VOM Package Review and M15 Redlines

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#1 Monthly Operating Costs Submittal

Correct OA 4.4(c) to twelve month to sixty month rolling average

Add to M15:

1) Market Sellers that elect to use monthly rolling average shall submit the operating cost adder value to PJM & IMM via COA monthly if no cost items change;

2) If cost items change, Market Sellers must also submit a new operating cost template to PJM

- Section 2.6.8:

  - Market Sellers that elect to use monthly rolling average shall submit the operating cost adder value to PJM and IMM via COA monthly if no cost items change; If cost items change, Market Sellers must also submit a new operating cost template to PJM and IMM.

#2 Maintenance History

Add to M-15:

1) For immature units (new units with less than 10 years of operating history), maintenance costs, operating costs and operating history must correspond to the number of years for which supporting documentation is available.

2) For mature units that transferred ownership, the new owner should include maintenance and operating costs for which supporting documentation is available. Operating history must reflect at least 10 (up to 20) years.

2.6.7 Immature Units: Maintenance Costs

Immature Units - Units with neither 10 years of operation nor 50,000 Operating Hours.

Immature Units should use actual available costs. Maintenance costs, operating costs and operating history must correspond to the number of years for which supporting documentation is available.

use all available history to calculate the Maintenance Adder. For mature units that transferred ownership, the new owner should include maintenance and operating costs for which supporting documentation is available. Operating history must reflect at least 10 (up to 20) years.

#3a Multiple Maintenance Adders

Add to M15:

1) If Market Sellers use multiple adders for the same unit(s), they must split the total maintenance costs between templates with different unit of measure to prevent double counting

3) Multiple adders cannot be used unless LTSA or OEM documentation allows multiple units of measure for maintenance milestone

~~reviewed (and updated if changed) at least annually.~~ Maintenance Adders may be included as part of the start cost, no load, or incremental energy offer. Maintenance Adders may be specified as $/Start, $/Hour, $/MMBtu, $/Equivalent Service Hour (ESH), and/or $/MWh. Multiple Maintenance Adders cannot be used unless multiple variable maintenance payment criteria (specified in both starts and hours or starts/hours ratios, etc.) specified in LTSA (see 2.6.10). If multiple Maintenance Adders are used for the same unit(s), the total maintenance costs must be split into multiple Maintenance Adders to prevent double counting.

#3a Multiple Maintenance Adders

2) In accordance with LTSA, adder format shall be consistent with the maintenance expense and is a function of units starts or run hours. For example, if the maintenance expenses are a function of starts, the maintenance adder shall be in $/start.
4) Units that have LTSA or OEM documentation which specifies N-Ratio (i.e. run hours divided by number of starts) for maintenance payments will apply those in consistent manner in annual submittals (include an example in the manual)

2.6.10 Maintenance Adder with LTSA

When LTSA costs are included, the Market Seller shall use the format of adder consistent with the variable maintenance payment criteria (i.e. $/starts, $/hours, etc.) specified in LTSA.

The adder format shall be consistent with the maintenance expense and is a function of units starts or run hours. For example, if the maintenance expenses are a function of starts, the Maintenance Adder shall be in $/start.

Units that have LTSA or OEM documentation which specifies N-Ratio (i.e. run hours divided by number of starts) for maintenance payments will apply those in consistent manner in submitting Maintenance Adder. For example, a Market Seller allocates the dollars charged based on starts and divide by total starts to get a $/start adder; and allocates the other dollars charge based on hours and divide by total hours to get a $/hour adder.

#3b Adders for Similar Units

Add to M15:

1) Market Sellers can use one template for multiple units at the same plant only if units are the same technology type, such as aero-derivative CT.

2) Market Sellers that submit one template for multiple units must include total operating history for all units (for example, total operating hours for unit 1 plus total operating hours for unit 2 plus total operating hours for unit 3)

Section 2.6:

A Market Seller may submit a Maintenance Adder including all maintenance costs if the unit does not have a default minor maintenance adder for its technology type. A Market Seller with tolling agreement must use zero for the default minor maintenance adder, but may include the variable tolling fees in the Maintenance Adder.

