



# Summary of Cost Development Subcommittee Variable Operation and Maintenance Costs (VOM) Packages

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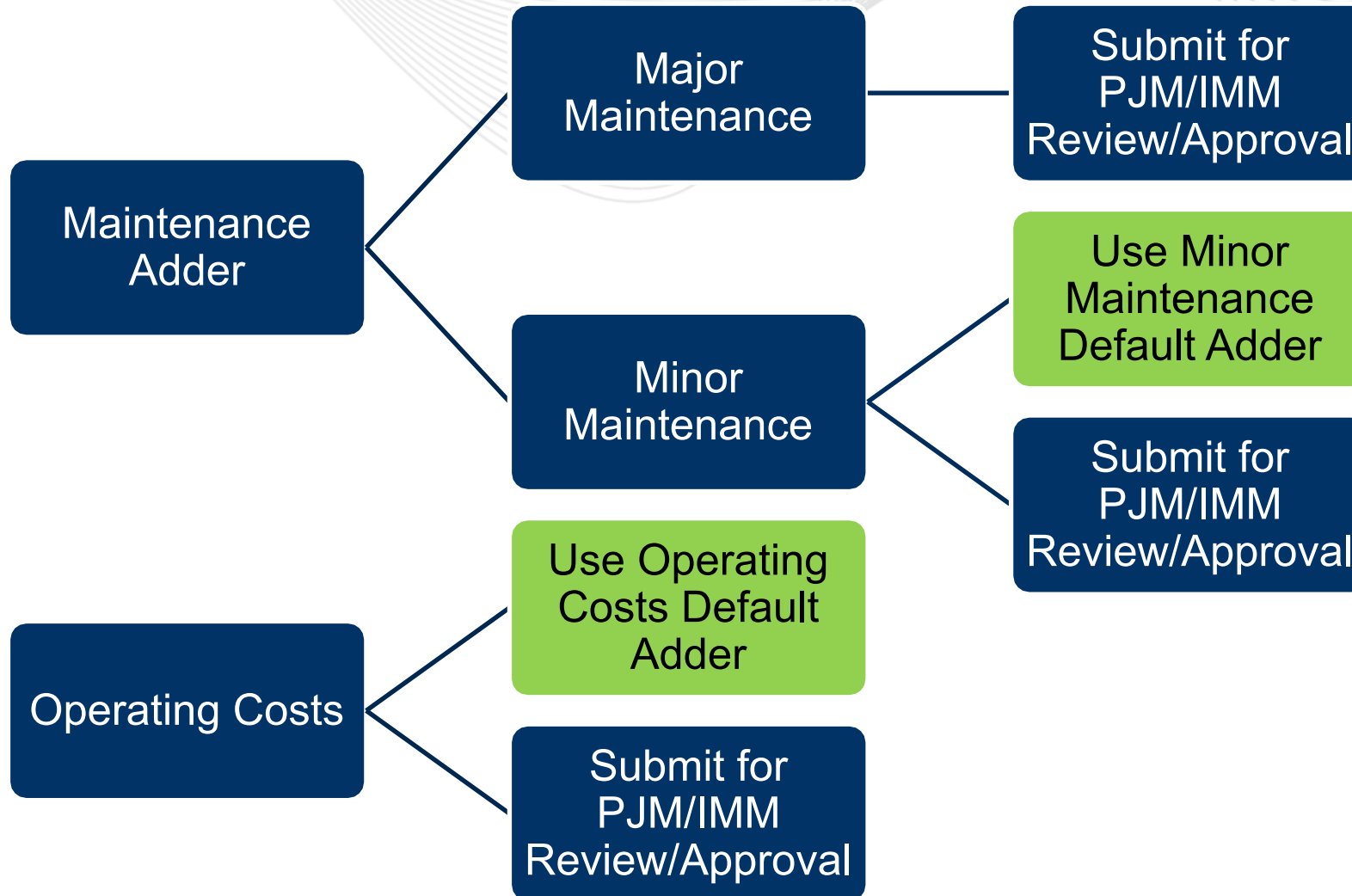
## Key Work Activities and Scope

Provide detailed guidance and updates, as necessary, in Manual 15 and Schedule 2 of the Operating Agreement for:

- 1) Clarifications for Market Sellers who use monthly operating costs
- 2) Years of available operating history and clarifications for situations where documentation is unavailable for immature units
- 3) The use of multiple maintenance adders and units of measure (e.g. \$/hour or \$/start) for LTSA costs
- 4) Clarifications around averaged maintenance adders for similar units
- 5) Clarifications for the use of VOM in all ancillary services (e.g. synchronized reserves, condensing costs, regulation)
- 6) The need for changes to Manual 15's list of system that are directly related to electric production
- 7) The annual VOM review process around
  - a. Coordination of PJM and IMM reviews
  - b. Acceptable levels of documentation
- 8) Research and recommendations related to the use of default VOM adders

- CDS has developed two packages for consideration of the MIC:
  - PJM Package
  - Constellation Package
- The two packages agree on a number of VOM related changes to OA Schedule 2 and M15, however the packages deviate around:
  - Allowable/Unallowable expenses

- Default Adders for Minor Maintenance and Operating Costs
- New Submission/Review Process and timeline
- Clarified Definitions:
  - Major Maintenance
  - Minor Maintenance
  - Unallowable Expenses
- Clarified Requirements on Supporting documentation



- New process for using the default adders:
  - Remove annual review
    - If using minor maintenance default adder, submit maintenance adder only when major maintenance added to or rolled off from the maintenance period
    - If using operating costs default adder, no need to submit operating costs.
  - Expiration dates will be provided upon adder approval
- Timeline:
  - For the year that adder expires:
    - Submit template and supporting documentation to PJM/IMM by March 31;
    - PJM final approval by December 31.

