as such, declarations of policy cannot serve to extend the powers of the subordinate body to spheres not granted to it by Parliament in jurisdiction-conferring provisions."[25]

47. The AESO and the AUC are government agencies "which are statutory creations: they cannot exceed the powers that were granted to them by their enabling statute; they must "adhere to the confines of their statutory authority or 'jurisdiction' [; and t] hey cannot trespass in areas where the legislature has not assigned to them authority."[26]

3 Approaches to considering the 2005 Line Loss Rule

48. Parties advanced a number of approaches to considering whether the 2005 Line Loss Rule complies with the 2003 *Electric Utilities Act* and the 2004 *Transmission Regulation*. A number of parties urged the review panel to consider the meaning of the 2004 *Transmission Regulation* in the context of the historical development of the Alberta competitive market structure and the history of the development of the 2005 Line Loss Rule. For example, Ms. Terry, on behalf of the AESO, stated that the AESO interpreted its mandate to permit it to look beyond the words of the legislation and regulations to consider the history of the development of the market policy as follows:

> "The AESO considers the guidance of all of the policies, the transmission policy, the market policy, in the context of what we read in the regulations and the Act, and it provides us absolute guidance on how we develop our rules[27]... In fact, it was probably in a place that wasn't acceptable -- the transmission-- most of the Transmission Development Policy found its way into a regulation. So clarity that was required on the interpretation of the policy could be found in a regulation, whereas most of the market policy didn't find itself into any regulation. It was viewed that the *Electric Utility Act* could provide guidance for where we were going as an industry.[28]
>
> The policy documents still provide a lot of helpful guidance for conversations in industry; however, in this particular case when a regulation comes out and it's absolutely prescriptive and when we read it in the context of the rest of the market and transmission framework, which includes the Act, it's clear to us that the signal for losses, which was

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[24] [1983] 2 SCR 493 at 498.
[25] [2012] SCC 68 at para 22.
[26] Mullan, David J. *Administrative Law*, Toronto: Irwin Law, 2001 at pp. 9-10 (see also S. Blake, *Administrative Law in Canada*, (3rd ed. 2001), at pp. 183-184) quoted with approval in *ATCO Gas & Pipelines Ltd. v. Alberta (Energy & Utilities Board)*, 2006 SCC 4.
[27] Proceeding No. 2581, Tr. Vol. 4, October 10, 2013, page 744, lines 15 to 19.
[28] Proceeding No. 2581, Tr. Vol. 4, October 10, 2013, page 744, line 23 to page 745, line 5.

> your original question, is certainly a smaller priority within the unconstrained system and the view of a single price."[29]…
>
> "[W]e absolutely look to meet the objectives of the Act, which we think defines our role in facilitating a market for competition. And where the balance goes is in some of the documents that actually don't make their way into regulation, like the market policy and the details around the structure of the market, which do require some tradeoffs and considerations in rule design but still gets you to a place where you're facilitating fair, efficient and open competition"[30]

49. Some parties employed similar approaches by describing the history of the previous line loss rule, the development of the current line loss rule and made references to government policy documents. The AESO also provided, in response to a request by the Commission, a series of drafts of the 2004 *Transmission Regulation* and related materials leading up to the proclamation of that regulation.

50. The history of the previous line loss rule,[31] the complaints about that rule,[32] the positions of parties seeking changes to that rule through legislative changes (including the financial consequences for various parties),[33] a series of policy changes,[34] positions taken by various generators and in various government documents dealing with the market model in Alberta, including responsibility for the costs of transmission and the ISO's duty to maintain an unconstrained transmission system,[35] the give and take of various discussions,[36] and assertions of how the evolution of the Alberta market model should be interpreted to give effect to the positions of various parties, all figured prominently in the submissions of parties during the hearing and in argument and were all called upon to support various interpretations of the 2003 *Electric Utilities Act* and the 2004 *Transmission Regulation*.

51. In this context, the AESO and others objected to the hearing panel's finding that economic efficiency is the guiding value for the interpretation of the 2003 *Electric Utilities Act*

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29 Proceeding No. 2581, Tr. Vol. 4, October 10, 2013, page 745, lines 14 to 22.

30 Proceeding No. 2581, Tr. Vol. 4, October 10, 2013, page 858, line 24 to page 859, line 7.

31 Exhibit 343.04, ESBI Alberta Ltd. or ESBI Alberta LTO. Transmission Administrator, Loss Factor Calculation Methodology, Revision 03, June 24, 2002.

32 For example: Exhibit 205.01, AESO Evidence, July 28, 2011, page 9; ID 790 Tr. Vol. 3, October 21, 2011, page 690-691; Tr. Vol. 4, October 22, 2011, pages 955-956; Exhibit 293.01, AESO Argument, November 30, 2011, pages 5-6; Exhibit 321.02, Generator Group, May 27, 2013, Section 4, pages 8-10; ID 2581 Tr. Vol. 2, October 8, 2013, pages 235-236; ID 2581 Tr. Vol. 3, October 9, 2013, pages 502-503; ID 2581 Tr. Vol. 4, October 10, 2013, pages 639-640; ID 2581 Tr. Vol. 4, October 10, 2013, pages 870-871; ID 2581 Tr. Vol. 5, pages 1049-1053; Exhibit 480.02, Written Argument-in-Chief on Behalf of the Generator Group, November 27, 2013, pages 7-8; Exhibit 482.02, Written Argument of the AESO, November 27, 2013, pages 18-22;

33 Exhibits 467.01 to 467.14, AESO Historical Transmission Regulation Documentation, October 18, 2013.

34 Exhibit 133.03, ATCO Power Evidence, Attachment 7 of the AESO Transmission Development The Right Path for Alberta- A Policy Paper, November 2003.

35 For example, Exhibit 482.02, AESO Written Argument, November 27, 2013, pages 18-22.

36 Exhibit 18.01, AESO, Summary of the Development of the ISO Transmission Loss Factor Rule, October 6, 2005 (this summary is an attachment to Exhibit 20.01, AESO letter to Alberta Energy and Utilities Board dated October 6, 2005); Exhibit 223.02, AESO 2006 Transmission Loss Factor Methodology Decision Document, October 18, 2005.

and the 2004 *Transmission Regulation*.[37] [38] [39] The Generator Group argued that each of the requirements of the "fair, efficient and openly competitive" standard for the market set out in the legislation should receive equal weight so that one is not more important than another and that the public interest is served by balancing the requirements.[40]

52. In the review panel's view, and consistent with the applicable principles of statutory interpretation[41] the 2004 *Transmission Regulation* must be interpreted with a view to achieving the objectives of the legislation. Section 5(b) of the 2003 *Electric Utilities Act* states as one of its objectives: "to provide for a competitive power pool so that an efficient market for electricity based on fair and open competition can develop, where all persons wishing to exchange electric energy through the power pool may do so on non-discriminatory terms and may make financial arrangements to manage financial risk associated with the pool price." Section 5(c) states an objective to be: "to provide for rules so that an efficient market for electricity based on fair and open competition can develop in which neither the market nor the structure of the Alberta electric industry is distorted by unfair advantages of government-owned participants or any other participant." As the purposes are described, fairness and openness are a means to an end – an efficient market.

53. While parties often referred to the fair, efficient and openly competitive operation of the market as being one thing and referred to it as the FEOC principle,[42] [43] it is instructive to examine how the words are used in various sections of the 2003 *Electric Utilities Act* which describe duties of various entities.

54. Section 16 describes the ISO's general duty. It states: "The Independent System Operator must exercise its powers and carry out its duties, responsibilities and functions in a timely manner that is fair and responsible to provide for the safe, reliable and economic operation of the interconnected electric system and to promote a fair, efficient and openly competitive market for electricity."

55. Section 17 gives more specific guidance to the ISO. Section 17(a) of the 2003 *Electric Utilities Act* states that the ISO has the duty to "operate the power pool in a manner that promotes the fair, efficient and openly competitive exchange of electric energy." Section 17(b) specifies the duty of the ISO to "facilitate the operation of markets for electric energy in a manner that is fair and open and that gives all market participants wishing to participate in those markets and to exchange electric energy a reasonable opportunity to do so."

56. Section 18(1) states that the ISO "must operate the power pool in a manner that is fair, efficient and open to all market participants exchanging or wishing to exchange electric energy through the power pool and that gives all market participants a reasonable opportunity to do so."

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37 Proceeding No. 2581, Tr. Vol. 3, October 9, 2013, page 584 line 16 to page 585 line 1.
38 Exhibit 482.02, AESO Argument, November 27, 2013, page 20.
39 Proceeding No. 2581, Tr. Vol. 5, October 11, 2013, page 1064, lines 2 to 23.
40 Exhibit 480.02, Generator Group Argument, November 27, 2013, page 36.
41 *Sullivan on the Construction of Statutes*, 5th edition, page 368.
42 Exhibit 482.02, Generator Group Argument, November 27, 2013, page 4.
43 Exhibit 296.01, EEC Argument, November 30, 2011, page 2.

That is, Section 18(1) instructs the ISO itself to be fair and efficient in its operation of the power pool and to ensure that the power pool is open to market participants.

57. In the review panel's view, sections 17(a) and (b) and Section 18(1) instruct the ISO on its role in achieving the Legislature's objective of an efficient market for electricity. The ISO's role is to create fair and open conditions under which competitors can compete so that the market can operate efficiently. A fair and open market structure will allow competitors and, hence, the competitive market, to operate efficiently. The responsibility that is placed on the market participants under Section 6 of the 2003 *Electric Utilities Act* is to "conduct themselves in a manner that supports the fair, efficient and openly competitive operation of the market." As pointed out in the hearing, it is the Market Surveillance Administrator's (MSA) duty to ensure that market participants conduct themselves in that manner. At the same time, the ISO itself must be fair and efficient, and must ensure that the power pool is open to market participants.

58. There is no inconsistency or tension between or among the requirements for fairness, openness and efficiency that needs to be balanced in order to achieve the public interest. The public interest is expressed in the objective -- an efficient market for electricity based on fair and open competition. The ISO's role is to create the conditions under which an efficient market for electricity can develop within the parameters of the market model specified in the 2003 *Electric Utilities Act* and the 2004 *Transmission Regulation*.