#3c Adders for Units with LTSAs

Add to M15:

When LTSA costs included, Market seller shall use the format of adder consistent with the maintenance milestone specified in LTSA

2.6.10 Maintenance Adder with LTSA

When LTSA costs are included, the Market Seller shall use the format of adder consistent with the variable maintenance payment criteria (i.e. $/starts, $/hours, etc.) specified in LTSA.

#3d Use of Cyclic Factors

Add to M15:

1) Market Sellers can only use cyclic factors with maintenance adders with ESH

2) Market Sellers can only use LTSA or OEM specified cyclic factors

3) Cyclic factors can only be applied to simple cycle or combined cycle CT major maintenance costs (for example, LTSA for CT major overhaul costs)

4) Add new cyclic fuel factor if specified in the LTSA or OEM

5) Market Sellers can use multiple cyclic peaking factors if specified in the LTSA or OEM

Section 2.6.6

Note:
Cyclic Starting Factors and Cyclic Peaking Factors can be used only when the maintenance adder is in $/ESH and the values can be supported by LTSA or OEM. They shall be consistently used for equivalent service hours and cost based offer calculations for simple cycle or combined cycle CT major maintenance costs only. Cyclic Fuel Factors can be used in the calculation of ESH if specified in the LTSA or OEM. Multiple cyclic peaking factors can be included in the calculation of ESH if specified in the LTSA or OEM. Cyclic Starting Factors and Cyclic Peaking Factors values shall be consistently used for equivalent service hours and cost based offer calculations for CC and CT Units. See cyclic starting factor and cyclic peaking factor in sections 5.6.3 & 6.6.3.

#4 Ancillary Services VOM

- Regulation VOM change will be moved to the matrix for Regulation Market Design Senior Task Force
- Synchronized Reserve VOM is in the Reserve Price Formation conforming M-15 Manual update.

#5a Allowable Expenses on Systems Directly Related to Electric Production

1) Allowable expenses include only major maintenance costs, which are variable costs that vary directly with the electric production, such as run hours or starts, and can be related to any major overhaul or inspection of a boiler, reactor, heat recovery steam generator, steam turbine, gas turbine, hydro turbine, generator, or engine. Both capital and expense costs including major maintenance are allowable.

2) Examples of major maintenance:

3) Major maintenance included in the VOM template is submitted for PJM/IMM review

2.6.1.1 Major Maintenance

Major maintenance are variable costs that vary directly with the electric production, such as run hours or starts, and can be related to any major overhaul or inspection of boiler, reactor, heat recovery steam generator, steam turbine, gas turbine, hydro turbine, generator, or engine. Both capital and expense costs including major maintenance are allowable.

~~(a)~~ Major ~~inspections and overhauls of gas turbine and steam turbine generators~~ maintenance include, but are not limited to, the following costs:

- turbine blade repair/replacement;
- turbine diaphragm repair;
- turbine casing repair/replacement;
- turbine bearing repair/refurbishment;
- turbine seal repair/replacement and generator refurbishment;
- ~~heat transfer replacement and cleaning;~~
- ~~cooling tower fan motor and gearbox inspection;~~
- ~~cooling tower fill and drift eliminators replacement;~~
- Selective Catalytic Reduction and CO Reduction Catalyst replacement;
- ~~Reverse Osmosis Cartridges replacement;~~
- ~~air filter replacement;~~
- ~~fuel and water pump inspection/replacement.~~

~~(b) Major maintenance of gas turbine generators directly related to electric production include, but are not limited to:~~

- compressor blade repair/replacement;
- hot gas path inspections, repairs, or replacements;

~~(c) Major maintenance of steam turbine generators directly related to electric production include, but are not limited to:~~

- steam stop valve repairs;
- steam throttle valve repairs;
- steam nozzle block repairs;
- steam intercept valve repairs;
- generator stator or rotor rewind, refurbishment, or replacement;
- scrubber refurbishment;
- water wall panel replacement;
- pendant or super heater replacement;
- economizer replacement;
- diesel/reciprocating engine overhaul;
- reactor refueling;
- steam generator overhaul/replacement.

