

Q2 2016 Update on Implementation Plan to Develop a Revised Loss Factor Rule in Compliance With Decision 790-D03-2015

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Milner Power Inc. and ATCO Power Ltd. Complaints Regarding ISO Transmission Loss
Factor Rule and Loss Factor Methodology
Proceeding 790 Phase 2 Module B

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1 Introduction

- 1 On November 26, 2015, the Alberta Utilities Commission (“Commission”) issued Decision 790-D03-2015 (“Decision”) addressing *Complaints regarding the ISO Transmission Loss Factor Rule and Loss Factor Methodology*, including directions to the AESO to change Section 501.10 of the ISO rules, *Transmission Loss Factor Methodology and Requirements* (“Loss Factor Rule”), to implement the Commission’s findings in the Decision.
- 2 On February 1, 2016, the AESO filed its *Implementation Plan to Develop a Revised Loss Factor Rule in Compliance With Decision 790-D03-2015*¹ (“Implementation Plan”). In the Implementation Plan, the AESO proposed to file quarterly updates with the Commission, which would report progress on the implementation activities described in the Implementation Plan.²
- 3 On March 18, 2016, the Commission issued its ruling³ approving the Implementation Plan (“Ruling”), subject to certain qualifications and clarifications noted in the Ruling. In particular, the Commission found the AESO’s proposal for quarterly updates to be reasonable and consistent with the Decision.⁴ Accordingly, on March 31, 2016, the AESO filed its *Q1 2016 Update on Implementation Plan to Develop a Revised Loss Factor Rule in Compliance With Decision 790-D03-2015*⁵ (“Q1 Update”).
- 4 This submission is the Q2 2016 update (“Q2 Update”) on the Implementation Plan. This Q2 Update primarily provides information on the activities described in the Implementation Plan that were planned to take place by September 30, 2016. This Q2 Update only addresses information that supplements or changes information already placed on the record by the AESO in Proceeding 790 since the Decision was issued. That is, this Q2 Update does not repeat information that remains unchanged from information already provided in:
- the AESO’s *Request for Clarifications, and the AESO’s Proposed Approaches and Assumptions for the Implementation Plan*, dated January 15, 2016;⁶
 - the Implementation Plan;
 - the *Responses of the AESO to Submissions Regarding the AESO’s 15 January 2016 Letter to the Commission and the 01 February 2016 Implementation Plan*, dated February 23, 2016⁷ (“Responses to Submissions”);
 - the Notes from the Commission’s round-table technical meeting, February 25, 2016 (“Round-Table Meeting”), issued by the Commission on March 9, 2016;⁸ and
 - the Q1 Update.
- 5 The AESO held its first technical meeting on June 7, 2016 (“Technical Meeting”), which was attended by representatives of 14 stakeholders and focused on discussion of:
- the treatment of net-to-grid values based on merit order volumes; and
 - alternative approaches to the application of shift factors in the loss factor calculation methodology.
- 6 The AESO’s conclusions on these matters, based in part on considerations raised by stakeholders, are incorporated into later sections of this Q2 Update.

¹ Exhibit 790-X0452.

² *Ibid.* at paragraph 44.

³ Exhibit 790-X0467.

⁴ *Ibid.* at paragraph 44.

⁵ Exhibit 790-X0469.

⁶ Exhibit 790-X0445.

⁷ Exhibit 790-X0463.

⁸ Exhibit 790-X0466.

- 7 This Q2 Update is organized in the same structure as the Implementation Plan, with sections addressing implementation activities, timeline, and approaches and assumptions to develop a revised Loss Factor Rule (“Revised Loss Factor Rule”) that implements the Commission’s findings in the Decision.
- 8 The AESO notes that, from time to time, stakeholders ask questions of or make observations to the AESO regarding matters related to the calculation of 2017 loss factors in compliance with the Decision. To ensure transparency and facilitate the open exchange of relevant information, the AESO has and will continue to disclose to the Commission and stakeholders discussions that could have a material impact on the AESO’s calculation of 2017 loss factors.

2 Implementation Activities

9 The activities described in the Implementation Plan that were planned to take place by September 30, 2016 include assembling input data, creating topology cases, confirming reconfigurations, developing software and scripts, and submitting the Revised Loss Factor Rule. The following subsections provide updates on those activities.

