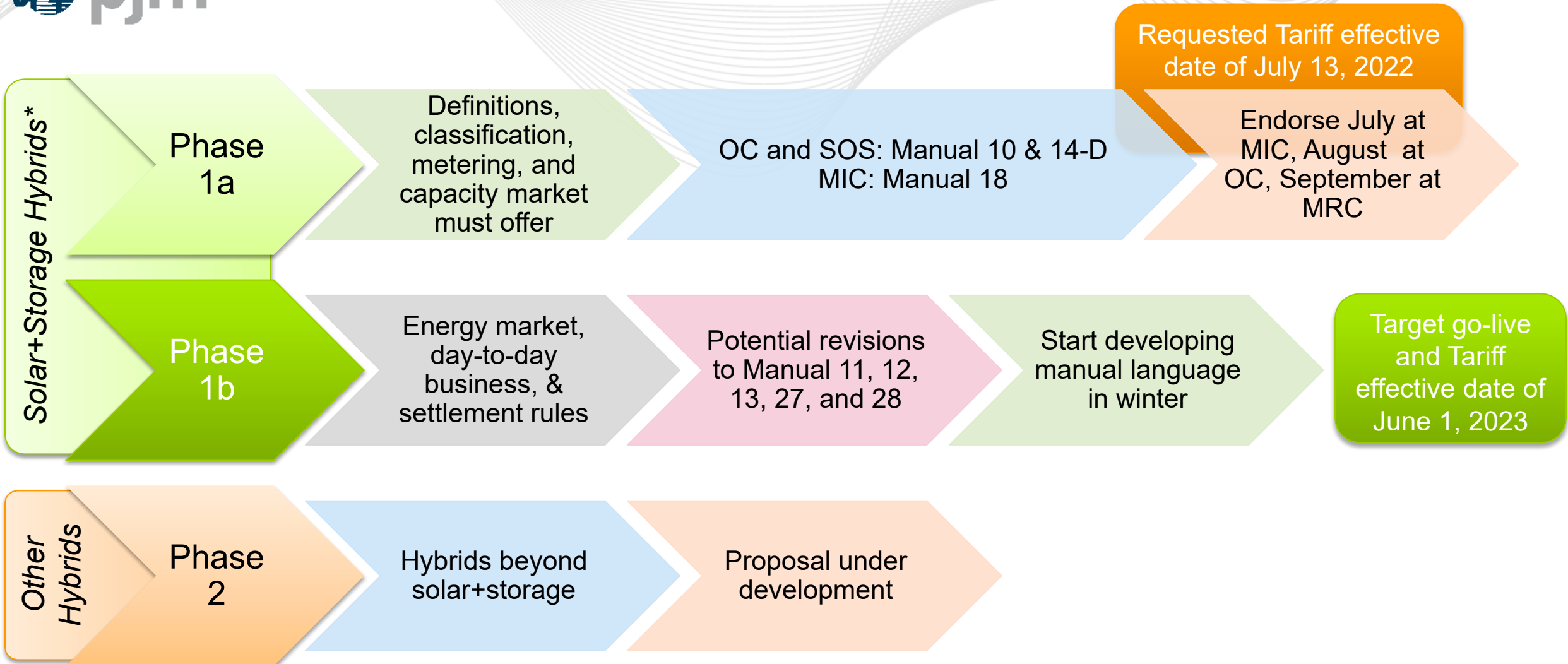
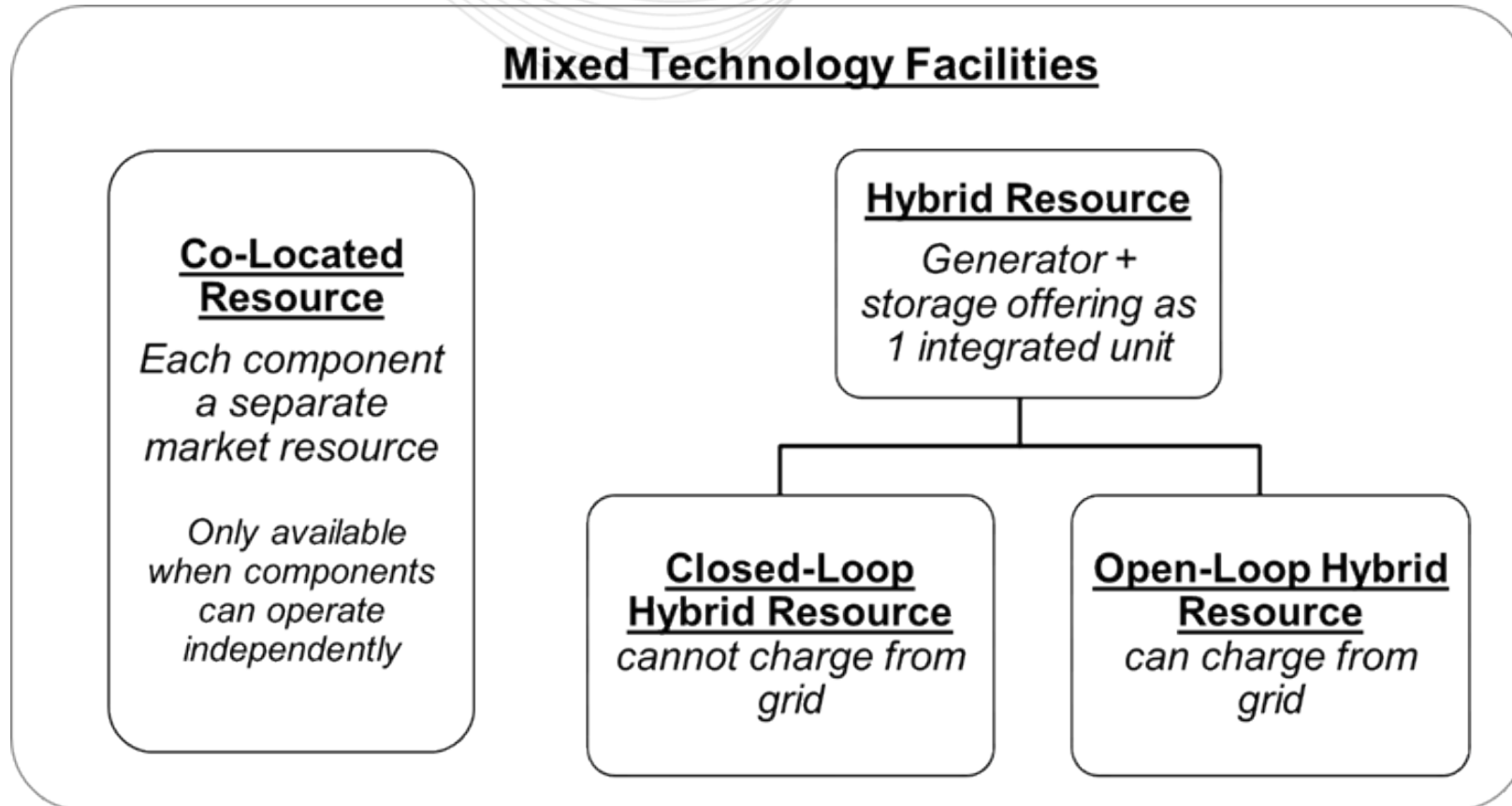