59. One of the principal considerations urged upon the Commission in assessing the 2005 Line Loss Rule was that the market model with a single pool price should not be distorted by line loss factors that differed significantly among generating units. The AESO stated that the adoption of a policy of an unconstrained transmission system (which reduces line losses on the transmission system) together with the policy of recovering the costs of the transmission system from end-use customers (rather than the generating units) [44] through a postage stamp rate means the differences in the costs of extending the transmission system to different generating units would not affect the prices offered by generating units into the market. The objective, according to the AESO, is to get competition at the generation level[45] and that line loss factors should not overtake competition in the energy market.[46] In other words, the objective asserted by the AESO and the Generator Group is to have generating units compete on the basis of their relative costs of generation without having to take into account the costs of the transmission system or be affected significantly by the costs of losses the generating units may be responsible for on the transmission system. The AESO and the Generator Group argued that minimizing the range of line loss factors would be efficient in the context of the market policy and transmission policy.[47]

60. The review panel considers that efficiency cannot be considered independently of the market model as it is specified in the 2003 *Electric Utilities Act* and the 2004 *Transmission Regulation*. While the system evolved to eliminate differences in transmission charges paid by

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[44] As per sections 16 to 18 of the 2004 *Transmission Regulation.*
[45] Proceeding No. 2581, Tr. Vol. 3, October 9, 2013, page 531, lines 23 to 25.
[46] Proceeding No. 2581, Tr. Vol. 3, October 9, 2013, page 533, lines 10 to 12.
[47] Proceeding No. 2581, Tr. Vol. 4, October 10, 2013, page 841, lines 15 to 24.

different generating units and by customers, the legislation did not eliminate differences in line loss factors. The review panel finds that what is efficient is what flows from the market model as designed and circumscribed by the legislation and regulations. In this case, the legislators have resolved that line losses are a cost to be borne by generating units and have expressly prescribed how they are to be determined and recovered. Clearly, it was the intention of the Legislature that the costs of line losses be a factor in determining competitive market outcomes. Thus, the extent to which line loss factors determined in accordance with the 2004 *Transmission Regulation* differ among generating units, and thereby have a bearing on market outcomes, must be presumed to be in furtherance of the efficient operation of the Alberta market. Indeed, legislators turned their minds to the question of the extent to which line loss factors should be permitted to differ in the Alberta market by placing limits in Section 19(2)(f) of the 2004 *Transmission Regulation* on how much above and below the system average line losses they could be. Therefore, the Commission does not consider the AESO's conception of the extent to which the 2005 Line Loss Rule should influence outcomes in the market to be relevant to the Commission's assessment of whether the 2005 Line Loss Rule complies with the 2003 *Electric Utilities Act* and the 2004 *Transmission Regulation*. Neither the AUC nor the AESO has the authority, under the legislative framework, to pursue a conception of efficiency that is different than that produced by the legislative framework.[48]

61. Milner and ATCO also argued for an approach to assessing the 2005 Line Loss Rule. They argued that the Commission should consider the significance of the requirement for location-based loss factors in assessing the 2005 Line Loss Rule. The word "location" appears in Section 19(1)(a) and in Section 19(2)(d). It also appears six other times in sections 19 to 22 of the 2004 *Transmission Regulation*. Milner stated that the purpose of location-based loss factors was to send a strong locational signal for potential investors. To support this contention Milner referred to the 2003 Transmission Development Policy which had stated that "the primary purpose of allocating losses to generating units was to act as an effective locational incentive."[49] ATCO stated that loss factors were intended to send the correct locational signal.[50] Conversely, the AESO and the Generator Group argued that the presence of the word "location" in sections 19 to 22 of the 2004 *Transmission Regulation* did not mean that the line loss rule contemplated by the regulation was required to send a strong locational signal. Instead, the AESO and the Generator Group argued that the intention of the legislators was that the line loss rule sends a strong dispatch signal.[51] The AESO acknowledged that the 2003 Transmission Development Policy emphasized that a loss factor was intended to send a strong locational signal for investment but argued that this was one of several parts of the 2003 Transmission Development Policy which did not find its way into the regulations.[52]

62. The review panel observes that neither the word "dispatch" nor the expression "dispatch signal" is included in sections 19 to 22 of the 2004 *Transmission Regulation*, whereas the word

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[48] Exhibit 486.01, Encana Argument, November 28, 2013, page 156, paragraph 378; exhibit 489.02, AESO Reply Argument, December 20, 2013, page 18, paragraphs 51 and 52.
[49] Exhibit 364.01, Milner Evidence of Dr. John MacCormack, July 19, 2013, page 11.
[50] Proceeding No. 2581, Tr. Vol. 9, October 18 2013, page 2028, lines 15 to 17.
[51] Proceeding No. 2581, Tr. Vol. 3, October 9, 2013, pages 531 and 532; and exhibit, 480.02, Generator Group Argument, November 27, 2013, page 49.
[52] Exhibit 320.02, AESO Evidence, May 27, 2013, page 17.

location appears eight times. The review panel is of the view, however, that the use of the word "location" and the absence of the word "dispatch" does not imply that the line loss rule should be designed specifically to send a strong locational signal for investment.[53] There is no need to consider the 2003 Transmission Development Policy in order to interpret the requirements of the 2004 *Transmission Regulation* or the 2003 *Electric Utilities Act* nor does the ISO or the Commission have the authority to assign to the word location greater significance than that contemplated in the legislative framework.

63. In the review panel's view, it is unnecessary to decide whether an investment signal or dispatch signal is to be preferred. The fact that the loss factor for each generating unit must be determined and maintained at each location anticipates that loss factors may be different at each location and the requirement that the ISO must determine a loss factor with respect to a generating unit that a person proposes to construct at a "place in Alberta where a generating unit is not located" means that locational signals for investment will be created by a line loss rule that complies with the 2004 *Transmission Regulation* and the 2003 *Electric Utilities Act*. In addition, the fact that the same loss factor will be incorporated into all prices offered by a generating unit in the market means that a dispatch signal will also be created, although the system controller will not necessarily know the loss factors nor be influenced by them. The review panel is of the view that all that is necessary is that the line loss rule comply with the words of the 2004 *Transmission Regulation* and the 2003 *Electric Utilities Act*. Whatever signals result, whether for investment or for dispatch, from such a rule will be what the legislators intended and will be efficient within the market structure set out in the legislation.

64. In accordance with the guidance provided by the Supreme Court of Canada in *McLean v British Columbia (Securities Commission)*, 2013 SCC 67 the Commission also considered whether the words used in sections 19 to 22 of the 2004 *Transmission Regulation* proved to be ambiguous once placed in their context and after considering the other indicators of legislative intent argued by the parties.

65. The review panel finds that there is no need in this case to resort to extrinsic evidence or the historical evolution of the market model including contents of various government documents such as the 2003 Transmission Development Policy, records of consultations about the 2004 *Transmission Regulation* or perceptions about what may have been the government's intentions when it enacted the 2003 *Electric Utilities Act* or proclaimed the 2004 *Transmission Regulation*. Neither the provisions of the 2003 *Electric Utilities Act* nor the 2004 *Transmission Regulation* under consideration in this proceeding were found by the review panel to be ambiguous or uncertain so as to justify seeking guidance outside of the words of the enactments that describe the market structure and the duties imposed on parties within it. It would not be consistent with the applicable rules of statutory interpretation to go beyond the words of the legislative provisions under consideration here in order to impute requirements that would impose further limitations (or expansions) of the language used in the 2004 *Transmission Regulation*.

[53] Exhibit 480.02, Generator Group Argument, November 27, 2013, page 16.

66. Therefore, the review panel will consider whether the line loss rule complies with the 2004 *Transmission Regulation* and the 2003 *Electric Utilities Act* without further recourse to extrinsic evidence.

4 Sections 19 to 22 of the 2004 *Transmission Regulation*

67. The review panel agrees with the AESO's characterization of the challenges in developing a line loss rule that complies with the many requirements set out in sections 19 to 22 of the 2004 *Transmission Regulation* and the legislation. The AESO states: "Accurately attributing line losses to a specific facility or group of facilities is very complex and there is no common industry calculation or methodology that can do this perfectly."[54] The review panel also acknowledges that there are likely a number of different ways that the regulation and statutory requirements for a line loss rule could be met. The Commission's role, as set out in Section 25(6)(b) of the 2003 *Electric Utilities Act* is to determine whether the 2005 Line Loss Rule is one of those ways by determining whether it is "unjust, unreasonable, unduly preferential, arbitrarily or unjustly discriminatory or inconsistent with or in contravention of the Act or the regulations."

4.1 Sections 19(1)(a) and 19(2)(d)

68. Sections 19(1) and 19(2) have different purposes. Section 19(1) deals with the costs of transmission line losses to be recovered from generating units and the means or mechanisms to be developed by the ISO in ensuring that the required amounts are collected. Section 19(2) deals with how loss factors are to be determined in accordance with the rules made under Section 19(1). Specifically, it states: "In accordance with the rules made under subsection (1), the ISO must determine loss factors having regard to" six prescriptive requirements. In the review panel's view, the provisions of Section 19(2) must be taken into account in developing the loss factors but only in a manner and to an extent that furthers the express purposes of and assists in realizing the outcomes specified in the rules to be implemented under Section 19(1). As Encana Corporation (Encana) points out, the determinations in Section 19(2) must accord with the requirements of Section 19(1).[55]

Reasonably recover

69. Section 19(1)(a) states that the ISO must make rules to "reasonably recover the cost of transmission line losses on the interconnected electric system by establishing and maintaining loss factors for each generating unit based on their location and their contribution, if at all, to transmission line losses."

70. The first issue is the meaning of "reasonably recover." The concept of reasonable recovery appears in sections 19(1)(a) and (c), as well as Section 21(1). In the review panel's view, reasonable recovery does not mean approximate recovery, as argued by the Generator

[54] Exhibit 293.01, AESO Argument, November 30, 2011, page 2, paragraph 1.3.
[55] Exhibit 486.01, Encana Argument, November 28, 2013, page 35, paragraph 76.

Group.[56] Rather, as argued by ATCO, it means recovery in a way that is reasonable having regard to the requirements of the 2004 *Transmission Regulation*.[57]

71. It is common ground among the parties to this proceeding that the actual amount of transmission line losses in a time period can be calculated precisely by subtracting the amount of electricity received by end-use customers from the amount of electricity delivered onto the system by generating units. [58] Similarly average system losses refer to the difference between total generation dispatched onto the system and total power drawn from the system (i.e., load) averaged over the time period being considered (i.e., the time period during which each line loss factor is to apply). [59] One cannot, however, directly measure how any one generator's output affects average or total transmission line losses. Instead, it is necessary for this to be estimated. [60]

72. Under the 2005 Line Loss Rule, the AESO employs three representative load profiles at four representative times during the year as the basis for estimating responsibility for losses for each generating unit at its location on the transmission system. No party suggested that the use of twelve representative load profiles was unreasonable. The 2005 Line Loss Rule ultimately determines a generating unit-specific loss factor at each location on the system by calculating a generating unit-specific loss factor for each of the twelve typical load profiles, and combining them to arrive at one number for each location as required by Section 19(2)(e). There were no concerns expressed by parties to the proceeding that the manner in which the 2005 Line Loss Rule averages the twelve raw (MLF/2) loss factors to arrive at the single raw loss factor number at each location was unreasonable. The review panel concludes that it is reasonable to use twelve representative snapshots as the basis for developing a single loss factor for each generating unit to be used in recovering each generating unit's contribution to total line losses in a year.

73. The expression "reasonably recover" or its equivalent, does not appear in Section 19(2)(d). Section 19(1)(a) requires that the ISO make rules to reasonably recover the cost of line losses by establishing loss factors based on a generating unit's contribution to transmission line losses. Section 19(2)(d) requires that the loss factors established under Section 19(1)(a) must also "be representative of the impact on average system losses by each respective generating unit." In other words, a loss factor that is representative of the impact of a generating unit on average system losses must also reasonably recover that generating unit's contribution to transmission line losses.

Contribution and impact

74. There was no consensus among the parties as to the meaning of the expression "contribution, if at all, to transmission line losses" found in Section 19(1)(a) and "impact on average system losses" found in Section 19(2)(d), of the 2004 *Transmission Regulation*. The Generator Group, for example, suggested during the hearing that there is a conflict between sections 19(1)(a) and 19(2)(d) in that Section 19(1)(a) implies a generating unit's contribution to

[56] Exhibit 480.02, Generator Group Argument, November 27, 2013, page 23.
[57] Exhibit 231.01, ATCO Power Reply Evidence, September, 15, 2011, page 4.
[58] Proceeding No. 790, Tr. Vol. 2, October 20, 2011, page 321, lines 7 to 10.
[59] Exhibit 204.01, Generator Group Written Evidence, July 28, 2011, pdf page 36.
[60] Proceeding No. 2581, Tr. Vol. 4, October 10, 2014, page 691 line 14 to page 692 line 4.

transmission line losses based on a fully allocated approach (to cost causation and recovery) whereas the word "impact" found in Section 19(2)(d) implies the use of a marginal approach (such as that adopted by the AESO).[61] ATCO, by comparison, saw no conflict in how the term "contribution" should be interpreted relative to the term "impact." In ATCO's view, "contribution" refers to each generator's *share* of total system losses[62] while "impact on average system losses" refers to the (total) line losses attributable to each generator's presence on the system averaged over the time period during which impact is being measured.[63] The AESO, meanwhile, saw no meaningful distinction in how "contribution" and "impact" should be interpreted within the context of sections 19(1)(a) and 19(2)(d) of the 2004 *Transmission Regulation*:

> A: (Mr. Stout) Sure. Ms. Buchinski, I will define "contribution" for you as I understand it in this context, and that is the "contribution" would be a fair allocation of the total cost of losses representative of the tendency of each generator to increase or decrease those total system losses.
>
> Q: And how would that definition differ from the wording used in 19(2)(d), which refers to impact on average system losses?
>
> A: (Mr. Stout) Very little. I don't think there is any use for distinction to be made between those two words in this context.[64]

75. Elsewhere in its testimony, the AESO interpreted the words "impact on average system losses" in a manner similar to that suggested by ATCO, that is, that a generating unit's impact on average system losses must be taken to mean the impact of the base load or typical dispatch (i.e., the average output) of that generator, as opposed to the impact of its last unit of output, on total system losses.