10 At this time the AESO has no updates to the later activities included in the Implementation Plan, namely, calculating loss factors or issuing loss factors. Those activities are expected to proceed as described in the Implementation Plan and other information already on the record in Proceeding 790. The AESO remains of the view that it is possible to implement the Commission's findings and develop the Revised Loss Factor Rule in order to achieve a January 1, 2017 effective date for implementation of revised loss factors. However, the AESO provides additional comments regarding the effective date of the Revised Loss Factor Rule in section 3 below.

2.1 Assemble Input Data

11 In the Implementation Plan, the AESO explained that the Revised Loss Factor Rule requires two main sets of input data:⁹

- (i) 8,760 hours of energy market merit order ("EMMO") volumes; and
- (ii) 8,760 hours of load volumes.

12 Data files containing the EMMO volumes were posted on the AESO website on April 12, 2016, as was a data file containing 144 sample hours from the load data, as discussed in the Q1 Update.¹⁰ The AESO submitted a letter¹¹ in Proceeding 790 notifying the Commission and stakeholders of the postings. The letter also noted that the AESO had received one request from ATCO Power Ltd. ("ATCO Power") for the aggregation of the Rainbow 4 and Rainbow 5 generating units (RL1 and RB5 source assets).

13 In working with the input data, and in particular in developing a loss factor calculation methodology for behind-the-fence generation at industrial systems, distribution-connected source assets, and the City of Medicine Hat,¹² the AESO has determined that additional input data is required. Specifically, the incremental loss factor methodology requires the following additional data:

- (iii) 8,760 hours of net supply settlement volumes for all energy sources on the transmission system, identified at their associated points of supply; and
- (iv) 8,760 hours of SCADA (supervisory control and data acquisition) metering volumes for each generating unit at a generating facility.

14 The AESO considers that this additional data will result in greater accuracy in the loss factor calculation methodology. The net supply volumes and SCADA metering volumes data will be made available in its entirety by posting on the AESO website when the data files have been full assembled. The AESO expects that assembling this data will take several weeks and expects to post it near the end of August 2016.

⁹ Exhibit 790-X0452 at paragraph 17.

¹⁰ Exhibit 790-X0469 at paragraph 17.

¹¹ Exhibit 790-X0470.

¹² Identified as unresolved matters in the Commission's Ruling, Exhibit 790-X0467 at paragraph 57.

15 In that data posting, the AESO will also update the EMMO input data and load input data with additional information as discussed in the Q1 Update.¹³

2.2 Create Topology Cases

16 Based in part on discussion at the Technical Meeting, the AESO is reviewing options for the twelve monthly topology cases to be used for loss factor calculations. The options being assessed are:

- (i) maintaining full topology within industrial systems beyond their measurement points; and
- (ii) collapsing the topology of facilities beyond their measurement points by creating equivalent generating units and loads at a transmission bus.

17 Examination of test cases suggests a collapsed topology can accurately represent a full topology within PSS/E with respect to real power, reactive power, and bus voltages. The AESO expects to confirm the use of collapsed topologies through further test cases and to then create the twelve monthly topology cases. The AESO expects the monthly topology cases to be available near the end of August 2016.

2.3 Develop Software and Scripts

18 The AESO continues to test and develop approaches to implement the incremental loss factor methodology through software and scripts.

19 The AESO has confirmed the practicality of using the marginal generator (rather than the Alberta-BC inertia) as the swing bus as discussed in the Q1 Update,¹⁴ and plans to implement that approach in the software and scripts.

20 The AESO has also been examining the treatment of generating facilities and load at industrial systems during the calculation of incremental loss factors. Some aspects of this matter were discussed with stakeholders during the Technical Meeting.

21 In the incremental loss factor methodology, an initial state is first solved in PSS/E with generating facilities and load operating normally based on historical data. A second state is then solved with a generating facility removed. However, there are at least three options for the removal of the generating facility in the second state, as illustrated in the example in Table 1 below.

22 Table 1 illustrates an initial state 1 with 103 MW of gross generation within an industrial system in the example hour. The industrial system also includes 62 MW of gross load, which results in net-to-grid generation at the measurement point of 41 MW.