- Intended to represent minor maintenance and operating costs
- Calculated based on historical values submitted to PJM
- In \$/MWh for all units
- Escalated annually using Handy-Whitman Index
- No use of 1% of maintenance dollars for BSS revenue requirement

Technology Type	Minor Maintenance Default Value (\$/MWh)	Operating Costs Default Value (\$/MWh)
Combined Cycle	0.98	0.40
Combustion Turbine	3.59	0.75
Reciprocating Engine	4.03	1.62
Fossil Steam	1.71	2.87

## 2.6.1.1 Major Maintenance

Major maintenance are overhaul, repair, or refurbishment that requires disassembly to complete of boiler, reactor, heat recovery steam generator, steam turbine, gas turbine, hydro turbine, generator, or engine.

## 2.6.1.2 Minor Maintenance

Minor maintenance are repair or refurbishment on equipment and components directly related to electric production and not otherwise classified as major maintenance, such as main steam, feed water, condensate, condenser, cooling towers, transformers, gas turbine inlet air and exhaust, and fuel systems.

## 2.6.1.3 Unallowable Expenses

Maintenance costs that cannot be included in a unit's cost-based offer are time-based, preventative maintenance, or routine maintenance on any equipment. Also unallowable are any maintenance costs that do not vary with the electric production, such as buildings, HVAC, compressed air, closed cooling water, heat tracing/freeze protection, control room equipment and software, reactor safety system and water treatment.





# Differences Between the Two Packages

PJM	Constellation
<p>1) Allowable expenses include only major maintenance costs for units that have default minor maintenance adder, Major maintenance are overhaul, repair, or refurbishment that requires disassembly to complete of boiler, reactor, heat recovery steam generator, steam turbine, gas turbine, hydro turbine, generator, or engine.</p> <p>2) Examples of major maintenance include:</p> <ul style="list-style-type: none"><li>• turbine blade repair/replacement;</li><li>• turbine diaphragm repair;</li><li>• turbine casing repair/replacement;</li><li>• turbine bearing repair/refurbishment;</li><li>• turbine seal repair/replacement;</li><li>• steam stop, throttle, or intercept valve repairs;</li><li>• nozzle block repairs</li><li>• generator stator or rotor rewind, refurbishment, or replacement;</li><li>• compressor blade repair/replacement;</li><li>• hot gas path inspections, repairs, or replacements</li><li>• Selective Catalytic Reduction and CO Reduction Catalyst replacement;</li><li>• scrubber refurbishment;</li><li>• water wall panel replacement;</li><li>• pendant or super heater replacement;</li><li>• economizer replacement;</li><li>• diesel/reciprocating engine overhaul.</li><li>• Reactor refueling</li><li>• Steam generator overhaul/replacement</li></ul> <p>3) Major maintenance included in the VOM template is submitted for PJM/IMM review</p> <p>4) Both capital and expense costs are allowable.</p>	<p>1) Allowable expenses include only major maintenance costs for units that have default minor maintenance adder, Major maintenance are overhaul, repair, or refurbishment that requires disassembly to complete of boiler, reactor, heat recovery steam generator, steam turbine, gas turbine, hydro turbine, generator, or engine.</p> <p>2) Examples of major maintenance include:</p> <ul style="list-style-type: none"><li>• turbine blade repair/replacement;</li><li>• turbine diaphragm repair;</li><li>• turbine casing repair/replacement;</li><li>• turbine bearing repair/refurbishment;</li><li>• turbine seal repair/replacement;</li><li>• steam stop, throttle, or intercept valve repairs;</li><li>• nozzle block repairs</li><li>• generator stator or rotor rewind, refurbishment, or replacement;</li><li>• compressor blade repair/replacement;</li><li>• hot gas path inspections, repairs, or replacements</li><li>• Selective Catalytic Reduction and CO Reduction Catalyst replacement;</li><li>• scrubber refurbishment;</li><li>• water wall panel replacement;</li><li>• pendant or super heater replacement;</li><li>• economizer replacement;</li><li>• diesel/reciprocating engine overhaul.</li><li>• <del>Reactor refueling</del></li><li>• Steam generator overhaul/replacement</li></ul> <p>3) Major maintenance included in the VOM template is submitted for PJM/IMM review</p> <p>4) Both capital and expense costs are allowable.</p> <p>5) Notwithstanding the foregoing, for the purposes of this provision, nuclear refueling and associated major maintenance are considered fixed costs not directly attributed to the production of energy and therefore not includable in VOM.</p>

- Level of details:
  - Clearly show how each cost was calculated, may be in the format of maintenance management system records, general ledger data, accounting records or invoices
  - Include the work order and/or description of maintenance activities performed
  - Include the amount of each consumable used while in operation, and the cost per unit of each consumable
  - Templates and supporting documentation must be linked and traceable.
- Number of years:
  - All years included in the history

- The PJM Package proposes a number of changes to M15 to provide additional guidance and/or clarification on:
  - Maintenance history
  - Multiple maintenance adders
  - Adders for similar units
  - Adders for units with LTSAs
  - Use of cyclic factors
  - Ancillary services VOM
  - Monthly operating costs submittal
  - Operating costs examples

1. Can you support the PJM package for VOM?

	#	%
Yes	78	76%
No	25	24%
Abstain	0	

2. Can you support the Constellation package for VOM?

	#	%
Yes	51	50%
No	50	50%
Abstain	2	

3. Do the minor maintenance and operating cost defaults seem reasonable for the technology classes?

	#	%
Yes	98	95%
No	5	5%

4. Would you use the minor maintenance and operating cost defaults?

	#	%
Yes	87	84%
No	16	16%

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## Summary of CDS VOM Packages



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