> A: (Mr. Stout) Before Mr. Mossing joins me in this response, Ms. Buchinski, I would just like to clarify one really important point here, which is marginal analysis by definition is the impact of the next megawatt hour on the system, in this case on the system losses.
>
> The impact of the base load or the typical dispatch of the generator on the total of system losses is not marginal, and I think in this discussion and methodologies I think we keep losing site (sic) of that. There's a marginal approach which is about X megawatt hour.
>
> But we're not being asked to find the impact of the last megawatt hour. We've been asked to find the impact of the generator on the average or total system losses, and that's a different issue. Please don't lose sight of that.[65]

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[61] Proceeding No. 2581, Tr. Vol 5, October 11, 213, page 930, line 17 to page 931, line 2.
[62] Exhibit 485.01, ATCO Power Argument, November 27, 2013, page 17, paragraph 49.
[63] Exhibit 485.01, ATCO Power Argument, November 27, 2013, page 10, paragraph 22.
[64] Proceeding No. 2581, Tr. Vol. 2, October 8, 2013, page 323, lines 3 to14.
[65] Proceeding No. 2581, Tr. Vol 2, October 8, 2013, page 326, line 13 to page 327, line 2.

76. The words "if at all", found in the expression "contribution, if at all, to transmission line losses" in Section 19(1)(a) are significant. It is common ground that each generating unit's energy must be transmitted across the transmission system and that a portion of all energy transmitted will be lost. Therefore, each generating unit will contribute to transmission line losses when operating and connected to the AIES. The use of the words "if at all" implies that the contribution of a generating unit might be zero. In order for a generating unit to contribute zero line losses, its presence on the system must have the effect of offsetting some losses produced by other generating units by exactly the same amount of losses it produces.[66] Therefore, contribution to transmission line losses must mean the net amount of the contribution. The net amount may be positive, zero or negative. Those generating units that cause more losses than they save are considered loss causers and those that save more losses on the system than they cause are considered loss savers. The possibility of a generating unit causing overall losses on the system to be higher or lower (thereby increasing or reducing overall losses) is recognized in the 2004 *Transmission Regulation* by the possibility of a generating unit having a loss factor of zero.

77. After considering the relevant provisions and overall scheme of the legislation and the 2004 *Transmission Regulation*, the review panel is of the view that "contribution" in Section 19(1)(a) of the 2004 *Transmission Regulation* means the extent, if any, to which each generating unit has added to or lowered total system line losses over the full range of its output over the time period under consideration. Contribution to line losses can be positive, negative or zero. A loss factor that is representative of the impact on average system losses for each generating unit or group of generating units relative to load, by comparison, is the single annual percentage charge or credit to be assigned and applied to each and every unit of output produced by each generating unit for the purpose of recovering from each such generating unit the costs of line losses that it imposes on the system, whether directly or indirectly.

Relative to load

78. Section 19(2)(d) requires that "the loss factor in each location must be representative of the impact on average system losses by each respective generating unit … relative to load." Average system losses means the difference between total generation and total load during the period under consideration. A number of parties to the proceeding either were unsure why "relative to load" was included in Section 19(2)(d) or thought it was superfluous.[67] In the review panel's view, the words do have a meaning. The process of determining a single loss factor for each generating unit by combining the results of the calculation of discrete loss factors relative to distributed load (as opposed to use of a generating unit's capacity relative to a swing bus, for example) in each of twelve base cases (as described above) is not inconsistent with the impact "relative to load" requirement.

Location on the transmission system

[66] There are two other conditions under which losses would be zero. One is if it is not operating, the other is if it is situated next to load and is connected directly to it (over a very short distance).

[67] Exhibit 482.02, AESO Argument, November 27, 2013, page 25.

79. A number of parties raised the issue of what constitutes location for the purposes of calculating loss factors. Section 19(1)(c) refers to "each location on the transmission system." Other references to location in the 2004 *Transmission Regulation*, such as in Section 19(2)(d), do not include the words "on the transmission system." The AESO insisted that location on the transmission system must be at the transmission bus. This interpretation was supported by the reference in Section 19(2)(d) to loss factors being determined for "each respective generating unit or group of generating units" since a group of generating units can only connect at a bus.[68] Milner argued that location on the transmission system could also be at the meter – the location where the energy dispatched from each respective generating unit is measured for all other purposes.[69] The review panel does not consider the 2004 *Transmission Regulation* to be so prescriptive as to limit the interpretation of location on the transmission system in a way that would preclude consideration of more than one approach to determining location on the transmission system for the purposes of complying with the requirements of the legislative framework.

4.2 Marginal analysis: locational and dispatch signals

80. It was accepted by all parties in this proceeding that the AESO's line loss methodology employs a marginal approach to determining each generating unit's impact on average system losses and contribution to total line losses. The AESO explained that a marginal approach to determining line loss factors, by definition, starts with a measure of the impact on average or total system losses of the last or marginal unit of output of each generator. The AESO conceded, however, that neither Section 19(1)(a) nor Section 19(2)(d) expressly prescribes or requires use of a marginal approach.[70] Mr. Stout explained that one of the reasons the AESO chose a methodology employing a marginal approach is because "it causes the least disturbance to your base load model of a realistic system dispatch incorporating all generating units and all loads".[71]

81. According to the AESO and the Generator Group, another reason supporting the AESO's adoption of a marginal approach is that it provides a better dispatch signal. Indeed, they argued that it was the intention of the legislators in setting out the requirements for the line loss rule that the line loss factors developed by the AESO facilitate efficient dispatch.[72] As the review panel has already noted, the line loss rule will send both the locational signal and dispatch signal intended if it complies with the legislative requirements. In any event, the review panel is not persuaded that a meaningful dispatch signal can be sent by any line loss factor consisting of a single number applied to every unit of output from a generating unit throughout the year regardless of the time of day, the season, conditions on the system or any other factors that could result in the marginal losses caused by the dispatch of various generating units varying significantly from time period to time period.

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[68] Exhibit 482.02, AESO Argument, November 27, 2013, page 24.
[69] Ibid. Exhibit 298.02, Milner Argument, November 30, 2011, pages 70 to 73.
[70] Proceeding No. 2581, Tr. Vol. 1, October 7, 2013, page 116, line 16 to page 118, line 13.
[71] Proceeding No. 2581, Tr. Vol. 1, October 7, 2013, page 116, line 16 to page 118, line 2 to 5.
[72] Proceeding No. 2581, Tr. Vol. 1, October, 7 2013, page 29, line 16 to page 30, line 2; exhibit 320.02, AESO Evidence, May 27, 2013, page 21; exhibit 480.02, Generator Group Argument, November 27, 2013, pages 17 and 18.

4.3 Line loss rule compared to requirements of sections 19(1)(a) and 19(2)(d)

82. The central issue in this proceeding is whether the AESO's line loss methodology complies with the requirements of Section 19(1)(a) and Section 19(2)(d) of the 2004 *Transmission Regulation*. In order for the Commission to find that it does, it must be satisfied that the AESO's MLF/2 methodology both (1) recovers the aggregate cost of industry line losses and (2) does so by allocating line loss costs among individual generating units in a manner consistent with the above-noted regulatory provisions. The first requirement (i.e., recovery of aggregate line losses) is readily verifiable and easily established. Moreover, the evidence submitted by all the parties to this proceeding was that all line loss methodologies considered by the AESO prior to its having selected the MLF/2 methodology would be able to meet the requirement of collecting total line losses.[73] The issue to be determined in this proceeding, therefore, can be distilled to whether the AESO's 2005 Line Loss Rule assigns to each generating unit a line loss charge or credit (i) based on each generating unit's overall contribution (either positive or negative) to total line losses on the AIES and (ii) that is representative of each generating unit's impact on average system losses relative to load.

83. In order to answer this question, the review panel considers that it would be helpful to supplement the description of its findings with a very high level, simplified illustration to assist in visualizing what the MLF/2 methodology's estimate of an increase or decrease in average system losses resulting from a small increase in the output of any given generating unit entails. The simple two-dimensional diagrams that follow below are offered for that purpose only and nothing else. In particular, they are not intended to serve as a representation of the full workings of, or the complex and interdependent physical relationships embedded in, the AESO's line loss methodology. Indeed, the diagrams below are not required to support the review panel's findings in this section, as those findings are based on facts already on the record of this proceeding.

84. The review panel understands that the curves represented in the three diagrams below, especially those in Diagrams #2 and #3, are limited to a point in time only. They are not intended to represent the relationship between an individual generator and line losses on the entire system over any extended period of time. Rather, the sole purpose of these diagrams is to illustrate the relationship between a single generator's output and changes in total system losses as a result of very small changes in the generating unit's output at a specific instant in time. It would not be realistic to assume that the diagrams below could be used to represent the effect on system wide line losses of significant changes in the output of a single generator over multiple periods of time.

Diagram #1

85. Diagram #1 is a simple representation of the AIES in which all demand (load) is supplied by a single generating unit. Industry power losses are characterized by a quadratic function of the form $L = aQ^2 + bQ + c$, where L represents line losses, *a*, *b* and *c* are constant real numbers and Q represents industry output in MW. The derivative of the power loss function with respect to generating unit output ($2aQ + b$, where $b = 0$) is the marginal line loss (MLL) function of the single generating unit. The MLL function is a straight line and can be drawn by plotting the slope

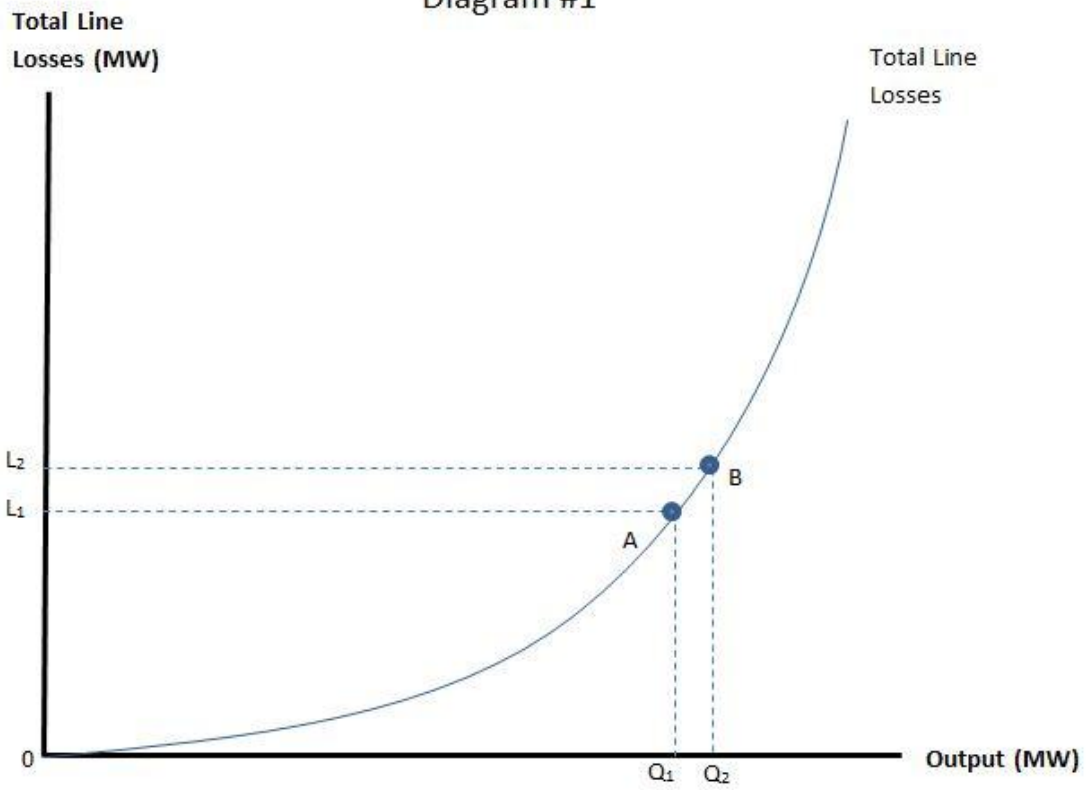
[73] Proceeding No. 2581, Tr. Vol. 4, October 10, 2013, page 817, lines 10 to 25.

of the tangent to the power loss (or total line loss) function at every point on that curve. Without loss of generality, the marginal line loss function can also represent the marginal cost function for the sole generating unit (assuming for the moment, that there are no other variable costs of production). At zero output, total line losses for the industry would be zero. Whenever $b = 0$, the MLL function for the sole generating unit would also be zero at zero output.