Table 1 – Example States and Conditions for Incremental Loss Factor Methodology

<i>State and Condition</i>	<i>Gross Generation (MW)</i>	<i>Gross Load (MW)</i>	<i>Net-to-Grid Generation (Load) (MW)</i>
1. Initial State: Normal	103	(62)	41
2. Second State: Removal of:			
(a) Generation and Load	–	–	–
(b) Gross Generation	–	(62)	(62)
(c) Net Generation	62	(62)	–

¹³ Exhibit 790-X0469 at paragraphs 13 and 19.

¹⁴ *Ibid.* at paragraph 24.

23 The removal of the generating facility in the second state could be carried out in at least three ways. In state 2(a), both generation and load are removed such that net-to-grid generation is reduced to 0 MW and there are no facilities connected behind the measurement point. In state 2(b), the gross generation is removed while the gross load remains connected, such that net-to-grid load of 62 MW results. Finally, in state 2(c), gross generation is reduced to balance gross load, such that net-to-grid generation is reduced to 0 MW, although both load and generation facilities remain connected behind the measurement point.

24 The AESO considers three factors to be important with respect to the states illustrated in Table 1:

- (a) Loss factors are applied to net-to-grid generation at the measurement point, not to gross generation. That is, loss factors are applied to the 41 MW of net-to-grid generation in state 1 in Table 1, even if 103 MW of generation is removed in state 2(a) or 2(b).
- (b) Most industrial systems operate generation and load in integrated processes. Generally, generation is reduced in conjunction with a reduction in load. It is unrealistic to assume that all gross load will remain if all gross generation is removed.
- (c) In the Decision, the Commission directed the AESO to perform the incremental loss factor calculations by keeping load constant when generation is (notionally) removed from the system.¹⁵

25 The AESO notes that an industrial system can elect to offer into the energy market on either a gross generation basis or a net-to-grid generation basis. A majority of industrial systems offer on a gross generation basis. However, the additional input data discussed in section 2.1 above will allow gross merit order offers to be readily adjusted to a net-to-grid basis.

26 During the Technical Meeting, stakeholders suggested at least one other option for the second state: that the gross generation be removed and the gross load be reduced to the capacity contracted for the site under Rate DTS. Stakeholders suggested the Rate DTS contract capacity could represent the “base load” that would be supplied from the transmission system in the event generating units were off-line. The AESO disagrees and considers that load capacity may be contracted under Rate DTS for a variety of reasons, including for start-up of generating units when returning to operation.

27 Having regard for all of these consideration, the AESO intends to develop the software and scripts to calculate incremental loss factors based on state 2(c) as the second state. That is, the software will reduce gross generation to balance gross load within an industrial system, such that net-to-grid generation is reduced to 0 MW although both load and generation facilities remain connected behind the measurement point. A similar approach will be used for distribution-connected source assets and the City of Medicine Hat.

28 As stated in the Q1 Update,¹⁶ the AESO will post the software and scripts on its website when they are completed and will notify the Commission and stakeholders that the software and scripts have been posted by filing a letter in Proceeding 790, with links to the posting.

2.4 Submit Revised Rule

29 The AESO is developing the framework of the Revised Loss Factor Rule that is comparable in scope and detail to the proposed Loss Factor Rule¹⁷ submitted by the AESO during Module B of Proceeding 790. The AESO expects to complete drafting of the Revised Loss Factor Rule in conjunction with the development of the software and scripts discussed above, for submission to the Commission in late August 2016.

¹⁵ Decision 790-D03-2015 at paragraph 5(d).

¹⁶ Exhibit 790-X0469 at paragraph 26.

¹⁷ Exhibit 790-X0345.

3 Timeline

30 In the Implementation Plan, the AESO provided a high-level timeline of activities and noted a certain amount of flexibility in starting and ending activities in the timeline. The AESO provided an update on its progress on activities in the Q1 Update.¹⁸

31 In general, the expected duration of activities has been extended to accommodate the additional work discussed in section 2 above, compared to the information provided in the Implementation Plan and Q1 Update.

