



# PJM Black Start Fuel Storage Compensation Education



Thomas Hauske  
Sr Lead Engineer, Performance Compliance  
Market Implementation Committee  
June 7, 2017

Annual Revenues for Black Start units are calculated from formulas in Paragraph 18 of Schedule 6A

- Traditional Black Start Generator  
 $\{(\text{Fixed BSSC}) + (\text{Variable BSSC}) + (\text{Training Costs}) + (\text{Fuel Storage Costs})\} * (1 + Z)$
- Automatic Load Rejection (ALR) Black Start Generator  
 $(\text{Training Costs}) * (1 + Z)$

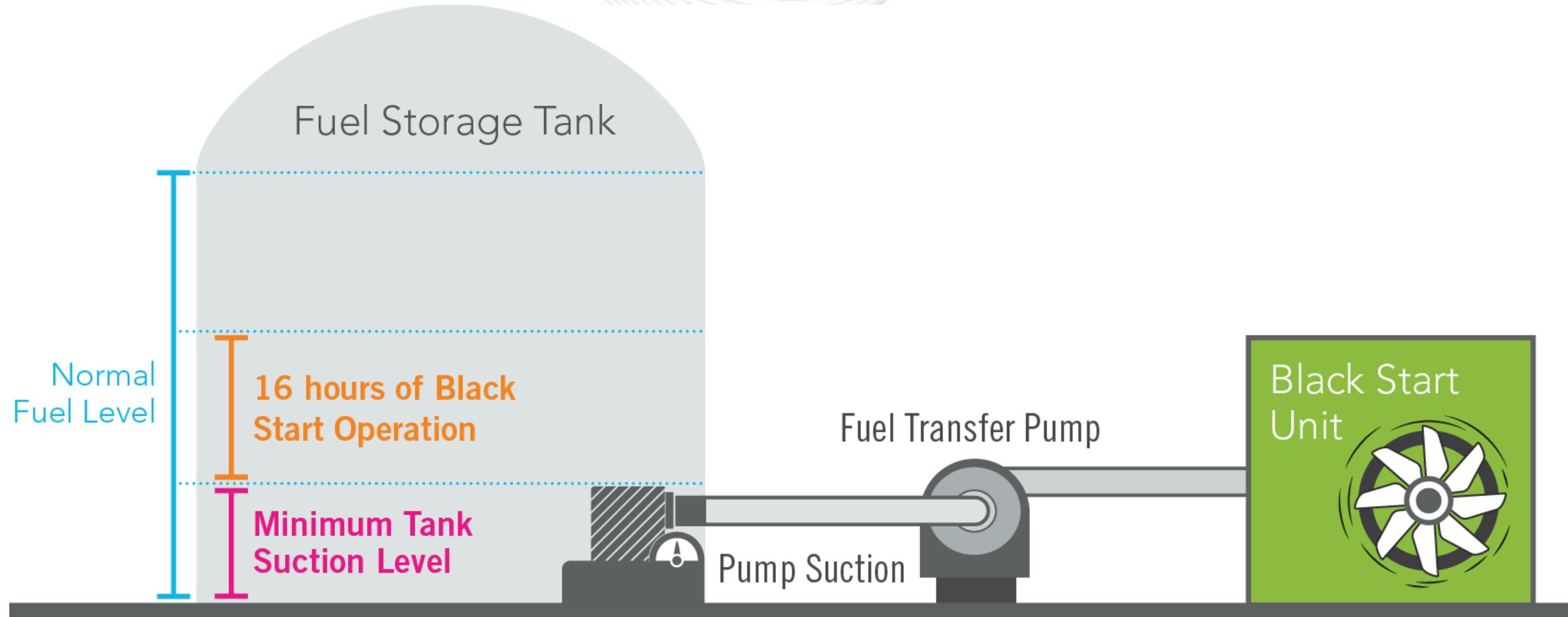
$$\{(\text{Fixed BSSC}) + (\text{Variable BSSC}) + (\text{Training Costs}) + (\text{Fuel Storage Costs})\} * (1 + Z)$$

- Fuel Storage Costs are carrying costs for liquefied natural gas, propane, or oil stored on site.
- Black Start Units that use other fuels calculate Fuel Storage Costs as zero
- ALR Unit's Fuel Storage Costs are zero

$$\{ \text{MTSL} + [(\# \text{ Run Hours}) * (\text{Fuel Burn Rate})] \} * (\text{12 Month Forward Strip} + \text{Basis}) * (\text{Bond Rate})$$

Where

- MTSL = Minimum Tank Suction Level
- # Run Hours = actual number of run hours as defined in TO Restoration Plan (lesser of 16 hours or TO Requirement)
- Fuel Burn Rate = actual fuel burn rate for unit
- 12 Month Forward Strip = average forward prices traded May 1
- Basis = transportation costs + variable taxes
- Bond Rate = Moody Utility Index Baa1 Bonds May 1



In the case where more than one Black Start Unit shares a common fuel tank, only one Black Start Unit will be eligible for the recovery of the MTSL in its fuel storage calculation. The MTSL for the other Black Start Unit(s) sharing the common fuel tank shall be zero.

$$\{(\text{Fixed BSSC}) + (\text{Variable BSSC}) + (\text{Training Costs}) + (\text{Fuel Storage Costs})\} * (1 + Z)$$

Z is the incentive factor solely for Black Start units with a commitment under Paragraph 5 of Schedule 6A

- Z = 10% (0% for Units on CRF Rates)

- 53 Black Start Units recovered Fuel Storage Costs which included MTSL
  - total recovered cost = \$546,406
  - average recovered cost = \$10,309
  - smallest recovered cost = \$160
  - largest recovered cost = \$77,892
  
- Recovered MTSL cost as a percentage of unit's total Fuel Storage Costs
  - average = 54%
  - smallest = 14%
  - largest = 93%

- Estimated Annual Revenue in 2016 for a 20 MW Oil Fired Combustion Turbine in Net CONE Area 1

- Fixed BSSC =  $20 * (\$345.20 * 365) * 0.02 = \$50,399$

- Variable BSSC (2016 average) = \$ 3,570

- Training Costs =  $50 * \$75/\text{Hour} = \$ 3,750$

- Fuel Storage =  $\$10,309 + [(16 * 1950) * (1.4 + 0.1) * 4.71\%] = \$12,381$

times (1+ 10%) (Incentive Factor) = \$70,100