

## PJM

### Black Start Fuel Assurance Proposal for Run of River and Pumped Storage Hydro

#### **Run Hour Requirements:**

Run of River and Pumped Storage Hydro will be able to choose between a 10 hour or 16 hour minimum run requirement (or as defined by TO restoration plan) at full load. Units on the Base Formula Rate may choose between a 10 hour or 16 hour minimum requirement with the following Tiered compensation options:

##### Tier 1

90% Confidence level for 16 hour minimum run requirement.

Allocation X factor = 0.02 and Incentive Z factor = 20%

Monthly validation: None

##### Tier 2

90% Confidence level for 10 hour minimum run requirement (or as defined by TO restoration plan)

Allocation X factor = 0.01 and Incentive Z factor = 10%

Monthly validation: If a 10 hour or greater minimum run requirement is used, a monthly verification will take place to determine if unit(s) could meet assigned MW requirement for 16 hour run time based on average monthly flow. If capable of meeting, Incentive Z factor increased to 20% for the month's Base Formula Rate.

Units will need to provide one years notice to switch tiers. New units on the Capital Recovery Rate will specify the Tier of service they will provide when they submit their initial proposal.

#### **Proposal for determining amount of Black Start MWs at a Hydro Station:**

Run of River Hydro with or without Storage shall use the daily volumetric inflow values for the past 20+ years from the appropriate USGS river flow gauges or other instrumentation agreed to by the Hydro Generation Owner and PJM with input from IMM to determine the maximum number of black start MW that can be supported for chosen minimum run hour requirement (10 or 16 hours). Run of River Hydro with storage can use the normal, daily starting elevation levels for storage values within licensing limits in the Black Start MW calculation with PJM concurrence. The Black Start MW calculation shall be based on river flows of 90% confidence level to correspond to the current average PJM CT Equivalent Availability Factor (e.g. - for a BS commitment of 100 MW assume 100 MW would be available, for either 10hrs or 16hrs, 90% of the time based on historical river flows and daily storage).

Pumped Storage Hydro shall maintain sufficient pond level to support either a 10 hour or 16 hour minimum run requirement (or as defined by the Transmission Owner commensurate with the TO restoration plan) at full load of the assigned black start MW.

**Black Start Annual Revenue Requirement for Hydro Units on the Base Rate Formula:**

**Current:**

Fixed Black Start Service Costs (Fixed BSSC) – OATT Schedule 6A, Section 5

$$\text{Formula} = ((\text{Net CONE} * \text{Black Start Unit Capacity} * X) + \text{Variable BSSC} + \text{Training}) * (1 + Z)$$

Net CONE = Current installed capacity (“ICAP”) net Cost of New Entry (\$/MW year) for the CONE Area where the Black Start Unit is located.

Black Start Unit Capacity = either (i) Black Start Unit’s installed capacity (MW); or (ii) awarded MW by the Transmission Provider

X = Black Start Service allocation factor (Black Start Units with a commitment established under Schedule 6A, Section 5, X shall be .01 for Hydro units and .02 for CT units)

Variable BSSC = Black Start O&M Costs including NERC Reliability Standard Compliance Cost

Training = Black Start Training Cost = \$3,750.

Z = Black Start Incentive Factor

**Propose changes for Hydro Black Start Resources:**

**Tier 1**

**90% confidence, 16 hour run time requirement**

X = .02 for 16 hour min run commitment = Net CONE \* Black Start Unit Capacity \* .02

Z factor = 20% for 16 hour min run commitment

**Example:** Hydro Resource 100 MW Black Start Commitment, Net CONE = \$264.40/MW-Day

| Run Hour | Current Formula Rate                | Fixed BSSC  |
|----------|-------------------------------------|-------------|
| 16 hours | 100 MW * \$264.40 * 365 days * 0.01 | \$96,506.00 |

Add Variable BSSC, Training Costs, and Incentive Factor Z:

Example 100 MWs Black Start Commitment, Net CONE = \$264.40, VOM = \$100,000

| Run Hour | Current Base Formula Rate                        | Fixed BSSC   |
|----------|--|--------------|
| 16 hours | (\$96,506 + (\$100,000 * 0.01) + \$3,750) * 1.10 | \$111,381.60 |

Proposed changes with an increased Allocation Factor to 0.02 and Incentive Factor Z to 20 percent

| Run Hour | Proposed Base Formula Rate                          | Fixed BSSC   |
|----------|---|--------------|
| 16 hours | $(\$193,012 + (\$100,000 * 0.01) + \$3,750) * 1.20$ | \$237,314.40 |

**Tier 2**

**90% confidence, 10 hour run time requirement (or as defined by the TO restoration plan)**

**X = .01 for 10 hour min run commitment = Net CONE \* Black Start Unit Capacity \* .01**

**Z = 10% for 10 hour min run commitment OR**

**Z = 20% for any calendar month where the unit is able to meet the assigned black start MW requirement for a 16 hour min run time based on average monthly flow.**

**Hydro Resources on the Base Formula Rate that have a different run hour commitment, as requested by the TO restoration plan, are eligible for the Base Formula Rate with an allocation factor X of .01 and Black Start Incentive Factor Z of 10%. No other incentives apply.**

**Example:** Hydro Resource 100 MW Black Start Commitment, Net CONE = \$264.40/MW-Day

| Run Hour | Current Formula Rate                                  | Fixed BSSC   |
|----------|---|--------------|
| 10 hours | $100 \text{ MW} * \$264.40 * 365 \text{ days} * 0.01$ | \$ 96,506.00 |

Add Variable BSSC, Training Costs, and Incentive Factor Z:

Example 100 MWs Black Start Commitment, Net CONE = \$264.40, VOM = \$100,000

| Run Hour | Current Base Formula Rate                          | Fixed BSSC   |
|----------|--|--------------|
| 10 hours | $(\$96,506 + (\$100,000 * 0.01) + \$3,750) * 1.10$ | \$111,381.60 |

Proposed changes with increased Incentive Factor Z to 20 percent

| Run Hour | Proposed Base Formula Rate                         | Fixed BSSC   |
|----------|--|--------------|
| 16 hours | $(\$96,506 + (\$100,000 * 0.01) + \$3,750) * 1.20$ | \$121,507.20 |

**\*\*\*Units must give one year notice to switch Tiers or MW commitment\*\*\***