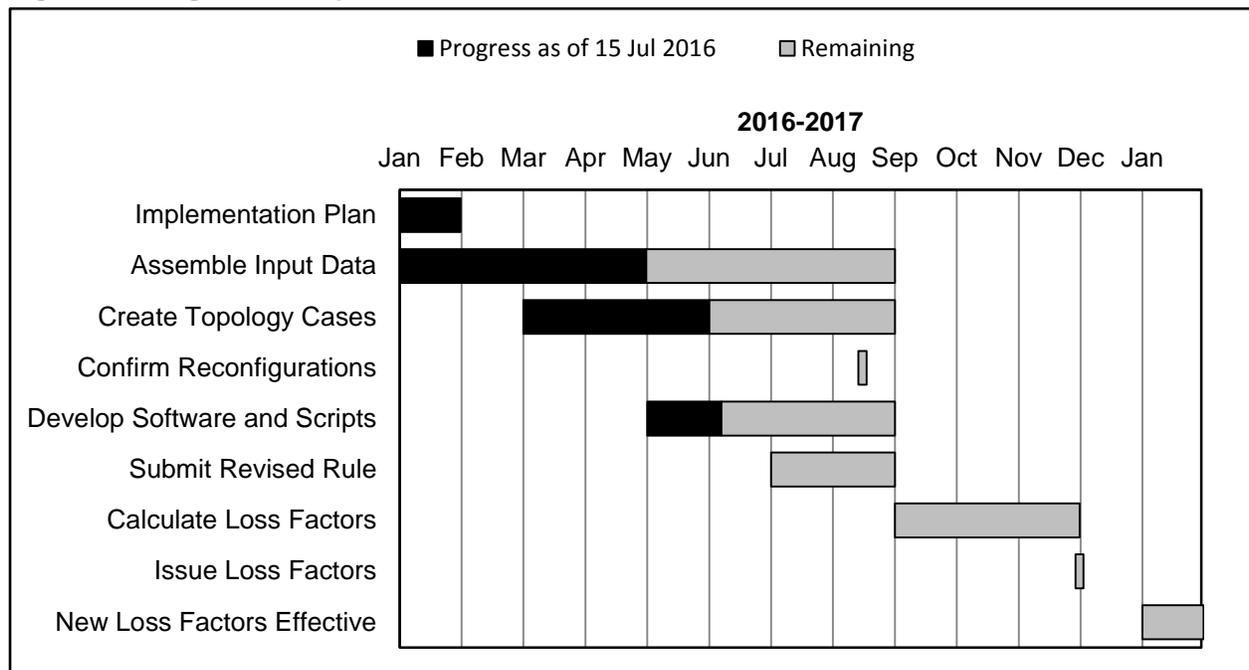
32 Figure 1 illustrates the progress on the activities in the timeline as of July 15, 2016.

33 The durations of both the “assemble input data” and “create topology cases” activities have been extended to the end of August 2016. The need for additional input data and the decisions regarding treatment of facilities beyond the measurement point both require work beyond what was initially expected by the AESO. These activities are currently about 50% complete and the AESO expects they can be concluded in parallel with the development of software and scripts for the loss factor calculations.

34 As well, the deadline for market participants to request aggregation or disaggregation of generating units for the calculation of 2017 loss factors has been extended to August 15, 2016, as discussed in more detail in section 4.2 below.

35 The AESO remains of the view that a January 1, 2017 effective date for implementation of revised loss factors is achievable, subject to the timing of the process and schedule established by the Commission with respect to the Revised Loss Factor Rule as discussed below.

Figure 1 – Progress on Implementation Timeline for Revised Loss Factor Rule



¹⁸ Exhibit 790-X0469 at paragraph 28.