86. In the first scenario to be considered, assume that there is a small increase in demand for power. The single generating unit, which is assumed to have additional unused capacity, will increase its output to supply the increase in demand. The top curve in Diagram #1 shows that total system-wide losses will increase from L_1 to L_2 as the single generating unit's output rises from Q_1 to Q_2 to supply the increase in demand.[74] The MLL curve depicted at the bottom Diagram #1 shows that marginal line losses rise from MLL_1 to MLL_2, as output rises from Q_1 to Q_2. If industry prices were to be set at marginal cost (once again assuming for the time being that the only variable costs of production were the costs of line losses), then the price at which output Q_1 would be dispatched is MLL_1 and the price at which output Q_2 would be dispatched would be MLL_2. All parties to this proceeding agree that when line losses are a quadratic function of output (or, more correctly, a quadratic function of power flows), marginal cost pricing results in an over-collection of revenue. In the scenario depicted in Diagram #1, where line losses are zero at zero output, marginal cost pricing will result in an over-collection of the costs of losses by precisely a factor of two. This can be seen as follows. The area under the triangle $0CQ_1$ represents the total cost, in terms of line losses, of producing output Q_1 (this is because the area under a marginal cost curve represents total variable cost). It is the same quantum of total cost as that indicated by L_1 in the upper half of Diagram #1. Marginal cost pricing for line losses would result in charges represented by the rectangle $0MLL_1CQ_1$. The area of this rectangle is exactly twice that of the area of the triangle $0CQ_1$. The reason marginal cost pricing of line losses results in an over recovery of line loss costs is that the cost of the last unit produced exceeds the unit cost (measured solely in terms of line losses) of each preceding unit of output. When each successive infra-marginal unit of output costs more than the preceding unit of output, charging the same price for all units of output as the cost of the final unit cannot but result in an over recovery of costs. If the objective in this scenario were to limit cost recovery to only the total of line loss costs incurred, one method to accomplish this would be to set the price of all units of output at one half the cost of the last unit produced. That would be $MLL_1/2$ for output level Q_1 and $MLL_2/2$ at output level Q_2.

[74] Proceeding No. 2581, Tr. Vol. 2, October 8, 2013, page 290, lines 8 to 20.. These diagrams are visual representations of the small changes noted in the hearing transcript.

Diagram #1


Total Line Losses (MW)
Total Line Losses
L2
L1
B
A
0
Q1
Q2
Output (MW)

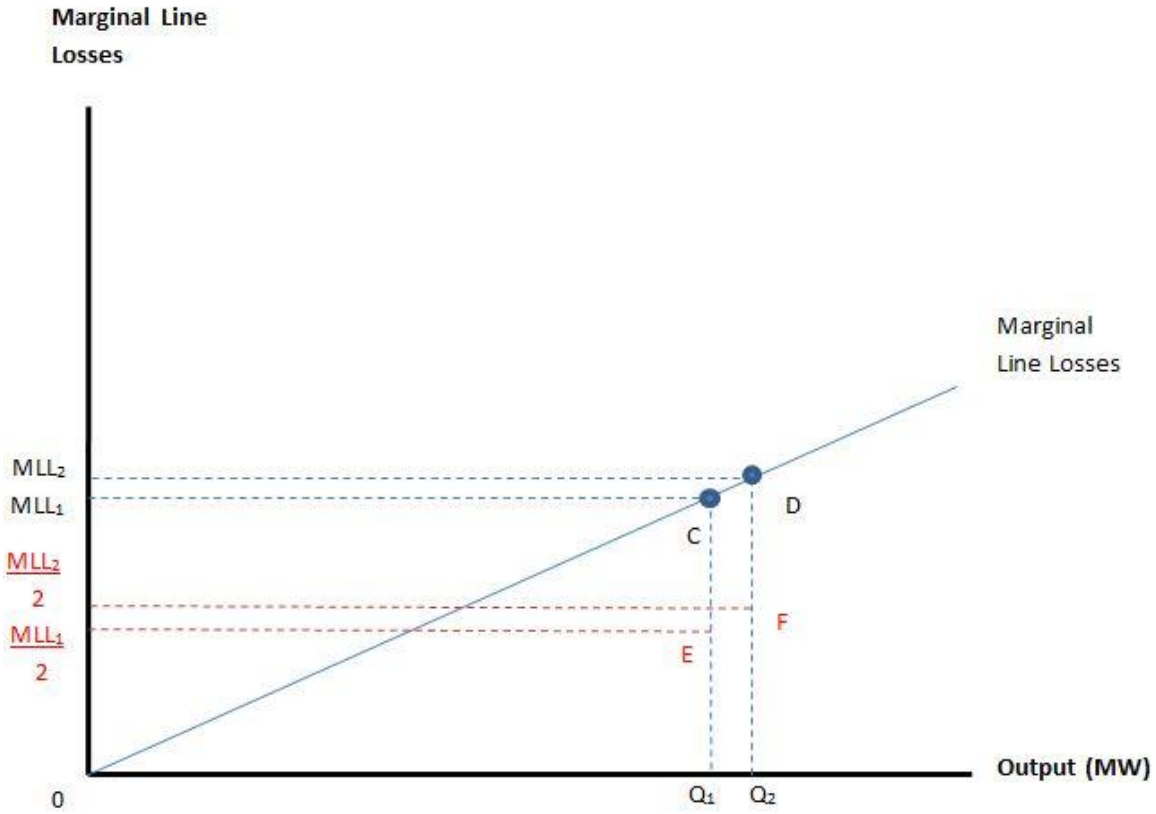

Marginal Line Losses
Marginal Line Losses
MLL2
MLL1
MLL2 / 2
MLL1 / 2
C
D
E
F
0
Q1
Q2
Output (MW)

Diagram #2

87. The second scenario to be considered involves a higher level of abstraction and, strictly speaking, cannot be fully captured, even for illustrative purposes, in a single diagram. This does not invalidate the observations being made (or, more accurately, the facts being described) since their validity does not depend on being able to depict them in a two dimensional diagram. The sole purpose of even attempting to rely on a diagram is to assist in visualizing the outcome of the AESO's line loss methodology in the scenario in question.

88. Diagram #2 portrays at a very high level what is being measured when the AESO estimates the change in total (and average) line losses for the entire system (comprising many generating units) occasioned by a small increase in the output of a single generating unit. The AESO's line loss methodology relies on four key assumptions in deriving raw line loss factors for each generating unit on the system, namely, that:[75]

- the generating unit for which the loss factor is to be evaluated is going to supply the next increment in load on the AIES;
- the generating unit for which the loss factor is to be calculated becomes the swing bus for the transmission system;
- every load within the AIES [will] be increased by a common factor and a loss gradient [will] be determined for the generating unit equal to the total change in system losses divided by the change in output of the generating unit for which the loss factor is being calculated; and
- the raw loss factor for the generating unit is set equal to ½ the gradient.

In other words, the AESO's model balances the load on the system when it estimates the changes in total line losses conceptually resulting from a slight perturbation in the output of a single generating unit. The output of all other generating units on the system is held constant, both individually and collectively, as part of this calculation. It is important to observe, however, in this conceptual exercise, that flows throughout the system are almost certain to change once the output of the given generating unit is increased to satisfy the marginal increase in demand.

89. The u-shaped curve in the upper half of Diagram #2 represents the change in system-wide line losses for a slight increase in the output of a single generating unit. Strictly speaking for the generating unit in question, a new u-shaped curve and new marginal line loss curve would be necessary to represent any level of output other than the very narrow range being considered in each scenario. For purposes of this scenario, the generating unit in question (Generator A) is assumed to be operating initially at output Q_1. At this level of output, it can be seen that Generator A is operating on the left-hand side of the u-shaped total line loss curve. This means that a small increase in the output of Generator A, while holding every other generating unit's output constant, will lead to a reduction in overall system line losses. This is depicted by the marginal increase in its output from Q_1 to Q_2 and the corresponding decline in total system line losses from L_1 to L_2. In these circumstances, Generator A is a line loss saver. It has reduced total

[75] Exhibit 133.03, ATCO Power Evidence, April 14, 2011, Attachment 4, pages 13 and 14.

system line losses by displacing output previously being dispatched from one or more generating units elsewhere on the system that was associated with higher line loss costs. In other words, despite having non-negative "own line losses" associated with the transmission of its marginal increase in output, Generator A displaced output from elsewhere on the system that entailed even higher line losses, thus reducing total and average line losses in its move from Q_1 to Q_2.

90. Next, assume that Generator A's initial level of output is Q_3 instead of Q_1. (Implicit in this assumption is the additional assumption that the same u-shaped curve will still represent Generator A's circumstances notwithstanding that circumstances on the rest of the system will be different relative to what they were when Generator A was producing output in the range between Q_1 and Q_2). Were the AESO to estimate Generator A's impact on average system losses by employing its line loss methodology to simulate a marginal increase in its output from Q_3 to Q_4, the result in the present circumstances would be a further reduction in system-wide losses, but by a much smaller amount. The difference between L_3 and L_4 is much smaller than the difference between L_1 and L_2. All this is saying is that the amount by which Generator A is reducing total and average system losses declines with each additional unit of output it produces over the range of output from zero to Q_4. (Once again, this cannot be depicted in a single diagram as, strictly speaking, the curves shown in Diagram #2 only apply to a very limited range of output for Generator A at any point in time). Any further increases in the output of Generator A beyond Q4 will start adding to total and average system losses. This is even more clearly visible when considering the marginal line loss curve depicted at the bottom of Diagram #2.

91. As before, the marginal line loss curve can be derived mathematically from the total line loss curve. Industry power losses, as a function of the output of Generator A, are characterized by a quadratic function of the form $L = aQ^2 + bQ + c$, where L represents line losses, *a*, *b* and *c* are constant real numbers and where $a, c > 0$ and $b < 0$ and Q represents Generator A's output in MW. The marginal line loss curve in Diagram #2 depicts changes in total line losses resulting from a marginal increase in the output of Generator A. Consider the reduction in marginal line losses from MLL_1 to MLL_2 attending a marginal increase in output of Generator A from Q_1 to Q_2. In this scenario, Generator A will reduce total line losses by L_1 minus L_2.or, equivalently, by the area of the trapezoid FQ_1Q_2G. Were Generator A initially operating at output Q_3 instead, and its output were increased to Q_4, the reduction in total line losses would equal the difference between L_3 and L_4 or the area of the triangle HQ_3Q_4.

