

Analysis of CP Penalty Risk Exposure

What is Exposure

- In finance, the amount that one may lose in an investment; the potential loss, which could be the capital invested plus any personal liability on loans in excess of the value of the property securing the loans.

Extreme Event Scenario

- Combined Cycle Unit
- Submits offer into day-head energy market
- Trips and is out of service through next operating day
- Scarcity in energy market through next operating day
- CP penalties reach annual cap

Combined Cycle Unit

Design

- Two gas turbines
- One steam turbine
- Summer Installed Capacity – 651 MW
- eFORd (class average) – 3.603%
- Location – RTO

Ownership Details

- Owned by limited liability company
- Total cost - \$777 million
- Financed with 40 percent equity and 60 percent debt
 - Owners equity = $0.40 * \$777 \text{ million} = \311 million

Energy Market Exposure

Energy Market Exposure

- Hours of Exposure
 - 13 hours of present operating day
 - 24 hours of next operating day
- LMP
 - Day-ahead market capped at \$2,000 per MWh
 - Scarcity in real time market at \$3,700 per MWh
- Energy Market Outcome
 - Revenue – 37 hours x 651 MW x \$2,000 per MWh = \$48,174,000
 - Expense – 37 hours x 651 MW x \$3,700 per MWh = \$89,121,900
 - Profit = Revenue – Expense = \$48,174,000 - \$89,121,900 = **(\$40,947,900)**
- Amount is due with 15 days of event

Capacity Market Exposure

Capacity Market Exposure

- Defined by tariff rule
- Annual CP Penalty Cap
 - $1.5 * \text{Net CONE} * 365 * \text{UCAP}$
 - $1.5 * \$299.30 / \text{MW-day} * 365 \text{ days} = \$163,867 \text{ per MW UCAP}$
- Capacity Market Penalty
 - $\$163,866.75 \text{ per MW} * 628 \text{ MW} = \$102,908,319$

Total Exposure

- Sum of Energy Market Exposure and Capacity Market Exposure
- Energy Market Exposure = \$40,947,900
- Capacity Market Exposure = \$102,908,319
- Total Exposure = \$40,947,900 + \$102,908,319 = \$143,856,219

Liquidity Considerations

What is Liquidity?

- Liquidity is a measure of the extent to which a person or organization has cash to meet immediate and short-term obligations, or assets that can be quickly converted to do this.

What are the Liquidity Priorities

- Having cash on hand to pay essential expenses
 - Payroll
 - Taxes
 - Fuel invoices
 - Utilities/Consumables
 - Debt payments

Immediate and Short-term Obligations Related to Energy Market Exposure

- Payment of Energy Market Penalty within 15 days
 - Amount - \$41 million
 - 651 MW combined cycle would have to net an hourly average of \$185 per MWh above its cost for 15 days to be compensated for its cost

Immediate and Short-term Obligations Related to Capacity Market Exposure

- Initial Billing of Capacity Market Penalty within 3 calendar months
- Amount Billed Spread Out Over Remaining Delivery Year
 - if the event occurred in June, the maximum CP penalty identified earlier, \$103 million, would be billed in 9 monthly increments of \$11.5 million per month
 - 651 MW combined cycle would have to net an hourly average of over \$18 per MWh above its cost for 9 months to be compensated for its cost (assumes capacity revenue of \$2.8 million per month based on \$150 per MW-day clearing price)
 - If the event occurred in May, the penalty would be billed in 1 increment in August
 - 651 MW combined cycle would have to net an hourly average of over \$67 per MWh above its cost for 3 months to be compensated for its cost

The Liquidity Challenge

- Paying \$41 million in 15 days
- Paying \$103 million in 45 days later
- Balancing penalty payment obligations with debt restrictions and liquidity priorities
- Might suppliers of fuel, etc. change payment terms for plant under stress?

Liquidity Solutions

- Insurance
 - Premiums are very costly
 - Deductibles are very high
 - Difficult to mitigate or offset risk
 - Increases clearing price needed for entry
- Equity Reserve
 - Increases rate of return
 - Increases clearing price needed for entry
- Consolidate and diversify
 - Bonus payments help offset penalties
 - Increases market power concerns