

# Update on Response to Effective Load Carrying Capability (ELCC) Deficiency Letter

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PJM Markets and Reliability Committee  
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Q	Description	Response Format
1	Method related to intermediate step of ELCC algorithm	Submit revised RAA language for 1a
2	“Floor” handling if class is redefined	Submit revised RAA language
3	“Floor” details: arithmetic behind supporting floors; how are groupings determined; what if the entire ELCC Portfolio cannot support floors.	Submit revised RAA language for 3d
4	Capacity Interconnection Rights: interaction of status quo with ELCC policy	Narrative answer
5	Why not implement ELCC framework for a Delivery Year after its Base Residual Auction?	Narrative answer
6	Preliminary ELCC results	Numerical answer
7	Can hybrids participate as two resources?	Additional detail

*“In your filing, you state that PJM will utilize an ELCC analysis to allocate the ELCC Portfolio Unforced Capacity (UCAP) amongst ELCC Classes, “such that the aggregate of all ELCC Class UCAP values is equal to the ELCC Portfolio UCAP.” Affiant Dr. Rocha Garrido further explains that, while the ELCC Portfolio UCAP is an unambiguous value, the allocation of this value amongst ELCC Classes is a heuristic that requires multiple additional ELCC runs and generally includes: (1) determination of ELCC for each ELCC Class in the absence of all other ELCC Classes (ELCC “First-In” runs); (2) determination of ELCC for each ELCC Class in the presence of all other ELCC Classes (ELCC “Last-In” runs); and (3) use of the First-In and Last-In runs to allocate the ELCC Portfolio UCAP value and establish the ELCC Class UCAP values. The corresponding proposed RAA language states that “[t]he ELCC Portfolio UCAP shall be allocated to each ELCC Class UCAP, in accordance with the applicable [ELCC] analysis methodology specified in the PJM Manuals. . . .”*

*a. Please describe the methodology PJM will use to allocate the ELCC Portfolio UCAP amongst ELCC Classes to establish the ELCC Class UCAP values and ELCC Class Ratings, including how the results of the First-In and Last-In runs for each ELCC Class will be used. Please include a detailed explanation of any relevant formulas or procedures.”*



## Q1: Method related to intermediate step of ELCC algorithm

### ANSWER:

- PJM will use the Delta method. See CCSTF materials: <https://www.pjm.com/-/media/committees-groups/task-forces/ccstf/2021/20210218/20210218-item-02-delta-method.ashx>

*“In your filing, you note that both tracking and fixed-tilt solar resources might share an ELCC Class. If PJM were to initially include these resources in the same ELCC Class, and then treat them as belonging to two different classes at some point in the future, please explain how this would affect the calculation of ELCC Class UCAP, ELCC Class Rating, and ELCC Class Rating floor values. How would the transition mechanism apply to resources that may be moved into a different ELCC Class than the one that was used to establish the ELCC Class Rating floors for their annual cohort?”*

ANSWER = modify the floors.



## Example for Question 2: Floor Handling If Class Is Redefined

- If tracking solar and fixed solar share a class, and the class is dominated by tracking solar, then the Class Rating could be quite high, for example 60%.
- Note that the weighted average ELCC Performance Adjustment for a class is always 100% by definition.
- **A fixed solar unit in a combined solar class would be expected to have a relatively low Performance, for example: 65%. In that case, its final Accredited UCAP value would be  $60\% * 65\% = 39\%$  of its nameplate capacity.**
- Such resource could have a floor on the Class Rating of, for example, 55%.
- **If fixed solar were later split into its own class, separate from higher-performing tracking solar, then the Performance Adjustment for such a unit would increase significantly (for example, to 105%) to represent its performance relative to other members of its new, fixed-only class.**
- **In this case, multiplying a 55% floor rating by a 105% Performance Adjustment would yield an Accredited UCAP value of 57.75% of nameplate, which is inappropriately high.** It would not be logical to apply a 55% floor value using a 105% Performance Adjustment.
- **Solution:** adjust the floor by a ratio of the aggregate performance of the new class relative to the old class.

*“Is it possible for ELCC Class Rating floors to bind to such an extent that PJM would be unable to identify sufficient offsetting reductions in ELCC Class Ratings across the ELCC portfolio to preserve the ELCC Portfolio UCAP? If so, how would PJM ensure that ELCC Resources are not assigned an aggregate UCAP greater than the ELCC Portfolio UCAP?”*

ANSWER = modify the floors.



# Amended RAA Language to Address Question 1

**Schedule 9.1(C)** The ELCC Portfolio UCAP shall be allocated, as specified in the PJM Manuals, to each ELCC Class UCAP, according to:

(a) the reliability value of the subject ELCC Class evaluated in the absence of other ELCC Classes, minus

(b) a quantity that is proportional to the product of:

- 1) the difference between the reliability value of the subject ELCC Class when evaluated in the presence of the entire portfolio of ELCC Classes and the reliability value of the subject ELCC Class when evaluated in the absence of the other ELCC Classes, and
- 2) the difference between the total reliability value of all the ELCC Classes in the model when evaluated jointly and the sum of the reliability values determined individually for each ELCC Class by evaluating the subject ELCC Class in the absence of other ELCC Classes.

~~The foregoing is in accordance with the applicable effective load carrying capability analysis methodology specified in the PJM Manuals, as~~ subject to adjustment in accordance with RAA, Schedule 9.1, section J, such that the aggregate of all ELCC Class UCAP values is equal to the ELCC Portfolio UCAP.

(f) While recognizing the general principle that the floor values already issued for a specific resource generally would not be changed, the limited circumstances under which the posted final floor values could be changed include: (i) the Office of the Interconnection no longer performs the effective load carrying capability analysis set forth in this RAA, Schedule 9.1; ~~or~~ (ii) the Office of the Interconnection no longer determines Accredited UCAP prior to conducting an RPM Auction; (iii) the Office of the Interconnection redefines an ELCC Class, in which case the floors for a given resource whose class has been redefined will be adjusted based on a ratio of the aggregate performance of the newly defined class of which it is a member relative to the aggregate performance of the previously-defined class of which it had been a member; or (iv) the aggregate Accredited UCAP values of all modeled ELCC Resources calculated using the applicable floor values are higher than the ELCC Portfolio UCAP, in which case the applicable floor values will be reduced by the same proportion such that the aggregate Accredited UCAP values of all modeled ELCC Resources equal the ELCC Portfolio UCAP.

# APPENDIX: RESPONSE TO OTHER QUESTIONS

- *4b. “Please explain whether the instant filing will affect the quantity of CIRs that ELCC Resources secure upon interconnection.”*
  - The ELCC filing redefines ICAP for storage and combination resources.
- *4c. “If the application of the ELCC analysis proposed in the instant filing results in an Accredited UCAP greater than a resource’s existing CIRs, please explain whether the resource will be able to secure additional CIRs sufficiently in advance to offer its full Accredited UCAP into the capacity market.”*
  - In some cases, yes.

*Q7a: “Under PJM’s proposal, would a Combination Resource offer into the capacity market as a single resource or two separate resources? Please provide any relevant tariff or manual citations.”*

**Approach:** Combination Resources (e.g., hybrids) participate in the Capacity Market as a single resource.

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