- 36 As discussed in the Q1 Update,¹⁹ the AESO proposed to hold technical meetings with stakeholders at appropriate points during the implementation activities, in order to ensure transparency of any technical decisions the AESO makes and to provide an opportunity for stakeholders to comment. As noted above in section 1, the AESO held its Technical Meeting on June 7, 2016. The invitation to stakeholders and presentation slides are posted on the AESO website and may be accessed at www.aeso.ca by following the path Transmission ► Loss Factors ► Implementation of Revised Loss Factor Rule.
- 37 Also as noted in section 1 above, the Technical Meeting focused on discussion of two matters: the treatment of net-to grid values based on merit order volumes and alternative approaches to the application of shift factors in the loss factor calculation methodology. The AESO notes that there was not unanimous stakeholder support for the AESO's proposed treatment of either of those matters.
- 38 The AESO has reviewed its proposed approaches having regard to stakeholder comments and its resulting conclusions are set out in this Q2 Update. However, based on the divergence of stakeholder views expressed at the Technical Meeting, the AESO anticipates that the approaches that the AESO intends to take, when included in the Revised Loss Factor Rule to be submitted in Q3, will be opposed by some participants in Proceeding 790. Depending on the process and schedule established by the Commission with respect to the Revised Loss Factor Rule, it is possible that the rule could not be implemented on January 1, 2017. The AESO raises this matter at this time as it may warrant consideration by the Commission prior to the submission of the Revised Loss Factor Rule.

¹⁹ *Ibid.* at paragraph 29.

4 Approaches and Assumptions

4.1 Preliminary Assessment of Compliance of Existing Locations

39 The AESO included a Preliminary Assessment of Compliance of Existing Locations workbook²⁰ as an Appendix to the Implementation Plan, to assist the Commission and stakeholders in understanding the impact of the AESO's approaches and assumptions regarding the location direction²¹ in the Decision.

40 The AESO's preliminary assessment indicated certain existing generating facilities would not be compliant with the requirements established by the Decision, in particular the requirement for a one-to-one correspondence between measurement point and energy market supply point set out in both the Implementation Plan²² and the Ruling.²³ The AESO is presently considering how those requirements should be implemented in the Revised Loss Factor Rule with respect to those generating facilities, including discussions with the affected market participants.

4.2 Market Participant Obligations Regarding Aggregation

41 In the Implementation Plan the AESO stated that it required all requests for aggregation or disaggregation of generating units to be received by March 31, 2016, for the calculation of 2017 loss factors.²⁴ The Commission found the AESO's approach reasonable in the Ruling.²⁵

42 Although submission notices of the Implementation Plan and other AESO documents in Proceeding 790 have been broadly distributed, the March 31 deadline for aggregation or disaggregation requests may not have been sufficiently highlighted in those notices. As a result, some parties may not have been aware of the March 31 deadline. In particular, the Balancing Pool (who registered in Proceeding 790 on July 7, 2016²⁶) advised the AESO in early June that it had been previously unaware of the March 31 deadline.

43 Accordingly, the AESO will extend the deadline for requests for aggregation or disaggregation of generating units for the calculation of 2017 loss factors to August 15, 2016 and to provide general notice through a posting in the AESO's stakeholder newsletter.

44 The AESO further noted in the Implementation Plan:²⁷

For a requested aggregation or disaggregation of generating units or AGFs, the AESO will require sufficient notice from a market participant to plan and implement any required physical reconfiguration, as well as to review and revise any affected measurement point definition records. If practical, aggregation will be implemented through totalized billing rather than physical reconfiguration. Similarly, if practical, disaggregation will be implemented using existing metering facilities where available. The AESO will assess requests for aggregation or disaggregation on a case-by-case basis, at least until greater familiarity with the process is developed.

45 The same consideration will apply to any requests received before the new August 15 deadline. In particular, the AESO will assess each request for aggregation or disaggregation on a case-by-case basis to determine if it is practical to implement the aggregation or disaggregation for the calculation of 2017 loss factors.

²⁰ Exhibit 790-X0453.

²¹ Decision 790-D03-2015 at paragraph 5(c).

²² Exhibit 790-X0452 at paragraph 49.

²³ Exhibit 790-X0467 at paragraph 46.

²⁴ Exhibit 790-X0452 at paragraph 23.

²⁵ Exhibit 790-X0467 at paragraph 35.

²⁶ Exhibit 790-X3061.

²⁷ Exhibit 790-X0452 at paragraph 58.

