

**Public Service Company of Colorado**  
**2012 Losses Study**  
**Derivation of Parameters for Transmission Loss Equation**

| Load Data<br>in PSSE<br>Cases | Losses<br>from PSSE<br>Cases | Estimated<br>Losses |
|-------------------------------|------------------------------|---------------------|
| 6927.0                        | 157.40                       | 169.92              |
| 6727.2                        | 149.00                       | 159.20              |
| 6526.1                        | 141.10                       | 149.09              |
| 6323.9                        | 133.30                       | 139.57              |
| 6120.6                        | 125.90                       | 130.62              |
| 5915.5                        | 119.60                       | 122.16              |
| 5709.4                        | 113.30                       | 114.22              |
| 5708.0                        | 117.00                       | 114.17              |
| 5519.0                        | 109.70                       | 107.34              |
| 5501.8                        | 106.80                       | 106.74              |
| 5500.0                        | 101.50                       | 106.68              |
| 5329.0                        | 102.80                       | 100.89              |
| 5294.2                        | 96.00                        | 99.75               |
| 5292.9                        | 100.60                       | 99.71               |
| 5138.0                        | 96.10                        | 94.80               |
| 5086.9                        | 90.80                        | 93.23               |
| 5082.5                        | 95.10                        | 93.10               |
| 4946.1                        | 90.10                        | 89.04               |
| 4878.4                        | 85.90                        | 87.10               |
| 4870.6                        | 89.90                        | 86.88               |
| 4753.0                        | 84.00                        | 83.61               |
| 4668.2                        | 81.30                        | 81.33               |
| 4657.2                        | 84.40                        | 81.04               |
| 4628.6                        | 90.80                        | 80.28               |
| 4559.1                        | 78.60                        | 78.48               |
| 4456.5                        | 76.50                        | 75.90               |
| 4443.9                        | 90.40                        | 75.59               |
| 4363.9                        | 74.20                        | 73.64               |
| 4257.5                        | 81.80                        | 71.13               |
| 4243.2                        | 72.00                        | 70.80               |
| 4167.7                        | 70.00                        | 69.08               |
| 4069.4                        | 76.00                        | 66.90               |
| 4028.2                        | 68.70                        | 66.00               |
| 3936.4                        | 59.40                        | 64.06               |
| 3879.7                        | 70.00                        | 62.88               |
| 3813.0                        | 63.00                        | 61.53               |
| 3811.7                        | 66.00                        | 61.50               |
| 3735.6                        | 54.80                        | 60.00               |
| 3688.1                        | 64.60                        | 59.07               |
| 3625.0                        | 57.30                        | 57.87               |
| 3532.8                        | 50.70                        | 56.15               |
| 3494.5                        | 59.40                        | 55.46               |
| 3434.9                        | 52.50                        | 54.39               |
| 3328.1                        | 47.20                        | 52.53               |
| 3299.1                        | 55.70                        | 52.03               |
| 3242.8                        | 48.20                        | 51.09               |
| 3121.2                        | 44.10                        | 49.10               |
| 3103.6                        | 52.90                        | 48.82               |
| 3048.6                        | 44.40                        | 47.95               |
| 2912.3                        | 41.50                        | 45.86               |
| 2906.0                        | 50.00                        | 45.77               |
| 2852.2                        | 41.40                        | 44.97               |
| 2701.1                        | 40.60                        | 42.81               |
| 2653.4                        | 39.20                        | 42.15               |
| 2487.6                        | 38.30                        | 39.93               |
| 2452.3                        | 39.40                        | 39.47               |

Equation Form Used - logest

|          |           |
|----------|-----------|
| y=bm^x   |           |
| where:   |           |
| m        | b         |
| 1.000326 | 17.737399 |

|                              |            |          |
|------------------------------|------------|----------|
| Parameters                   | 1.00032626 | 17.7374  |
| Std error                    | 7.948E-06  | 0.035888 |
| r <sup>2</sup> , std error-y | 0.9689392  | 0.067449 |
| F, degrees of freedom        | 1684.52568 | 54       |
| ss                           | 7.66348249 | 0.245664 |

MS Excel 2007

|   | A                 | B                   | C   | D               | E               | F               |
|---|-------------------|---------------------|-----|-----------------|-----------------|-----------------|
| 1 | m <sub>n</sub>    | m <sub>n-1</sub>    | ... | m <sub>2</sub>  | m <sub>1</sub>  | b               |
| 2 | se <sub>n</sub>   | se <sub>n-1</sub>   | ... | se <sub>2</sub> | se <sub>1</sub> | se <sub>b</sub> |
| 3 | r <sub>2</sub>    | se <sub>y</sub>     |     |                 |                 |                 |
| 4 | F                 | d <sub>f</sub>      |     |                 |                 |                 |
| 5 | ss <sub>reg</sub> | ss <sub>resid</sub> |     |                 |                 |                 |