Hybrids and Mixed Technology Facilities: Phase 1a Manual Language Changes for the MIC (Manual 18)

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Market Design and Economics
PJM Market Implementation Committee
June 8, 2022



*Proposal endorsed by MC on Jan. 26, 2022. Initial filing March 22 in Docket ER22-1420. Re-filed w/ errata May 13 in same docket.
<https://www.pjm.com/directory/etariff/FercDockets/6590/20220322-ER22-1420-000.pdf>



- Add Hybrid Resources to the exemption from the Capacity Market must offer rule currently applied to Intermittent Resources and Capacity Storage Resources.
- E.g., Manual 18 Section 5.4 “Sell Offers in PJM”
 - “Intermittent Resources, Capacity Storage Resources, Hybrid Resources consisting exclusively of components that in isolation would be Intermittent Resources or Capacity Storage Resources, Demand Resources, and Energy Efficiency Resources are not required to submit a Capacity Performance sell offer segment.”
- This provision is currently in Manual 18 sections 4.7.1, 5.4.1, 5.7.1, and 5.8.1

Section 4.7.1 “Resource Position for Generation Capacity Resources”

- “For an RPM Auction, a party’s Daily Unoffered ICAP for a generation resource is equal to the party’s Minimum Available ICAP Position minus the Offered ICAP in the party’s sell offer. Effective with the 2020/2021 Delivery Year, the Daily Unoffered ICAP for Capacity Storage Resources, Intermittent Resources, Hybrid Resources consisting exclusively of components that in isolation would be Intermittent Resources or Capacity Storage Resources, and Environmentally-Limited Resources is not applicable since these resources are not subject to a Capacity Performance must offer requirement.”