#5b Unallowable Expenses on Systems Directly Related to Electric Production

Apply the following changes to OA schedule 2, 4.1(d) and M15:

Maintenance Costs that cannot be included in a Market Seller's cost-based offer are:

a) time-based, preventative, or routine maintenance on any systems, and

b) any maintenance on systems not directly related to electric production like buildings, HVAC, compressed air, closed cooling water, heat tracing/freeze protection, control room equipment and software, reactor safety system and water treatment.

2.6.1.3 Unallowable Expenses

Maintenance Costs that cannot be included in a unit's cost-based offer are time-based, preventative maintenance, ~~and~~or routine maintenance on any systems.~~,~~ Also unallowable are any costs associated with~~and~~ any maintenance on systems not directly related to electric production ~~auxiliary equipment~~ like buildings, HVAC, compressed air, closed cooling water, heat tracing/freeze protection, control room equipment and software, reactor safety system and water treatment. Typically, if the system is needed to remain in-service when the unit is not in operation expenses related to it cannot be included in a unit's cost based offer.

#6 Annual VOM Review Process

1) Remove annual review for units that have default adders.

2) Expiration dates will be provided upon adder approval

3) OA Schedule 2 clean-up. Remove the reference to annual FCP review in section 4.4 (d) and section 3.1(b)

production based on operating hours, starts, or a combination of operating hours and starts qualify for inclusion. Fixed costs cannot be included. ~~The Maintenance Adder should be reviewed (and updated if changed) at least annually.~~ Maintenance Adders may be included as part of the start cost, no load, or incremental energy offer. Maintenance Adders may be

approved Maintenance Adder in their unit's cost-based offer. ~~Approved Maintenance adders expire December 31 of the year following acceptance.~~ The expiration date of a PJM-approved Maintenance Adder shall be provided upon new adder approval. Upon the transfer of ownership

~~acceptance.~~ The expiration date of a PJM-approved Operating Costs shall be provided upon new adder approval. Upon the transfer of ownership to a new Market Seller, the new Market

#6a Submission/Review Timeline

For the year that adder expires:

1) Market Sellers submit VOM template and supporting documentation in MIRA by March 31,

2) IMM performs the initial review and provides determinations to Market Sellers and PJM by August 31, and PJM shall make the final approval decisions by December 31.

The Maintenance Adder or Operating Costs and corresponding supporting documentation shall be submitted to the MMU by March 31 for the year that adder expires; The MMU shall perform the initial review and provide determinations to the Market Seller and PJM by August 31. PJM shall make the final approval decisions by December 31.

#7a Level of detail of documentation

Add to M15:

1) Supporting documentations may be in the format of maintenance management system records, general ledger data, accounting records or invoices and clearly show how each cost submitted for review was calculated

2) Supporting documentations for maintenance expenses shall include the work order and/or description of maintenance activities performed

3) Supporting documentations for operating costs shall include the amount of each consumable used while in operation, and the cost per unit of each consumable

4) VOM templates and supporting documentation must be linked and traceable.

2.6.9 Supporting Documentations

The supporting documentations for the Maintenance Adder and Operating Costs template may be in the format of maintenance management system records, general ledger data, accounting records or invoices. The VOM templates and supporting documentation must be linked and traceable. The supporting documentation must clearly show how each cost items included in the template was calculated.

Supporting documentations for maintenance expenses shall include the work order and/or description of maintenance activities performed.

Supporting documentations for operating costs shall include the amount of each consumable used while in operation, and the cost per unit of each consumable.

#7b Number of years of documentation

Add to M15:

Supporting documentation must be submitted for all major maintenance costs included on the template for all years.