92. By the time Generator A reaches output Q_4, its contribution to total line loss savings is maximized. The measure of these savings is the area of the triangle $0Q_4MLL_0$. It should also be noted that the positive externalities Generator A is responsible for increase at a declining rate between 0 and Q_4.

93. Several interesting attributes of the treatment of line loss savers by the AESO's 2005 Line Loss Rule can now be considered. First, note that at any level of output for a generating unit that is still adding to system-wide line loss savings, the marginal line loss saving of the last unit of output is smaller than the marginal saving produced by the immediately preceding unit of output. Thus, Q_1F is larger than Q_2G which is larger than Q_3H. This progression is exactly the opposite of what occurs when line losses are being created. That is, each succeeding unit of output for a loss causer adds more to total line losses on the system than the previous unit of output. And just as this phenomenon explains the over-recovery of line loss costs when line

losses are priced at marginal cost, it also explains why marginal cost pricing of line losses results in under-recovery or under-compensation for line loss savings. This can readily be seen by examining the total area of savings at output Q_2, namely, the trapezoid, $0Q_2GMLL_0$. Pricing the line loss savings at marginal cost (or at MLL_2 in Diagram #2), however, would result in recovery of only the area of rectangle $GMLL_20Q_2$. The area represented by the triangle MLL_0MLL_2G would not be credited to Generator A. In addition, under the AESO's MLF/2 methodology, the under-compensation or under-recovery of line loss savings is further magnified. As shown in Diagram #2, were Generator A to be operating at output Q_2, it would receive a total credit based on the area $(MLL_2/2)0Q_2J$ which is less than half of the positive externality it has created.

94. The under-recovery or under-compensation for positive externalities created by loss savers is greater, the closer is their output to that level at which positive externalities are maximized. In Diagram #2, if Generator A were operating at output Q_3, its total contribution to line loss savings would be the area $0Q_3HMLL_0$, yet the credit it would receive for these savings under a regime of marginal cost pricing of line losses would be the narrow rectangle $0Q_3HMLL_3$ and only half that amount were it to be compensated based on the AESO's MLF/2 methodology. Generator A maximizes positive externalities (in terms of line losses saved) at output Q_4. Yet, at that level of output, the credit it would receive for creating those positive externalities is zero, whether the credit is based on an MLF or an MLF/2 methodology. This is because at output Q_4 Generator A's marginal line loss is zero. That is, in the limit, just as its output approaches Q_4, Generator A will neither be adding to line losses nor to loss savings. In this circumstance, no portion of the line losses saved by Generator A over the full range of its output from zero to Q_4 will be credited to it by the AESO's 2005 Line Loss Rule. The full quantum of these line loss savings depicted by the area bounded by MLL_00Q_4 will constitute what can be described as "unattributed savings" under the AESO's 2005 Line Loss Methodology.

95. In general, the AESO's MLF/2 loss factor that savers receive declines monotonically from 50 per cent in the limit as output approaches zero to zero per cent in the limit as their output approaches the point at which their contribution to line loss savings is maximized. One implication of this is that line loss savers may be treated differently as between themselves with respect to the savings they create. A line loss saver producing a greater positive externality than another line loss saver may well find that the proportion of the benefits it creates that is attributed to it as a credit is actually lower than the credit received by a line loss saver responsible for creating a smaller positive externality.

Diagram #2

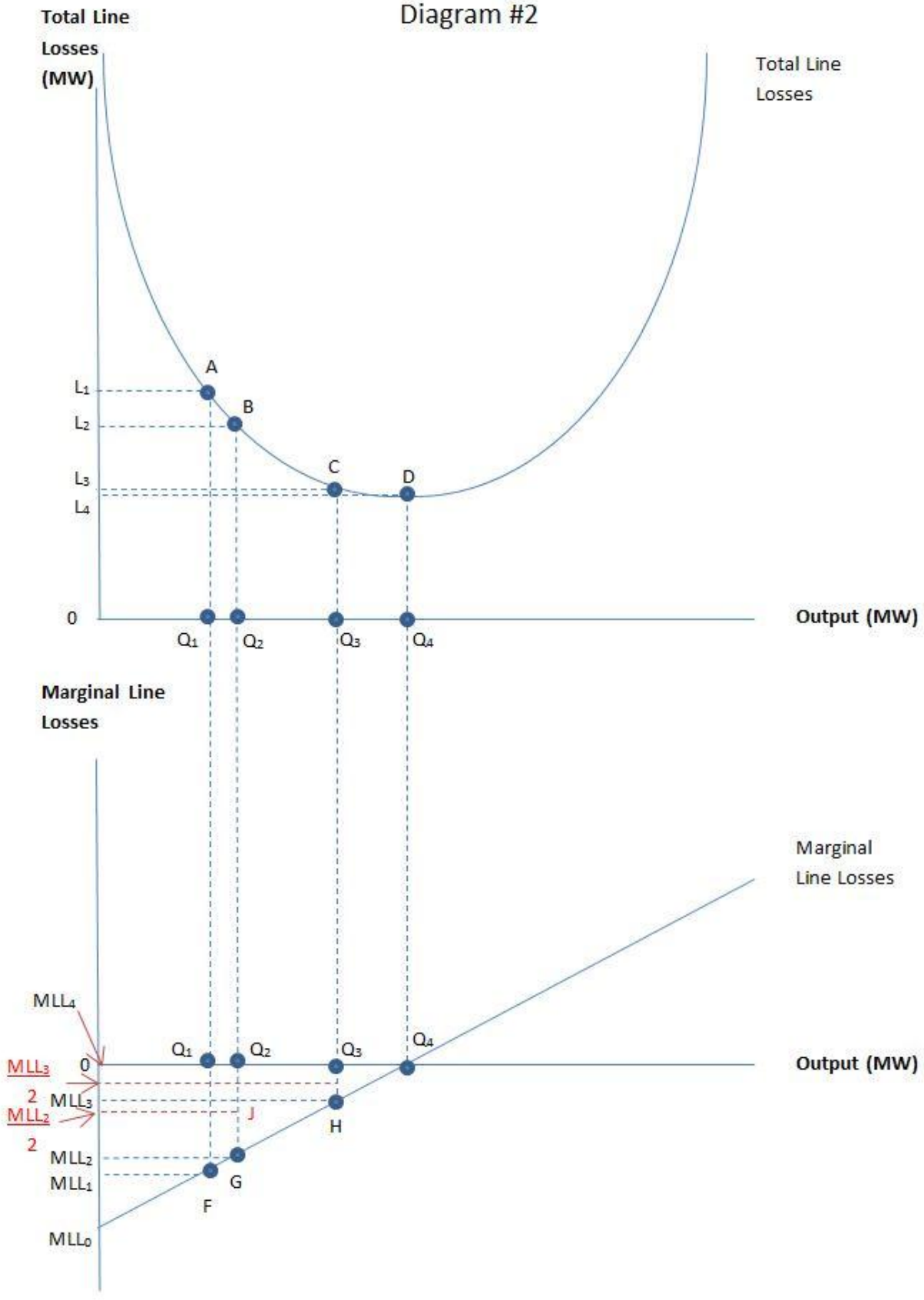

Total Line Losses (MW)
Total Line Losses
A
B
C
D
L1
L2
L3
L4
0
Q1
Q2
Q3
Q4
Output (MW)
Marginal Line Losses
Marginal Line Losses
MLL4
MLL3
2
MLL3
MLL2
2
MLL2
MLL1
MLL0
J
H
G
F
Output (MW)

Diagram #3

96. Diagram #3 is very similar to Diagram #2, except that it illustrates a different set of circumstances in terms of how line loss savers are treated by the AESO's 2005 Line Loss Rule. Consider a generating unit (Generator A) operating at output level Q_4. As was seen in Diagram #2, such a generating unit would be assigned a line loss factor of zero and its unattributed or unassigned line loss savings would be equal to the area of the triangle $0Q_4MLL_0$. If the AESO, relying on its 2005 Line Loss Rule, were then to calculate the effect of a slight increase in Generator A's output from Q_4 to Q_5, the result would be that Generator A would be assigned a positive line loss factor based on one half the vertical distance between G and Q_5 (equal to $MLL_5/2$). This is because the marginal or last unit of output for Generator A would be causing line losses in excess of the average line losses for the system. Put differently, if dispatched, Generator A's last unit of output would displace output from elsewhere on the system that is associated with slightly lower line losses. The AESO's 2005 Line Loss Rule, however, would treat every single unit of Generator A's output from 0 to Q_5 as adding to total line losses or, equivalently, as raising system-wide average line losses, notwithstanding that it is only the last unit of Generator A's output that has this effect. The review panel notes, in this regard, that this scenario is conceptually equivalent to that described by the majority in Decision 2012-104 when it spoke of the water reservoir analogy. Conceptually, the water reservoir alluded to by the hearing panel is the area of unattributed line loss savings depicted by the triangle $0Q_4MLL_0$ in Diagram #3.

97. In Diagram #3, were Generator A instead operating at a level of output just slightly lower than Q_6, it would be approaching the point at which each successive unit of its output were adding to average system losses to such an extent that it will have offset all infra-marginal line loss savings it is contributing to the system. By the time Generator A reaches output level Q_6, its net contribution to total line losses on the system is zero. At this point, the AESO's 2005 Line Loss Rule will assign to Generator A a line loss charge equal to one half the marginal loss factor at output Q_6.

98. The review panel notes one further asymmetry in the treatment of line loss savers versus line loss causers by the AESO's 2005 Line Loss Rule. The failure of the AESO's 2005 Line Loss Rule to assign or attribute to line loss savers the full measure or benefit of the line loss savings they contribute to the system means that the unattributed or unassigned savings must be "socialized" or allocated to the benefit of all generating units. In other words, the line losses attributed to loss causers must, by definition, be lower than they would otherwise be by virtue of the reduction in average (or total) system line losses resulting from the actions of line loss savers.

99. A useful summary of the AESO's views on how line loss savings are created and how credit for those savings is assigned to different generating units under its 2005 Line Loss Rule can be found in the AESO's responses to the comments submitted by various parties during the industry-wide consultations that ultimately led to the adoption by the AESO of the MLF/2 line loss methodology.[76] The AESO, for example, makes it clear that the locational decisions made by generators are an important driver of line loss savings on the AIES. In particular, whenever new

