



# MARKET MONITORING REPORT

Energy Market Committee  
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# Black Start Working Group

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# Black Start Working Group Issues

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- PJM presentation to EMC at May 1 meeting
- EMC vote at June 20 meeting
- MC vote at June 21 meeting



# What is Blackstart Generation?

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- Generating Unit that can start and synchronize to the system without having an outside (system) source of AC power
  - Generally Combustion Turbines or Hydro units
  - Critical for System Restoration
    - Starting point for restoring the power system following a complete System Shutdown
    - Used to provide start-up power to non-blackstart units
  - Critical that blackstart capability is tested and maintained to assure it is available when needed
  - Location-specific
  - Benefits all Transmission Customers



# Goal of the Blackstart Service WG

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- Incent existing critical blackstart capable units to continue to maintain the equipment, materials and talent required for this capability through cost-based compensation plus an incentive payment



# Elements of Blackstart Proposal

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- Restoration Assumptions
- Jurisdiction
  - How much blackstart capability is needed
- Product Description
  - Performance requirements
  - Testing
- Compensation
  - Compensation formula
  - Charge allocation



# Restoration Assumptions

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- Transmission Customers must purchase blackstart service
- Local Control Centers (LCC) are responsible for identifying blackstart units critical for System Restoration
  - With PJM oversight and approval
  - LCC deploys blackstart capability as needed during system restoration



# Product Description

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- Commitment
  - Initial 3 year commitment with annual right to terminate by each party (upon fulfillment of remainder of 3 year commitment)
  - All succeeding annual commitments must be at least an additional year to maintain a rolling 3 year commitment.
    - Any changes in cost will commence in the third year of commitment





# Product Description

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- Performance Standards
  - Ability to self-start without any outside source of power
  - Close unit onto a dead bus within 90 minutes of request to start
  - Ability to run for 16 hours or as defined by LCC restoration plan
  - Maintain frequency and voltage under varying load
  - Maintain black start procedures for each unit



# Product Description

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- Testing
  - Annual blackstart tests
    - Scheduled at generation owner's discretion with PJM approval
  - All blackstart units must be tested within 6 months of blackstart service implementation
  - Failed tests
    - 10 day grace period
    - Revenue then forfeited until test is passed
  - Test documentation submitted to PJM

# Blackstart Charges

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{ (Fixed Blackstart Costs)

+ (Variable Blackstart Costs)

+ (Training Costs)

+ (Fuel Storage & Carrying Costs)}

\* (1 + Incentive Factor)



# Blackstart Charges

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- Fixed Blackstart Costs:

$$\text{CDR} * 365 * \text{Unit Capacity} * X$$

- CDR = PJM Capacity Deficiency Rate
- Unit Capacity = Installed Capacity
- X = Fixed cost factor for blackstart
  - Hydro = 0.01
  - Diesel/CT = 0.02



# Blackstart Charges

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- Variable Blackstart Costs

Unit Variable O&M \* Y

- Y is O&M that is attributed to Blackstart
- $Y = 0.01$  unless supported by documentation
  - $(1-Y)$  must be applied to the unit's O&M costs on the units cost-based energy schedule



# Blackstart Charges

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- Training Costs:

50 staff hours/year/facility \* \$75/hour



# Blackstart Charges

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- Fuel Carrying Costs (for fuels requiring storage)

(Estimated Blackstart Run hours) \* (Fuel burn rate) \* (12 Month Forward Strip + Basis) \* (Bond Rate)

- 12 month forward strip = average forward price of unit's fuel
- Basis = transportation cost to blackstart unit
- Bond Rate = Representative interest rate
- Fuel carrying costs, not fuel product



# Blackstart Charges

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- Incentive Factor

$$Z = 10\%$$

- All blackstart costs are multiplied by incentive factor





# Blackstart Charges

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- Charges
  - Zonal rates based on blackstart capability within zone
  - Allocated to point-to-point customers based on monthly peak usage
  - Remaining revenue requirement in each zone is allocated to network customers serving load in that zone based on monthly peak loads
  - Charge allocation identical to Reactive Support and Voltage Control Service



# Estimated Black Start Cost

Zone	MW	Black Start Annual Cost (000)	Annual Cost	
			Per Zone Peak MW	Per BS MW
AE	312	\$447.4	\$186	\$1,434
APS	83	\$100.6	\$12	\$1,211
BC	370	\$541.4	\$86	\$1,463
DP	172	\$274.2	\$76	\$1,594
JC	306	\$283.9	\$54	\$928
ME	266	\$407.7	\$169	\$1,533
PE	830	\$842.0	\$110	\$1,014
PEP	157	\$228.7	\$38	\$1,456
PL	130	\$163.6	\$25	\$1,258
PN	488	\$393.4	\$151	\$806
PS	751	\$1,098.6	\$114	\$1,463
<b>Total</b>	<b>3,865</b>	<b>\$4,781.5</b>	<b>\$79</b>	<b>\$1,237</b>



# Blackstart and Transmission Rates

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- MMU needs to determine if any blackstart costs are included in current transmission rates
- Discussions with TOA AC
- Review filing documents
- May request further documents from TOs



# Market Monitoring Organization WG

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# Market Monitoring Plan

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- PJM Market Monitoring Plan is part of the OATT
  - Only PJM may make section 205 filings to modify Plan
- PJM Board of Managers will consider proposals regarding the structure of the Market Monitoring Unit
- PJM may make a FERC filing to implement any appropriate changes



# Market Monitoring Organization WG

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- Defined matrix of issues with status quo and three basic positions
- Limited sectoral representation at MMOWG meetings
- Basic Issues:
  - Structure of Board monitoring oversight committee
  - Is market monitoring internal or external
  - Reporting relationship of MMU head with PJM
  - Hiring/firing authority
  - Status of MMU head
  - Authority of MMU head
  - Who holds Section 205 rights



# Market Monitoring Organization WG

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- Status Quo:
  - Committee of Board provides oversight of market monitoring
  - MMU part of PJM
  - MMU reports to CEO and Board
  - CEO hires/fires head of MMU
  - MMU head has authority per Market Monitoring Plan
  - Board has Section 205 rights
- Group B: (Public advocates)
  - Committee of Board provides oversight of market monitoring
  - MMU part of PJM
  - MMU reports to CEO and to Board
  - CEO and Board hire/fire head of MMU
  - MMU head is executive level position
  - MMU head has authority per Market Monitoring Plan
  - Board has Section 205 rights



# Market Monitoring Organization WG

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- Group A: (Generator proposal)
  - Separate Board Market Monitoring Committee (MMC)
  - MMU part of PJM
  - MMU reports to MMC only
  - MMC hires/fires head of MMU
  - MMU head is executive level position
  - MMC has Section 205 rights
- Group C: (Generator proposal)
  - Separate Market Monitoring non-profit company
  - MMU not part of PJM
  - Separate Market Monitoring Board (MMB)
  - MMB hires/fires head of MMU
  - MMU head is executive level position
  - MMB has all rights under Market Monitoring Plan
  - MMB has Section 205 rights





# Issues

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- Need to organize WG on transmission requirements for import of capacity resources (per prior EMC meeting)
- WG on application of options theory to pricing of day ahead risk for cost capped units (per MIWG meeting)



# Monthly Fuel Cost Data Reporting

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