Section 5.4.1 “Sell Offers in RPM”

- “With the exception of Intermittent Resources, Capacity Storage Resources, and Hybrid Resources consisting exclusively of components that in isolation would be Intermittent Resources or Capacity Storage Resources, each Generation Capacity Resource with available capacity that is capable or can reasonably become capable of qualifying as a Capacity Performance Resource must submit a Capacity Performance sell offer segment.”
- “Intermittent Resources, Capacity Storage Resources, Hybrid Resources consisting exclusively of components that in isolation would be Intermittent Resources or Capacity Storage Resources, Demand Resources, and Energy Efficiency Resources are not required to submit a Capacity Performance sell offer segment.”

Section 5.7.1 “Participation in the Base Residual Auction”

- “Following a Base Residual Auction, a party’s Daily Unoffered ICAP for a generation resource is calculated and is equal to the Available ICAP Position minus the Offered ICAP in the party’s sell offer. Effective with the 2020/2021 Delivery Year, the Daily Unoffered ICAP for Capacity Storage Resources, Intermittent Resources, Hybrid Resources consisting exclusively of components that in isolation would be Intermittent Resources or Capacity Storage Resources, and Environmentally-Limited Resources is not applicable since these resources are not subject to a Capacity Performance must offer requirement.”

Section 5.8.1 “Participation in the Incremental Auctions”

- A party’s Minimum Available ICAP Position represents the minimum amount that must be offered into an RPM Auction. A party’s Minimum Available ICAP Position on a unit for an RPM Auction is equal to the minimum Daily Minimum Available ICAP for such unit during the Delivery Year. Effective 2020/201 Delivery Year, a party’s Minimum Available ICAP for the summer/winter season will also be calculated in the Capacity Exchange system; however, Capacity Storage Resources, Intermittent Resources, Hybrid Resources consisting exclusively of components that in isolation would be Intermittent Resources or Capacity Storage Resources, and Environmentally Limited Resources are exempt from the Capacity Performance must offer requirement.”
- A party’s Daily Unoffered ICAP for a specific unit is calculated by adding the sum of any Daily Unoffered ICAP for such unit in prior RPM Auctions to Daily Unoffered ICAP amounts transacted through a party’s approved unit-specific bilateral sales/purchases. Effective with the 2020/2021 Delivery Year, the Daily Unoffered ICAP for Capacity Storage Resources, Intermittent Resources, Hybrid Resources consisting exclusively of components that in isolation would be Intermittent Resources or Capacity Storage Resources, and Environmentally-Limited Resources is not applicable since these resources are not subject to a Capacity Performance must offer requirement.

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APPENDIX: OC REVISIONS FOR INFORMATION PURPOSES

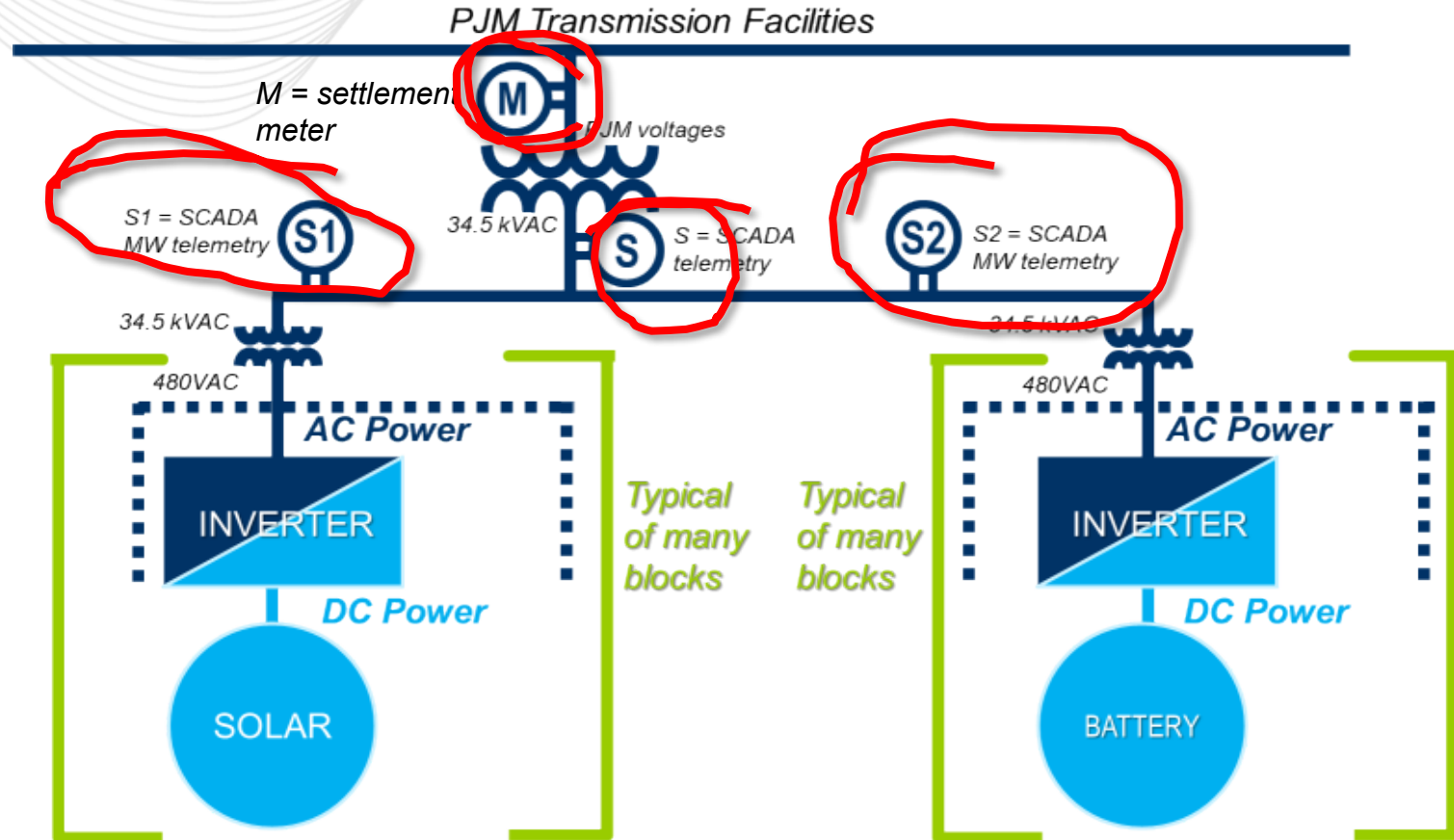
- No changes needed
- Manual 14-D will cite to existing accuracy requirements specified in Manual 01