The Maintenance Adder is based on the actual maintenance expense history of the unit for the defined Maintenance Period (See 2.6.~~3~~4) and must be justified with supporting documentation. The Market Seller shall ~~retain and make available to PJM and/or the Market Monitor when requested such~~ submit supporting documentation (see 2.6.9) for all costs that are included in the unit's historical Maintenance Period. Only expenses incurred as a result of electric production based on operating hours, starts, or a combination of operating hours and starts

#8a Default VOM Adders

1) Establish default maintenance adder that includes only minor maintenance costs. Market Sellers that wish to include minor maintenance costs can only use the defaults values.

2) Calculate default values for Operating Costs. Market Sellers may use the calculated default values for Operating Costs and shall not be required to submit operating costs templates or supporting documentations for review if using the default

3) Market Sellers shall submit a maintenance adder template only including major maintenance. Market Sellers shall submit for the first year and any of the subsequent years when major maintenance adds to or rolls off from selected maintenance history. Regardless of when the maintenance is completed the template will include a minimum of 10 years of operating history.

4) Market Sellers seeking higher Operating Costs adder than the default shall be required to submit operating costs templates and supporting documentations for review

5) Market Sellers with tolling agreement must use zero for the default minor maintenance adder, but may include the variable tolling fees in the major maintenance adder template.

#8a Default VOM Adders

A Market Seller may only submit major maintenance costs for review for units that have a default minor maintenance adder calculated by PJM/IMM (see 2.6.11). The major maintenance costs shall be submitted when major maintenance added to or removed from the maintenance period. The default minor maintenance adder may be included in the cost-based energy offer. Regardless of when the maintenance is completed, the major Maintenance Adder shall include a minimum of 10 years of operating history. The expiration date shall be provided upon new adder approval. Market Sellers may only use the PJM-approved major Maintenance Adder in their unit's cost-based offer plus the default Minor Maintenance Adder for unit's technology type. Market Sellers cannot submit Minor Maintenance for review if the unit has a calculated default minor maintenance adder. Market Sellers that are using the default minor maintenance adder for Black Start service units shall not use 1% of the total maintenance dollars as part of their black start service annual revenue requirement.

A Market Seller may submit a Maintenance Adder including all maintenance costs if the unit does not have a default minor maintenance adder available for its technology type. A Market Seller with tolling agreement must use zero for the default minor maintenance adder, but may include the variable tolling fees in the Maintenance Adder.

A Market Seller may include a default operating costs adder (see 2.6.11) in the cost-based energy offer and shall not be required to submit Operating Costs for review. If the Market Seller elects not to use the default operating costs adder, or the unit does not have a default operating costs adder available for its technology type, the Market Seller must submit t~~T~~he Operating Costs ~~must be submitted~~ to PJM and the MMU for review annually, in accordance with Operating Agreement Schedule 2 Section 4. Market Sellers may only use the PJM-approved Operating Costs in their unit's cost-based offer if not using a default operating costs. ~~Approved Operating Costs expire December 31 of the year following acceptance.~~ The expiration date of a PJM-approved Operating Costs shall be provided upon new adder approval. Upon the transfer

#8b Calculation Method for Default Adders
#8c Default Adders Update Frequency
#8f Unit of Measure for Default Minor Maintenance Adder

#8b PJM and the IMM will calculate default minor maintenance adders based on historical values submitted in the 2021 VOM review for each technology type:

- CT
- CC
- Steam
- diesel

Other technology types that do not have a PJM calculated default minor maintenance adder may submit a maintenance adder template to include all major and minor maintenance costs

#8c: Escalated annually using Handy-Whitman Index

#8f: The default minor maintenance adder shall be in $/MWh for all units

#8b Calculation Method for Default Adders
#8c Default Adders Update Frequency
#8f Unit of Measure for Default Minor Maintenance Adder

2.6.11 Default Adders

A Market Seller may only submit major maintenance costs for review for units that have a default minor maintenance adder. The major maintenance costs shall be submitted when major maintenance added to or removed from the maintenance period. The default minor maintenance adder may be included in the cost-based energy offer. PJM will approve the major maintenance costs with timely input from the Market Monitoring Unit. Technology types for which a default minor maintenance adder is not calculated may submit major and minor maintenance costs for PJM and the Market Monitoring Unit review.

