Addressing Concerns about the Proposed 2006 Loss Factor Methodology

1. **Two Bus System and Application To The Total AIES.**

   In March 2005, AESO conducted a study on 2-Bus system and found no discrepancies in applying the AESO proposed 50% area load methodology as a solution to the new loss factor calculation. The study is consistent with all studies done so far (on 6-Bus system and AIES system). **The results of the study match with the logical expectation in similar situations by applying charges and credits in a meaningful way.**

   A power point presentation is prepared to convey the study result to the stakeholders.

2. **Average loss factor is half of the marginal loss factor.**

   Please consider the following quadratic function –

   $$Y = aX^2 + bX \qquad \text{(Eq.1)}$$

   The derivative of the function *Y* (with respect to X) is given below –

   $$Y_1 = \frac{dY}{dX} = 2aX + b \qquad \text{(Eq.2)}$$

   The average of the function Y in Eq. 1 is given below –

   $$Y_2 = \frac{Y}{X} = aX + b \qquad \text{(Eq.3)}$$

   From Eq.2 the coefficient of the variable X is 2*a* and called the marginal factor. Similarly, from Eq.3 the coefficient of the variable X is *a* and called the average factor. Now we are clearly in a position to conclude that

   Average Factor = Marginal Factor/2 (Eq.4)

   This relation is independent of X. In other words, Eq.4 which defines the relationship between average and marginal factors is not a function of independent variable *X*.

   Thus, we can conclude the variable marginal component of the function *Y* will be twice as much of the variable average component of the function *Y*. The constant component can be compared with the shift factor which is supposed to be very low as presented in the AESO proposed 50% area load methodology.

   Table 3 and Figure 1 represent the variability of the function *Y* based on marginal and average factor.

   Table 3: Variable component of the function *Y*.

a	2a	X	Average	Marginal
0.05	0.1	0	0	0
0.05	0.1	100	5	10
0.05	0.1	200	10	20
0.05	0.1	300	15	30
0.05	0.1	400	20	40
0.05	0.1	500	25	50
0.05	0.1	600	30	60
0.05	0.1	700	35	70
0.05	0.1	800	40	80
0.05	0.1	900	45	90
0.05	0.1	1000	50	100
0.05	0.1	1100	55	110
0.05	0.1	1200	60	120

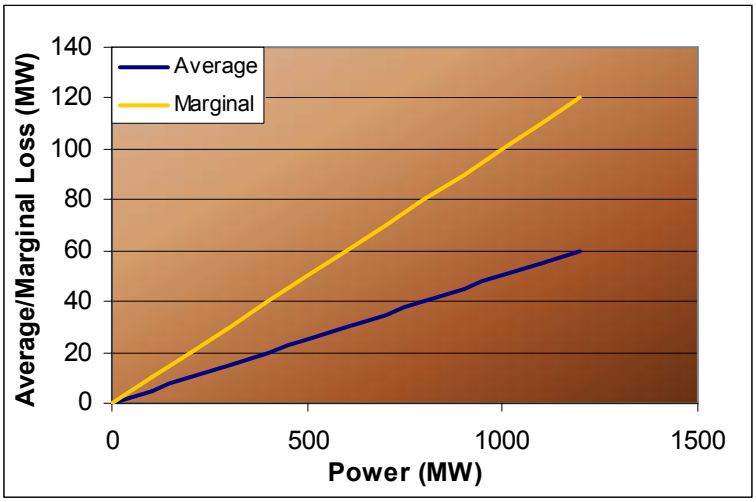

Figure 1: Graphical representation of variable component of the function *Y*.