Any time a generation resource has a limitation preventing the unit from achieving eDART Reportable MW, an eDART ticket is required. The eDART Reportable MW is the MW value that is the basis for outage reporting in eDART. It varies by resource type and is not to be confused with RPM committed MW value. The eDART Reportable MW is defined as follows:

Resource Type	eDART Reportable MW
For Capacity Resources	Total RPM (Owned) iCAP (Committed + Available) MW
For Energy Resources, Energy Storage Resources, wind and solar units	Based on nameplate rating
For units that are dynamically transferred into PJM, including pseudo-tied, dynamically scheduled, and block scheduled units	Capacity commitment
For those units inside PJM and dynamically transferred out of PJM	Based on full nameplate rating
For units that are partially behind the meter (load offset)	Based on nameplate rating minus the maximum load the unit expects to serve (year round)
For the solar component of solar-storage hybrid resources	Based on nameplate rating of the solar component
For the storage component of solar-storage hybrid resources	Based on nameplate rating of the storage component

Summary of Manual 14-D Changes

- State of Charge telemetry requirement for Hybrid Resources
- Metering/telemetry for Mixed Technology Facilities, including component-level MW submetering telemetry
- Separate eDart reporting by component for Hybrid Resources
- Reactive capability and testing
- Classification of Mixed Technology Facilities
- Single MOC for all Co-Located Resources at a Mixed Tech Facility.



Manual 14-D Summary (2)

- Section 4.1.7 – SCADA
- Section 4.2.3 Metering for Individual Generators
- Section 7.1.2 Voltage and Reactive Control
- Section 7.3 eDART reporting
- Section 8.3.3 –LOC rule clarification
- Section 12.2.4 –outage reporting clarification
- A new Section 13 for Mixed Tech Facilities
- Attachment D – Reactive Capability
- Attachment E – Reactive Tests
- Attachment L – Single MOC

Real Time Instantaneous Data Sent To PJM	
Frequency	1/1000th of HZ (i.e. 60.001 Hz)
Voltage	1/10th of kV (i.e. 69.1 kV)
Real Power MW	1 MW integer (i.e. 52 MW) required, but PJM will accept greater precision if available
Reactive Power MVAR	1 MVAR integer (i.e. 42 MVAR) required, but PJM will accept greater precision if available
Current State of Charge (Energy Storage Resource Model Participants <u>and Hybrid Resources</u> Only)	<u>1</u> MWh remaining
<u>Mixed Technology Facilities Only—Real Power MW from Each Component Technology (e.g., Solar MW and Battery MW)</u>	<u>1</u> MW

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