

Ayers Island Outage 1-E – Oct 07, 2007 (12:38PM – 2:00PM)

There is no replacement power cost associated with this event. There was insufficient river flow at the time of the event to produce additional megawatt-hours from the station.

Eastman Falls Outage 1-L – Aug 22, 2007 (9:42PM – 10:49PM)

There is no replacement power cost associated with this event. There was insufficient river flow at the time of the event to produce additional megawatt-hours from the station.

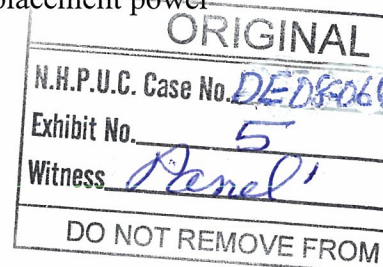
Wyman-4 Outage I – Dec 18, 2007 (5:35PM – 6:00PM)

On Dec 18, 2007 Wyman-4 was economically dispatched by ISO-NE. The unit came online at approximately 11:40AM and was ramped up to 380 MWs by 5:25PM in accordance with ISO-NE dispatch instructions. The unit tripped offline from approximately 388 MWs at 5:35PM. The unit was available to return-to-service by 6:00PM, but was not re-dispatched by ISO-NE in consideration of the unit's physical characteristics (ramp rate and minimum run time) and anticipation of reduced LMPs later in the evening.

The average inventory cost (\$/bbl) of the fuel oil that Wyman-4 burned during Dec 2007 was \$59.21/bbl. This is equivalent to an average cost of production of approximately \$99 per MWH. This value is conservative for the purposes of replacement power cost analysis since it does not include the cost of emission allowances or fuel-related O&M adders (i.e. it is fuel oil only).

During the period in which Wyman-4 was not available (5:25PM to 6:00PM), the ISO-NE real-time location marginal price (LMP) was approximately \$131/MWH. For the purpose of calculating the replacement power cost of this outage, PSNH assumes the unit would have continued to operate economically until 10:00PM. After 10:00PM, the LMPs declined such that Wyman-4 would have been shut down by ISO-NE. Based on a review of the FP&L bid prices submitted to ISO-NE, PSNH assumes the dispatch pattern shown below. Also shown is the calculation of the replacement power costs for PSNH's 3.143% share of the total output.

Period	Dispatch (MW)	PSNH Share (MW)	LMP (\$/MWH)	RPC \$
5:25 - 6:00PM	400	7.33	\$131.28	\$236.74
Hr End 7:00PM	350	11.00	\$122.96	\$263.57
Hr End 8:00PM	300	9.43	\$116.10	\$161.24
Hr End 9:00PM	300	9.43	\$118.73	\$186.03
Hr End 10:00PM	300	9.43	\$118.66	\$185.37
		46.62		\$1,032.96



Conclusion: the outage resulted in a replacement of 46.62 MWH at a net replacement power cost of approximately \$1,033 (\$5,648 spot purchase expense minus \$4,615 avoided fuel expense). Note: in row one of the table above, the calculation is for a partial hour.

Schiller CT1 Outage A – March 6, 2007 (7:25AM – 10:50AM)

There is no replacement power cost associated with this event. The unit was not dispatched to serve PSNH's energy requirement.

Schiller CT1 Outage H – Dec 13, 2007 (5:15PM) to Dec 14, 2007 (10:45AM)

Schiller CT1 received a dispatch signal from ISO-NE at 5:15PM on December 13th in response to a very short duration spike in the real-time location marginal price (LMP) to approximately \$317/MWH. The unit failed to start and remained unavailable until approximately 10:45AM on December 14th.

The spike in the LMP lasted for approximately 25 minutes (i.e. from 5:15PM to 5:40PM). For the remainder of the outage the LMPs were significantly below the production cost of energy from Schiller CT1.

The average inventory cost (\$/gal) of the jet kerosene that Schiller CT1 burned during December 2007 was \$2.51/gal. This is equivalent to an average cost of production of approximately \$251 per MWH.

PSNH has calculated the replacement power costs assuming that the LMP would have been \$317/MWH during the 25 minutes in which Schiller CT1 would have been economic if the start failure had not occurred. The lost energy resulting from the event is assumed to be $19 \text{ MW} \times (25 \text{ min} / 60 \text{ min}) = 7.9 \text{ MWH}$.

The cost of purchasing this 7.9 MWH from the ISO-NE real-time market is \$2,504 ($7.9 \times \317). The fuel expense associated with this outage is \$1,983 ($7.9 \times \251).

In addition to the 7.9 MWHs of lost economic energy production, this event was coded by ISO-NE as a "failure to reserve" event. Schiller CT1 and the other PSNH combustion turbine units participate in the ISO-NE Forward Reserve Market (FRM). During this period, Schiller CT1 was obligated to provide 19 MWs of reserves each on-peak hour ("on-peak" refers to Monday through Friday, 7:00AM to 11:00PM). The total "failure to reserve" penalty associated with this outage is 140.6 MWH. The compensation rate for reserves during this period was \$18.75 per MWH. This value was established during the seasonal forward reserve procurement auction conducted earlier in 2007. When a unit "fails to reserve", it not only loses the normal market compensation (\$18.75 per MWH) it also is assigned a penalty at a rate equal to 150% of the market compensation (\$28.13 per MWH). Therefore, the total economic impact of this outage related to the reserve market is $140.6 \text{ MWH} \times (\$18.75 \text{ plus } \$28.13) = \$6,591$.

Conclusion: the outage resulted in a net replacement power cost of \$521 (\$2,504 spot purchase expense minus \$1,983 avoided fuel expense) for energy and another \$6,591 for reserves. The total cost is \$7,112.