A Market Seller may include a default operating costs adder in the cost-based energy offer and shall not be required to submit Operating Costs for review.

The initial values of the default adder are as the followings:

Technology Type	Default Minor Maintenance Adder ($/MWh)	Default Operating Costs Adder ($/MWh)
CT		
CC		
Steam		
Diesel		

The default adders shall be escalated utilizing the Handy Whitman Index and published annually by PJM and the Market Monitoring Unit.

#8d Definition of Major Maintenance

2.6.1.1 Major Maintenance

Major maintenance are variable costs that vary directly with the electric production, such as run hours or starts, and can be related to any major overhaul or inspection of boiler, reactor, heat recovery steam generator, steam turbine, gas turbine, hydro turbine, generator, or engine. Both capital and expense costs including major maintenance are allowable.

~~(a)~~ Major ~~inspections and overhauls of gas turbine and steam turbine generators~~ maintenance include, but are not limited to, the following costs:

- turbine blade repair/replacement;
- turbine diaphragm repair;
- turbine casing repair/replacement;
- turbine bearing repair/refurbishment;
- turbine seal repair/replacement and generator refurbishment;
- ~~heat transfer replacement and cleaning;~~
- ~~cooling tower fan motor and gearbox inspection;~~

#8e Definition of Minor Maintenance

2.6.1.2 Minor Maintenance

Minor maintenance includes but is not limited to, repairs and replacements on equipment directly related to electric production such as the following costs:

- heat transfer replacement and cleaning;
- cooling tower fan motor and gearbox inspection;
- cooling tower fill and drift eliminators replacement;
- air filter replacement;
- valves & piping components, control equipment, pumps, motors, condenser components, transformers, cabling, breakers, motor control centers, switch gear, fuel & ash handling, SCR & Scrubber emission control equipment and components, mills burners, boiler components, fan components, reactor recirculation compnents, hydraulic control rod drive system components and reactor components.

Black Start service units using default maintenance adders shall not use 1% of maintenance dollars as part of their black start service annual revenue requirement.

A Market Seller may only submit major maintenance costs for review for units that have a default minor maintenance adder calculated by PJM/IMM (see 2.6.11). The major maintenance costs shall be submitted when major maintenance added to or removed from the maintenance period. The default minor maintenance adder may be included in the cost-based energy offer. Regardless of when the maintenance is completed, the major Maintenance Adder shall include a minimum of 10 years of operating history. The expiration date shall be provided upon new adder approval. Market Sellers may only use the PJM-approved major Maintenance Adder in their unit's cost-based offer plus the default Minor Maintenance Adder for unit's technology type. Market Sellers cannot submit Minor Maintenance for review if the unit has a calculated default minor maintenance adder. Market Sellers that are using the default minor maintenance adder for Black Start service units shall not use 1% of the total maintenance dollars as part of their black start service annual revenue requirement.

#9 Operating Costs examples

1) Add ash disposal and waste disposal in 2.6.8 operating costs examples
2) Move leased fuel transportation equipment from 2.2.6 to 2.6.8

- Allowable Operating Cost include lubricants, chemicals, Limestone, Trona, Ammonia, acids, caustics, water injection, ~~and~~ demineralizers, ash disposal, and waste disposal. Operating Cost also include variable Title V and other applicable emissions fees.

2.6.8.1 Leased Fuel Transportation Equipment

Leased Fuel Transportation Equipment Cost –Expenses incurred using leased equipment to transport fuel to the plant gate.

Only the leased equipment costs that vary with the electric production can be included in the Operating Costs. If the costs are fixed, they must be excluded. If the costs are based on a charge for every unit of fuel delivered, such costs should be included in the fuel costs and not included in Operating Costs.

Contact

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