4.2 Shift Factors and Expected Steps for the Loss Factor Calculation Methodology

46 In section 3.11 of the Implementation Plan, the AESO indicated that it would apply a single shift factor after calculating a volume-weighted average loss factor for each source asset. The AESO further addressed the use of a single annual shift factor, rather than hourly shift factors, in response to EEC-4 in the Responses to Submissions.²⁸

...Based on examination of EEC's examples, the same annual final loss factors will result from an initial set of hourly raw loss factors whether the raw loss factors are first shifted hourly and then averaged, or averaged first and then shifted. Accordingly, the AESO considers that a single annual shift factor appropriately reflects the raw loss factors determined through the proposed incremental loss factor methodology (when the averaging includes appropriate volume-weighting as proposed by the AESO).

47 During the Round-Table Meeting, the topic of annual versus hourly shift factors was further discussed²⁹ and the AESO's intention to explore the issue further with ENMAX Energy Corporation ("ENMAX") was noted in the Ruling.³⁰

48 In the Q1 Update, the AESO noted that, after discussing this matter with ENMAX following the Round-Table Meeting and undertaking a further examination of additional examples, it had concluded that different loss factors will result if hourly shift factors are applied compared to a single annual shift factor.³¹ Consequently, the AESO considered it appropriate to use hourly shift factors in the calculation of raw loss factors.

49 In response to the information provided in the Q1 Update, ATCO Power contacted the AESO about the AESO's conclusion and coordinated further discussions between the AESO, ATCO Power, ENMAX, and Milner Power Inc. The discussions included review of a Microsoft Excel workbook example provided by ATCO Power. Following these discussions, the AESO further examined the matter and also reviewed it with stakeholders during the Technical Meeting. During the Technical Meeting, some stakeholders supported the use of a single annual shift factor, others supported the use of both hourly and annual shift factors, and others did not express an opinion at the meeting.

50 The AESO concludes that it remains appropriate to use hourly shift factors in the calculation of raw loss factors, for the reasons discussed below.

51 The use of one or more shift factors in the calculation of loss factors has two purposes:

- (i) **To adjust loss factors to recover the correct amounts of losses** — As noted in the Decision, "Any ILF method ... will over recover the volume of losses and require that a shift factor be applied to each generator's loss factor in order to collect the correct amount of losses."³²
- (ii) **To maintain economic signals between generating facilities while doing so** — The application of a common shift factor to all loss factors maintains economic signals by retaining the loss factor differentials between generating facilities. All loss factors are shifted upward or downward by a common amount.

²⁸ Exhibit 790-X0463 at page 8.

²⁹ Exhibit 790-X0466 at section 11.

³⁰ Exhibit 790-X0467 at paragraph 62.

³¹ Exhibit 790-X0469 at paragraph 35.

³² Decision 790-D03-2015 at paragraph 162.

52 Some stakeholders suggested that recovering the correct amount of losses is only relevant on an annual basis. They noted that section 33(1) of the *Transmission Regulation* specifically requires that “the actual cost of losses is reasonably recovered through charges and credits under the ISO tariff on an annual basis.” However, the legislation does not direct how the AESO is to undertake the detailed calculation of loss factors in order to fulfill the requirements of section 33(1).

53 The AESO is of the view that there is merit in ENMAX’s position that generating facilities that are online in different periods will be impacted by the use of a single annual shift factor.³³ In particular, the AESO is of the view that the use of hourly shift factors better maintains economic signals between generating facilities, particularly when a generating facility does not operate in many hours of the year.

54 As an illustration of the potential impact of using a single annual shift factor compared to hourly shift factors, Table 2 below provides results adapted from the Excel workbook provided by ATCO Power. The workbook is included as an appendix to this Q2 Update. The appendix includes a version of the Excel workbook provided by ATCO Power, along with a version in which some formulas have been modified by the AESO to reflect the AESO’s view that a loss factor cannot be calculated for a generating facility in an hour during which it is not operating (ATCO Power’s workbook calculated a loss factor of 0% for a generating facility that is not operating in an hour). The results presented in Table 2 were not affected by the AESO’s modifications to the workbook. The AESO acknowledges that the workbook uses a simple two-bus model that does not reflect the complexities of the transmission system, but considers that the results illustrate how the use of hourly shift factors better maintain economic signals between generating facilities.