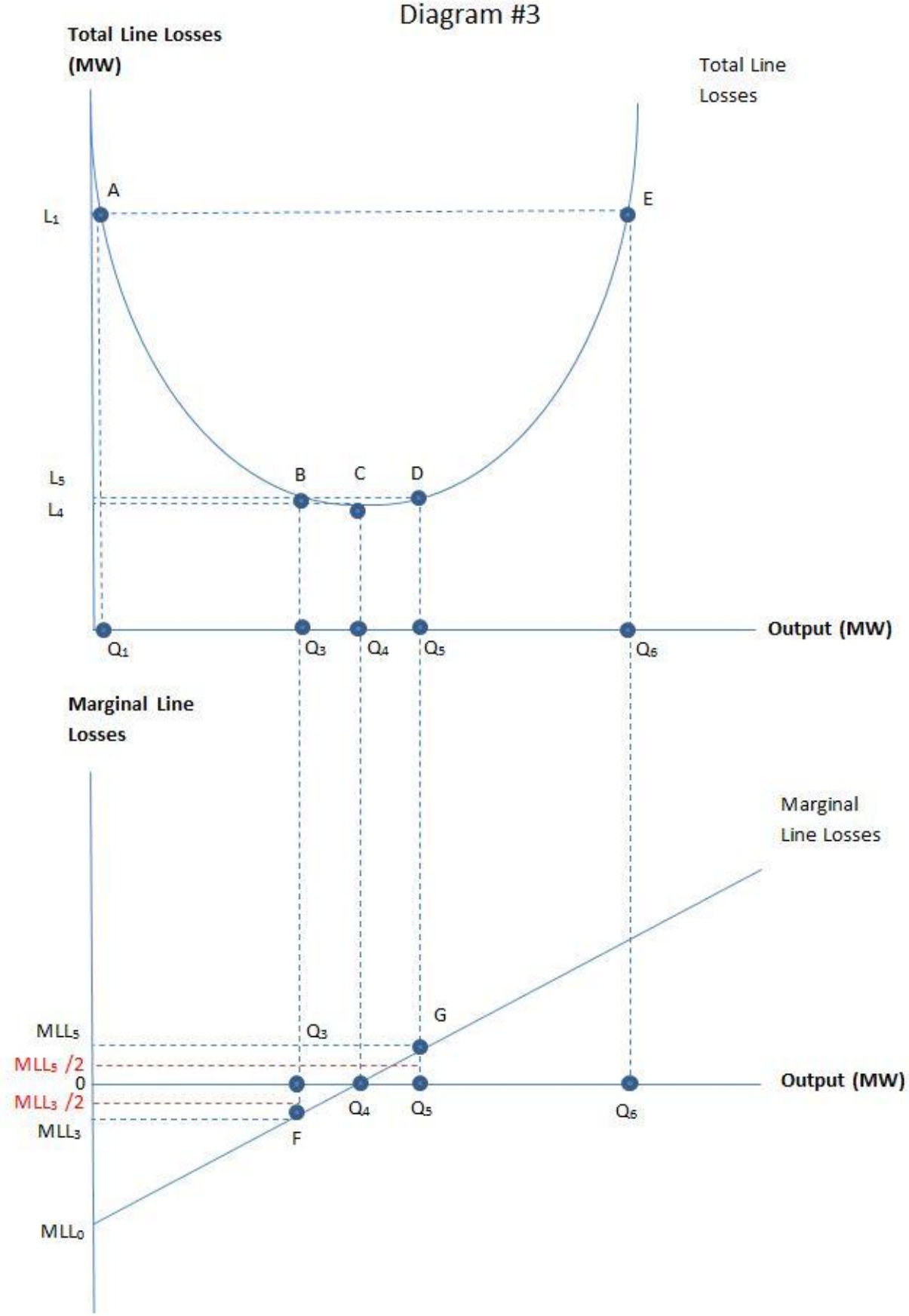
[76] Exhibit 133.03, ATCO Power Evidence, April 14, 2011, Attachment 4.

generation is located close to a load centre, provided that the new generation capacity does not exceed the load at that load centre, line loss savings will result.[77] Savings are created because the output from the generating unit that located close to the load centre is associated with lower line losses than the output from elsewhere on the system that previously met the demand for power at that load centre. According to the AESO, however, credit for the reduction in line losses resulting from the locational decision of the generator in question should be apportioned among all generating units on the system in relation to their capacity, rather than being attributed in full to the generating unit now supplying (some or all of) the load in close proximity to it. In the AESO's view, this outcome is justified on the ground that "as all generators were originally being charged for losses, all generators will also share the credit for the loss reduction."[78] The AESO's 2005 Line Loss Rule, in other words, allocates to line loss causers what the review panel has described in Diagrams #2 and #3 as the "unattributed savings" of the generating unit responsible for all of the line loss savings in question. This amounts to a socialization of the positive externalities that are created whenever new generating units lower average system losses by locating close to load. It also diminishes the competitive advantage (in terms of lower line loss costs) that would otherwise accrue to generating units making efficiency-enhancing locational decisions.

100. A final finding not illustrated here, but addressed in the evidence of Milner's expert witness, Dr. MacCormack,[79] is a mathematical proof regarding the general quadratic function of the form $Y = aQ^2 + bQ + c$, where Y represents line losses, a, b and c are constant real numbers and Q represents a generating unit's output in MW. The proof demonstrates that, except in the seldom, if ever, encountered circumstance in which the marginal loss factor at zero output is zero for each generating unit, the AESO's MLF/2 methodology will systematically undercharge or under collect the costs of line losses for which loss causers are responsible and under compensate or insufficiently credit line loss savers for the savings they contribute. This situation will arise whenever the marginal loss factor is greater than zero at zero output for loss causers and where the marginal loss factor is less than zero at zero output for line loss savers.

[77] Exhibit 133.03, ATCO Power Evidence, April 14, 2011, Attachment 4, pages 51 to 52.
[78] Exhibit 133.03, ATCO Power Evidence, April 14, 2011, Attachment 4, page 51.
[79] Exhibit 364.06 Milner, Evidence of John MacCormack PhD. P.Eng, July 19, 2013, Appendix A, pages 42 to 50.

Diagram #3


Total Line Losses (MW)
Total Line Losses
A
E
L1
B
C
D
L5
L4
Output (MW)
Q1
Q3
Q4
Q5
Q6
Marginal Line Losses
Marginal Line Losses
G
MLL5
Q3
MLL5 /2
0
MLL3 /2
MLL3
F
Q4
Q5
Q6
Output (MW)
MLL0

4.4 Line loss limits or collars

101. The 2004 *Transmission Regulation* places upper and lower bound limits on the loss factors that any generating unit can be assigned by the AESO's 2005 Line Loss Rule, which in this proceeding have been referred to as collars. Section 19(2)(f) provides that loss factors associated with a charge cannot exceed two times the average system loss factor, while loss factors associated with a credit cannot exceed one times the average system loss factor. If the average transmission system loss factor were 5 per cent, this would mean that no charge could exceed 10 per cent and that no credit could exceed -5 per cent. This is the same as saying that no charge could be more than 5 percentage points higher than the system average loss factor and that no credit could be more than 10 percentage points below the average system loss factor.

102. The existence of statutorily prescribed limits on the applicable range of line loss factors constrains the AESO's ability to assign line loss factors commensurate with each generating unit's contribution to average system losses. The generating units most advantaged or disadvantaged by the existence of the collars prescribed by the 2004 *Transmission Regulation* are those whose individual contribution to total (and average) system line losses would otherwise result in the assignment to them of credits or charges that lie outside the prescribed collars.

103. According to the AESO, one of the principal benefits of its MLF/2 line loss methodology is that, on an aggregate basis, it avoids the over-collection of line loss costs.[80] Avoiding over-collection, however, entails a compression in the spread or dispersion of loss factors based on MLF alone. The AESO concedes that such compression results in a narrowing of the absolute distance between line loss factors calculated for each generating unit and correspondingly reduces the absolute cost advantage that loss savers would otherwise maintain relative to loss causers.[81] The AESO notes, however, that its reliance on MLF/2 at no time affects the relative ranking or ordering of line loss factors assigned to different generating units.[82] Thus, while compression reduces the absolute cost advantage of a loss saver relative to a cost causer, it still leaves cost savers with a competitive advantage (albeit a diminished one) relative to cost causers.

104. In reviewing the actual loss factors assigned to each generating unit in Alberta over the three year period 2006-2008, the review panel found that in only two cases in two years, involving the same two generating units, did an assigned credit or charge precisely equal a line loss factor limit. This suggests that MLF/2 is an effective means of bringing most outliers inside the collars, leaving the few remaining extreme outliers to be brought to the collar limits via a different mechanism, such as clipping or shifting.

105. The actual steps taken by the AESO to ensure that the line loss factors it assigns to individual generating units not only fall within the collars established by Section 19(2)(f) but still result in the collection of forecast line losses in the aggregate, are succinctly summarized at page

[80] Exhibit 482.02, AESO Argument, November 27, 2013, page 10.
[81] Proceeding No. 2581, Tr. Vol. 4, October 10, 2013, page 623, lines 18 to 24.
[82] Exhibit 482.02, AESO Argument, November 27, 2013, page 8.

74 of Alberta Electric System Operator 2006 Transmission Loss Factor Methodology Decision Document, under the heading Compressed Loss Factors.[83]

106. The AESO has identified that if a situation does arise where compression is necessary, the following methodology will be adopted:

- The loss factors of all generating units outside of the valid range (loss factor envelope of three times system average losses) will be limited to the valid range by clipping, and
- A shift factor will be applied to the loss factors for all generating units not on the loss factor limit with the first calculation to balance the energy loss.

107. If any loss factors lie outside the range as a result of application of the shift factor:

- the loss factors of all of the generating units that were not originally on the loss factor compression limits(clipped) would be 'linearly compressed'
- the difference between the shifted loss factor and the system average loss factor would be multiplied by a constant factor and the result added to the average loss factor to ensure that all loss factors are within limit; and
- the final loss factor will be referred to as a 'compressed' loss factor.

108. The review panel understands the above to mean that, in the AESO's view, the requirements of the 2004 *Transmission Regulation* in Section 19(1)(a) generally, and Section19(2)(f) in particular, are best met by first resorting to clipping, then the use of shift factors and finally compression, only if still required. An issue that arose in this proceeding was whether and to what extent the AESO had authority to employ clipping and shifting in order to bring line loss factors within the collars. The review panel considers that Section 19(2)(f) does not preclude the use of clipping and shifting prior to the compression contemplated in Section 19(2)(f), nor does it preclude the use of compression to determine raw loss factors prior to clipping or shifting. For this reason the Commission finds it unnecessary to deal with the legal effect of the response from the Department of Energy to the AESO's request to use an alternative technique to bring loss factors within the collars.

4.5 Line loss credits

109. In AUC-AESO-2[84] the Commission requested a clarification from the AESO as to the meaning of the term "credit" in the context of line loss factors. The AESO responded, in part, as follows: "(I)n the context of contributions to system losses, the term 'credit' means only that the contribution to losses is less than the average (This is distinct from the accounting sense of "credit", which signifies a change in sign from "debit"). For example, if the system average loss factor were 5 per cent, any loss factor that is less than this would be a credit. A generator with a

[83] Exhibit 133.03, ATCO Power Evidence, April 14, 2011, Attachment 4.
[84] Exhibit 343.02, AESO IR Response, June 27, 2013, page 4.

3 per cent loss factor would be viewed as getting a 2 per cent credit. In this context, the marginal loss factor "MLF"/2 approach would result in a credit where the generator contribution is zero, which is of course, less than average."

110. Assuming that average system line losses are 5 per cent, the review panel takes from this response that the compensation scheme below would apply to any generating unit required to deliver 100 MW to meet load were its assigned marginal loss factor to be as follows:

MLF/2 Line Loss Factor	MWs Generated	MWs Paid for by AESO
10%	100	90
5%	100	95
0%	100	100
-5%	100	105

111. The review panel agrees that under the AESO's definition of what constitutes a "credit", a generating unit assigned a zero line loss factor would receive a 5 per cent credit or benefit relative to the system average for all units of output that it delivers to customers.

5 Conclusion

112. The review panel has considered carefully the evidence regarding how the 2005 Line Loss Rule operates and finds that it does not comply with Section 19(1)(a) and Section 19(2)(d) of the 2004 *Transmission Regulation* and Section 25(6)(b) of the 2003 *Electric Utilities Act*.

113. In both its evidence and argument, the AESO's position has been that its MLF/2 line loss methodology meets the requirements of the 2004 *Transmission Regulation* because it both correctly recovers the costs of aggregate line losses and charges each generating unit "according to its representative impact on average system losses."[85] According to the AESO, "MLF/2 is the most reasonable estimate" of the impact on average system losses to be determined pursuant to Section 19(2)(d) of the 2004 *Transmission Regulation*:

> MLF/2 is not half the representative impact; MLF/2 is *the* representative impact. It correctly allocates to each generator that generator's representative share of a pool of losses and does not over-allocate losses to any generator. [italics in original] [86]

114. The review panel is not persuaded by the AESO's assessment that MLF/2 is *the* representative impact of each generator on average system losses. During the hearing, the AESO admitted that it has no way of knowing whether MLF (and, hence, MLF/2) over collects or under collects line losses at the level of each individual generating unit.

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[85] Exhibit 489.02, AESO, Written Reply of the AESO, December 20, 2013, page 26.
[86] Exhibit 482.02, AESO, Written Argument of the AESO, November 27, 2013, page 9.

> Q. When you are talking about the over-collection arising from MLF…
>
> A. (Mr. Mossing): Yes.
>
> Q. ….is it an over-collection on a global basis for all generators?
>
> A. (Mr. Mossing): The sum of all the marginal calculations, so for 193 generators on the system, the sum of all of the change in losses for the small increment of generation results in an over-collection by 100 per cent so…
>
> Q. Right. On a global basis; Correct?
>
> A. (Mr. Mossing): Yes.
>
> Q. Does MLF, then, also result in an over-collection on an individual generator basis for each generator?
>
> A. (Mr. Mossing): We don't know. We don't have the right answer. Marginal is just an estimate of what the change in losses are for that small increment or margin, and so we don't know. [87]

115. The AESO's characterization of how the 2005 Line Loss Rule satisfies the legislative requirements focusses on Section 19(2)(d) and does not address Section 19(1)(a). The review panel recognizes that the AESO does not see much difference between the requirements of Section 19(1)(a) and 19(2)(d). In addition, the AESO has consistently stated that a marginal approach is what best captures impact within the meaning of Section 19(2)(d). The review panel, however, has found that Section 19(2)(d) must be interpreted to accord with Section 19(1)(a), which requires that the ISO maintain loss factors for each generating unit based on their contribution, if at all, to transmission line losses. In the review panel's view, and as explained in section 4.1 above, Section 19(1)(a) requires recognition of the effects of the full range of a generating unit's outputs. A generating unit should, therefore, receive the full benefits of the system loss savings caused by its operations.

116. There was considerable evidence presented by parties to the proceeding on the operation of the line loss rule, demonstrating that the AESO's MLF/2 methodology does not attribute to line loss savers the full measure of savings they are responsible for having created.[88] As noted earlier, the AESO itself confirmed that a portion of the line loss savings that arise when a generator locates close to load and produces up to but not beyond the output required to meet that local load (referred to above as the "unattributed savings") is treated by the 2005 Line Loss Rule as a benefit to be shared by all generating units rather than being credited in full to the generating unit causing those savings. As a consequence, the loss factors assigned to loss causers are lower than they would otherwise be given the losses they have created.

117. The AESO also explained that credit for the reduction in line losses resulting from the locational decision of a generator in question will be apportioned among all generators on the

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[87] Proceeding No. 2581, Tr. Vol. 2, October 8, 2013, page 328, lines 4 to 20.

[88] This is the thrust of the position from ATCO and Milner.

system in relation to their capacity, rather than being attributed in full to the generator now supplying (some or all of) the load at the local load centre.[89] The fact that the 2005 Line Loss Rule distributes some loss savings to loss causers who have not contributed to loss savings is arbitrary and means that the principles of cost causation have been violated.

118. As noted above, the AESO considered this distribution of loss savings to be justified on the ground that "as all generators were originally being charged for losses, all generators will also share the credit for the loss reduction."[90] In the review panel's view, this reason cannot justify the AESO's decision to distribute the savings as it has done. This is so because, as discussed above, Section 19(1)(a) requires a measure of "contribution, if at all" that includes a measure of the full value of both losses caused and losses saved by a generating unit. The AESO's MLF/2 methodology does not meet this requirement. Failure to meet this requirement results in an undue preference being granted to loss causers and an unjust discrimination against loss savers.

119. The AESO's 2005 Line Loss Rule also does not distinguish between generating units that add to total and average line losses at every level of their output and generating units that remain net contributors to total and average line loss savings despite having commenced adding to total and average line losses only with their last (marginal) unit(s) of output. Whenever this situation occurs, the AESO's 2005 Line Loss Rule will treat differently generating units adding the same net amount to line loss savings. One of these generating units will receive a credit under the AESO's 2005 Line Loss Rule for every unit of its output, and the other will receive a charge for every unit of its output.

120. All parties agree that if MLF (0) = 0, the AESO's 2005 Line Loss Rule would comply with both Section 19(1)(a) and Section 19(2)(d) of the 2004 *Transmission Regulation*. Each generator's MLF/2 loss factor multiplied by the output at which it was calculated, would produce a result closely approximating its contribution to total line losses over the period being considered. However, as was equally recognized by all parties to this proceeding, few, if any, generating units ever have a marginal loss factor of zero commencing with their first unit of output. As a result, as explained more fully above, MLF/2 will systematically under collect the costs of line losses attributable to cost causers and under compensate or over collect from line loss savers.

121. To summarize, for the reasons given in this decision, the review panel concurs with the hearing panel's finding that the AESO's MLF/2 line loss methodology does not comply with sections 19(1)(a) and 19(2)(d) of the 2004 *Transmission Regulation* because the AESO's 2005 Line Loss Rule fails to assign to each generating unit a line loss charge or credit (i) based on each generating unit's contribution to transmission line losses and (ii) that is representative of each generating unit's impact on average system losses relative to load. As the majority stated in Decision 2012-104, the MLF/2 methodology is unjust because it disadvantages loss savers and

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[89] Exhibit 223.02, AESO 2006 Transmission Loss Factor Methodology Decision Document, September 6, 2011, page 51.

[90] Exhibit 223.02, AESO 2006 Transmission Loss Factor Methodology Decision Document, September 6, 2011, page 51

does not properly charge loss creators for their losses.[91] It is also "unjustly discriminatory as it violates all the principles of rate design that would normally be observed in a regular rate or tariff proceeding."[92]

122. The review panel's reasons for confirming the two principal findings of the hearing panel are that the AESO's 2005 Line Loss Rule systematically over-charges (or under-compensates) line loss savers for their contribution to line loss savings and under-charges loss causers for the costs of line losses they impose on the transmission system. In addition, the line loss rule allocates a portion of the savings attributable to line loss savers to the benefit of line loss causers. The AESO's 2005 Line Loss Rule also treats similarly situated generating units differently without cause or justification. In particular, rather than rewarding line loss savers for continuing to lower average system losses, the greater are the savings created, the lower is the credit awarded as a proportion of the total savings produced. As a result, generating units responsible for lower total contributions to line loss savings will receive proportionately larger credits than generating units responsible for greater line loss savings.

123. The review panel also finds that the 2005 Line Loss Rule is inconsistent with achievement of the objective in Section 5(c) of the *Electric Utilities Act* in that it results in unfair advantages being conferred upon one set of generating units (line loss causers) relative to other generating units (line loss savers), thereby distorting the market for electricity and the structure of the Alberta electric industry.[93]

124. For all of the above reasons the review panel finds, pursuant to Section 25(6)(b) that the AESO's 2005 Line Loss Rule is unjust, unreasonable, unduly preferential, arbitrarily or unjustly discriminatory or inconsistent with or in contravention of the 2003 *Electric Utilities Act* or the regulations.

6 Other grounds for review

125. In Decision 2012-104 there is a finding at paragraph 116 "that an ILF methodology, and not the MLF or MLF/2, is what complies with the 2004 *Transmission Regulation* and the legislative framework discussed earlier regarding lumpy recovery of line losses." It appears that this ruling was intended to be applicable beyond 2008.

126. The hearing panel made an additional finding at paragraph 6 of Decision 2012-104 that "the AESO Line Loss Rule as it exists today 'does not support the fair, efficient and openly competitive operation of the market' and that the 2005 Line Loss Rule 'is not in the public interest.'" This finding also appeared at paragraph 120 of Decision 2012-104 where the hearing panel held that "Milner's complaint would also be valid, were it complaining about the line loss rule post 2008."

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[91] AUC Decision 2012-104, April 16, 2012, page 21, paragraph 94.
[92] AUC Decision 2012-104, April 16, 2012, page 21, paragraph 95.
[93] The "impugned Encana argument and reply argument" referred to in the Commission's January 28, 2014 letter (exhibit 502) and ENMAX's regression analysis referred to in Decision 2012-104 were given no weight and did not inform any of the review panels findings in this proceeding.

127. In Decision 2013-159 the review panel granted a review of the correctness of these two findings in Decision 2012-104. The two grounds for review and variance are addressed together below because of the substantial overlap in the procedural background applicable to consideration of each of them and in the arguments made respecting them.

128. On September 20, 2010 the Commission initiated Proceeding No. 790 by notice as directed by the judgment of the Court of Appeal of Alberta in *Milner Power Inc. v. Alberta (Energy and Utilities Board)*, 2010 ABCA 236. That judgment vacated EUB Decision 2005-150 and remitted Milner's August 2005 complaint to the Board, now the Commission, to hold a hearing to determine whether there was a contravention of Section 19 of the 2004 *Transmission Regulation*, as alleged.[94] This is the only purpose for the hearing indicated by the Commission's Notice of hearing.

129. On February 10, 2011 the Commission released an issues list for hearing and requested submissions of parties regarding bifurcating the proceeding into two phases, the second phase only being necessary if the Commission were to decide that the AESO Line Loss Rule contravened Section 19 of the 2004 *Transmission Regulation*.[95]

130. By letter dated February 28, 2011 in response to an inquiry by TransCanada, the Commission ruled that "in accordance with the Court of Appeal's decision, the Commission considers that the focal point of the current proceeding is to determine whether the AESO's Line Loss Rule contravened section 19 of the 2004 *Transmission Regulation*." Further, the Commission ruled that "the first phase of the proceeding will follow the process schedule and the issues list set out in the Commission's letter of February 10, 2011."[96] Some of the parties identified that the effect of changed legislation will need consideration in phase two of the hearing; it is not anywhere identified as an issue for consideration during phase one.

131. On April 26, 2011, TransCanada submitted a motion seeking an order from the Commission declaring that in the event that Milner's complaint is successful, no specific alternative method for calculating line losses will be approved in the present complaint proceeding. The TransCanada motion also sought to strike evidence from the record related to ILF, stating that TransCanada understood that this proceeding was to be limited to a consideration of the compliance of the 2005 Line Loss Rule with the 2004 *Transmission Regulation*. TransCanada noted that its evidence would be very different in phase one of the proceeding if it was to be the only opportunity to make submissions on the content of losses going forward, rather than solely considering the validity of the present rule.[97]

132. Also on April 26, 2011, Capital Power submitted a letter seeking clarification of the scope of Proceeding No. 790. In this letter it stated "it is essential to remember that the only matter remitted to the AUC by the Alberta Court of Appeal was a determination of whether there

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94 Exhibit 64.01, AUC notice of proceeding, September 20, 2010.
95 Exhibit 99.01, AUC letter including issues list and revised proceeding schedule, February 10, 2011.
96 Exhibit 110.01, Commission ruling on bifurcating Proceeding ID No. 790, February 28, 2011, page 4, paragraphs 18 and 19.
97 Exhibit 139.01, TCE Motion for Declaration as to Scope of Proceeding, to Strike Irrelevant Evidence and for Change to the Date for Information Request, April 26, 2011, page 4.

was a contravention of section 19 of the *Transmission Regulation*, 174/2004 and not what approaches to calculating loss factors may or may not be better...'"[98]

133. By letter dated May 9, 2011 the Commission ruled that "to resolve any doubts on the part of parties to this proceeding regarding the scope of the current phase of the proceeding (phase one), the Commission directs that the issue for consideration in the current phase of the proceeding is whether the ISO's 2005 Line Loss Rule contravened Section 19 of the 2004 *Transmission Regulation*. As such, Milner's evidence regarding alternate methods for calculating line losses will be viewed by the Commission from the lens of determining the contravention of section 19."[99]

Views of parties

134. Milner argued that the hearing panel did not go beyond what it said it would do in considering Milner and ATCO's evidence concerning an Average MW-in or ILF methodology. Milner further questioned whether the hearing panel was then compelled to remain silent about an ILF methodology simply because the hearing panel had indicated that the issue for consideration in phase one of Proceeding No. 790 would be whether the ISO's 2005 Line Loss Rule contravened Section 19 of the *Transmission Regulation*"[100] Milner submitted that since "the AESO had claimed that its methodology was the 'best fit' with the *Transmission Regulation* even though it failed to meet the requirements of the regulation, the 'best fit' can only be determined if other 'fits' are rejected as unsound."[101]

135. Milner also submitted that assuming the hearing panel did go too far in saying that it is ILF that complies, the hearing panel's finding that MLF/2 is unlawful should still stand as it is an entirely separate finding. The review panel can simply remove the one alleged offending statement in paragraph 116 of Decision 2012-104. Milner also argued that it would be illogical and wasteful of the Commission's and stakeholders' time to ignore for purposes of phase two the finding that an ILF methodology is what complies."[102] Milner also contended that evidence was lacking that any party other than Milner has been prejudiced in any fashion by the hearing panel's decision to consider whether the AESO's methodology was unlawful post-2008.[103]

136. ATCO Power submitted that the Commission was not precluded in phase one of Proceeding No. 790 from determining that "an ILF methodology is what complies" with Section 19 of the 2004 *Transmission Regulation* and the *Electric Utilities Act* and that the Commission did not err in doing so.[104] ATCO Power further argued that this determination merely utilized the evidence regarding the ILF methodology from the lens of determining the contravention of

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98 Exhibit 138.01, Capital Power letter, April 26, 2011, page 2, paragraph 5.