55 Table 2 provides incremental loss factors calculated for a base load generating facility and a peaking unit generating facility, under three load conditions: high (column B), medium (column C), and low (column D). The base load facility generates under each of the load conditions, with raw loss factors of 15.0%, 3.2%,

Table 2 – Example of Impacts of Annual and Hourly Shift Factors

	<i>Capacity</i> <i>[A]</i>	<i>High</i> <i>Load</i> <i>[B]</i>	<i>Medium</i> <i>Load</i> <i>[C]</i>	<i>Low</i> <i>Load</i> <i>[D]</i>	<i>Weighted</i> <i>Average</i> <i>[E]</i>	<i>Annual</i> <i>Shifted</i> <i>[F]</i>
Hours (hrs)	500	50	300	150		
With Single Annual Shift Factor						
Base Load Unit (MW)	100	100	100	25		
Raw Loss Factor (%)		15.0%	3.2%	0.0%	4.4%	7.0%
Peaking Unit	75	25	–	–		
Raw Loss Factor (%)		0.0%	NA	NA	0.0%	2.6%
Loss Factor Differential (%)		15.0%	NA	NA	4.4%	4.4%
With Hourly Shift Factors						
Base Load Unit (MW)	100	100	100	25		
Shifted Loss Factor (%)		9.7%	7.0%	4.5%	7.1%	7.1%
Peaking Unit	75	25	–	–		
Shifted Loss Factor (%)		(5.3%)	NA	NA	(5.3%)	(5.3%)
Loss Factor Differential (%)		15.0%	NA	NA	12.5%	12.5%

³³ Exhibit 790-X0454 at page 4.

Note: “NA” means not applicable.

and 0.0%, respectively. The peaking unit facility generates only under the high load condition, with a raw loss factor of 0.0%. Since the peaking unit facility does not generate under the medium and low load conditions, loss factors cannot be calculated for it under those conditions.

56 When the peaking unit facility is generating under high load conditions, the loss factor differential between it and the base load unit is 15.0% (column B).

57 If a single annual shift factor is used, the average raw loss factor is 4.4% for the base load facility and 0.0% for the peaking unit facility (column E). When shifted, those loss factors become 7.0% and 2.6%, respectively (column F). The loss factor differential between the two facilities is 4.4% (column F). This loss factor differential is significantly less than the raw loss factor differential of 15.0% that exists under high load conditions, when the peaking unit facility is generating.

58 Loss factor differentials were better maintained when hourly shift factors are used, as the average shifted loss factor is 7.1% for the base load facility and (5.3%) (credit) for the peaking unit facility (column F). The loss factor differential between the two facilities is 12.5% (column F). The use of hourly shift factors results in an annual shifted loss factor differential that is much closer to the raw loss factor differential of 15.0% that exists under high load conditions.

59 When more generally considering the scenario of generating facilities operating in different hours, it seems likely to the AESO that calculating average raw loss factors over all hours would reduce the differentials between generating facilities that operate only in peak hours and those that operate in most hours. Therefore, using a single annual shift factor could result in a systemic bias between generating facilities that operate in different periods, with respect to maintaining economic signals between generating facilities.

60 Consistent with its conclusion in the Q1 Update,³⁴ the AESO intends to use hourly shift factors and, if necessary to ensure the correct recovery of losses, an annual shift factor in the loss factor calculation methodology. The AESO considers that the use of hourly shift factors best satisfies the two purposes of adjusting loss factors in order to recover the correct amounts of losses and maintaining economic signals between generating facilities while doing so.

61 As stated in the Q1 Update,³⁵ the AESO will revise the methodology originally set out in section 3.11(p) of the Implementation Plan as follows:

- (a) calculate raw loss factors for each source asset in each of 8,760 hours, discarding hours with insufficient supply or that are unsolvable;
- (b) apply an hourly shift factor to all raw loss factors in each hour to ensure recovery of the calculated transmission system losses in that hour;
- (c) calculate the volume-weighted average loss factor for each source asset;
- (d) apply an annual shift factor to all average loss factors to ensure recovery of the forecast annual transmission system losses; and
- (e) use an iterative clip and shift process to ensure loss factors are within the collars specified in the *Transmission Regulation*.

³⁴ Exhibit 790-X0469 at paragraph 35.

³⁵ *Ibid.*