99 Exhibit 154.01, AUC ruling on TransCanada motion, May 9, 2011, page 3, paragraph 16. In a separate letter on May 9, 2011, the Commission responded to Capital Power's April 26, 2011 request by directing parties to the Commission's ruling on the TransCanada motion.

100 Exhibit 484.01, Milner Power Inc. Final Argument, November 27, 2013, page 93, paragraph 240 and page 94, paragraph 242.

101 Exhibit 484.01, Milner Power Inc. Final Argument, November 27, 2013, page 94, paragraph 243.

102 Exhibit 484.01, Milner Power Inc. Final Argument, November 27, 2013, page 94, paragraph 245.

103 Exhibit 484.01, Milner Power Inc. Final Argument, November 27, 2013, page 95, paragraph 248 and 249.

104 Exhibit 485.01, ATCO Power, Written Argument, November 27, 2014, page 42, paragraph 136.

Section 19 as indicated in paragraph 16 of the Commission's May 9, 2011 ruling (exhibit 154.01).[105]

137. ATCO Power submitted that the hearing panel's finding that the 2005 Line Loss Rule post 2008 contravenes the relevant regulatory framework was not an error. Rather it was simply a recognition that there have been no substantive changes to the 2005 Line Loss Rule since it came into effect on January 1, 2006,[106] and that the hearing panel did not err in finding that the AESO's current line loss rule would not meet the standard of review under the 2007 *Electric Utilities Act*.[107]

138. Encana submitted that the connection of the finding that ILF is what complies with the other proper findings by the hearing panel aligns with the Commission's bifurcation ruling and justified its making.[108]

139. The AESO, the Generator Group and ENMAX Energy Corporation (ENMAX) presented oppositions contrary to the review opponents. Since their arguments are accepted in the Commission's findings, they are not summarized here.

Commission findings

140. The Commission finds that each of the two findings made by the hearing panel and described in paragraphs 125 and 126 above is material because it is of significance regarding the determinations to be made during phase two of Proceeding No. 790. The review panel finds that neither of these findings was needed for, nor relevant to, the hearing panel's two findings made in Decision 2012-104 which found that the 2005 Line Loss Rule does not comply with the 2004 *Transmission Regulation* and the 2003 *Electric Utilities Act* and that it is also unreasonable and unjustly discriminatory. Accordingly the two impugned findings contained in paragraphs 6, 116, and 120 of Decision 2012-104 have no effect upon the correctness of the findings that the 2005 Line Loss Rule does not comply with the 2004 *Transmission Regulation* and the 2003 *Electric Utilities Act* and that it is also unreasonable and unjustly discriminatory.

141. Section 4 of the *Administrative Procedures and Jurisdiction Act* states:

> **Evidence and representations**
>
> **4** Before an authority, in the exercise of a statutory power, refuses the application of or makes a decision or order adversely affecting the rights of a party, the authority
>
> a) shall give the party a reasonable opportunity of furnishing relevant evidence to the authority,
>
> b) shall inform the party of the facts in its possession or the allegations made to it contrary to the interests of the party in sufficient detail
>
> (i) to permit the party to understand the facts or allegations, and

[105] Exhibit 485.01, ATCO Power, Written Argument, November 27, 2014, page 43, paragraph 138.
[106] Exhibit 485.01, ATCO Power Written Argument, November 27, 2013, page 49, paragraph 161.
[107] Exhibit 485.01, ATCO Power Written Argument, November 27, 2013, page 49, paragraph 163.
[108] Exhibit 486.01, Encana Argument, November 28, 2013, page 159, paragraph 384.

> (ii) to afford the party a reasonable opportunity to furnish relevant evidence to contradict or explain the facts or allegations, and;
>
> c) shall give the party an adequate opportunity of making representations by way of argument to the authority.

142. Section 9(2) of the *Alberta Utilities Commission Act* states:

> **9(2)** If it appears to the Commission that its decision or order on an application may directly and adversely affect the rights of a person, the Commission shall
>
> (a) give notice of the application in accordance with the Commission rules,
>
> (b) give the person a reasonable opportunity of learning the facts bearing on the application as presented to the Commission by the applicant and other parties to the application, and
>
> (c) hold a hearing.

143. As stated by the Supreme Court of Canada, "[p]rocedural fairness is a cornerstone of modern Canadian administrative law."[109] Even if this right was not protected by legislation such as quoted above, the general rule is that an administrator must give adequate notice to permit affected persons to know how they might be affected and to prepare themselves adequately to make representations.[110]

144. None of the review opponents identified any communications on the record of Proceeding No. 790 that would have given notice to parties that the hearing panel intended to make decisions such as the decisions described in paragraphs 6, 116, and 120 of Decision 2012-104. In fact the Commission's directions in its May 9, 2011 letters were to the contrary effect. Accordingly the Commission finds that the review applicants were not given adequate notice regarding and reasonable opportunity to present their case on these two issues. As a result there was sufficient lack of procedural fairness in making these two particular findings so as to constitute material error of law or improper exercise of jurisdiction by the hearing panel in such regards.

145. As indicated in *Anderson v Alberta Securities Commission*, "[T]he appropriate remedy in the circumstances of a breach of procedural fairness is to return the matter for a rehearing."[111] The rehearing of the matters determined in paragraphs 6, 116, and 120 of Decision 2012-104 will be afforded during phase 2 of the hearing of Milner's complaint ordered in Decision 2012-104.

146. Consequently the hearing panel's findings made in paragraphs 6, 116 and 120 of Decision 2012-104 are vacated and the decision varied accordingly, without prejudice to subsequent determination of these issues on the merits in other proceedings.

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[109] Paragraph 79 in *Dunsmuir v New Brunswick*, 2008 SCC 9

[110] As stated in David P. Jones and Anne S. de Villars, Principles of Administrative Law at 258 quoted with approval in *Del Bianco* v *Alberta Securities Commission*, 2004 ABCA 244

[111] 2008 ABCA 184 at paragraph 30

7 Order

147. For the reasons given in this decision, the findings in Decision 2012-104 that ISO rule 9.2: *Transmission Loss Factors* and Appendix 7: *Transmission Loss Factor Methodology and Assumptions* do not comply with the 2004 *Transmission Regulation* and are unjust, unreasonable, unduly preferential, arbitrarily or unjustly discriminatory and inconsistent with or in contravention of the 2003 *Electric Utilities Act* are confirmed except with respect to the findings made in paragraphs 6,116 and120 which are hereby rescinded and are of no force and effect.

148. As directed in paragraph 167 of Decision 2012-104 the Commission will proceed with the second phase of its consideration of Milner's complaint to determine the relief or remedy to be given. The Commission will issue a process letter shortly seeking submissions from parties: 1) on the procedure for the second phase of the proceeding; 2) on the process that the AESO should pursue to address the issues raised by the Commission in this proceeding; and 3) on any other matters necessary for the Commission to consider.

Dated on April 16, 2014.

The Alberta Utilities Commission

(original signed by)

Willie Grieve, QC
Chair

(original signed by)

Neil Jamieson
Commission Member

(original signed by)

Bohdan (Don) Romaniuk
Acting Commission Member

Appendix 1 – Proceeding participants

Name of organization (abbreviation) counsel or representative	Witnesses
Alberta Direct Connect Consumers Association (ADC) Colette Chekerda	
Alberta Electric System Operator (AESO) David Holgate – Stikeman Elliott LLP	Jerry Mossing – Vice President, Transmission Planning and Performance Cheryl Terry – Senior Advisor Market Policy Richard Stout – President, Ronin Utility Consulting Ltd. Robert Burton – Senior Specialist Consultant, Teshmont Consultants LP
ATCO Power Ltd. (ATCO Power) Marie Buchinski – Bennett Jones LLP	Carl Fuchshuber – Vice President, Commercial Strategic Planning Horst Klinkenborg – Manager, Regulatory and Strategic Planning Deniz Corbaci – Economic Analyst of Regulatory and Strategic Planning
Capital Power Corporation (Capital Power) Dennis Langen – Dentons Canada LLP	Daniel Jurijew – Senior Manager Regulatory Affairs West
Encana Corporation (Encana) Rosa Twyman – Regulatory Law Chambers LLP	
ENMAX Energy Corporation (ENMAX) David Wood – Torys LLP	R.V. (Randy) Stubbings – Director, Regulatory Policy
Industrial Power Consumers Association of Alberta (IPCAA) Sheldon Fulton	
Milner Power Inc. (Milner) Monte Forster Jeff Christian – Lawson Lundell LLP Lewis Manning – Lawson Lundell LLP	John Bobenic – President Maxim Power Corporation Ross Baldick – University of Texas, President Transportation and Electricity Convergence John MacCormack – Consultant Alex Rudkevich – President, Newton Energy Group Steven Stoft – Consultant, British Department of Energy and Climate Change
TransAlta Corporation (TransAlta) Laura-Marie Berg Bernette Ho – Norton Rose Fulbright Canada LLP Joshua Jantzi – Dentons Canada LLP	Bob Smith – Manager Regulatory Affairs

Name of organization (abbreviation) counsel or representative	Witnesses
TransCanada Energy Ltd. (TransCanada) Nadine Berge Steven Kley	Vince Kostesky – Director Market Services and Environmental Policy Dan Levson – Power Industry Consultant, Bema Enterprises Craig Roach – President, Boston Pacific Company Inc. Mobinul Huq – Associate Professor in Economics, University of Saskatchewan

Alberta Utilities Commission

Commission Panel
W. Grieve, QC, Chair
N. Jamieson, Commission Member
B. Romaniuk, Acting Commission Member

Commission Staff
J. Petch, QC (Commission Counsel)
A. Davison (Senior Market Analyst)
G. Andrews (Market Analyst)

Appendix 2 – Abbreviations

Abbreviation	Name in Full
ADC	The Alberta Direct Connect Consumer Association
AESO	Alberta Electric System Operator
AIES	Alberta Interconnected Electric System
ATCO Power	ATCO Power Ltd.
AUC or the Commission	Alberta Utilities Commission
Capital Power	Capital Power Corporation
Encana	Encana Corporation
ENMAX	ENMAX Energy Corporation
EUB or the Board	Alberta Energy Utilities Board
FEOC	Fair, Efficient and Openly Competitive
Generator Group	Capital Power Corporation, TransAlta Corporation and TransCanada Energy Ltd.
ILF	Incremental Loss Factor
IPCAA	Industrial Power Consumers Association of Alberta
ISO	Independent System Operator
LLR	Line Loss Rule
Milner	Milner Power Inc.
MLF	Marginal Loss Factor
MLL	Marginal Line Loss
TDP	Transmission Development Policy
TransAlta	TransAlta Corporation
TransCanada	TransCanada Energy Ltd.
Transmission Development Policy	Transmission Development: The Right Path for Alberta – A Policy Paper