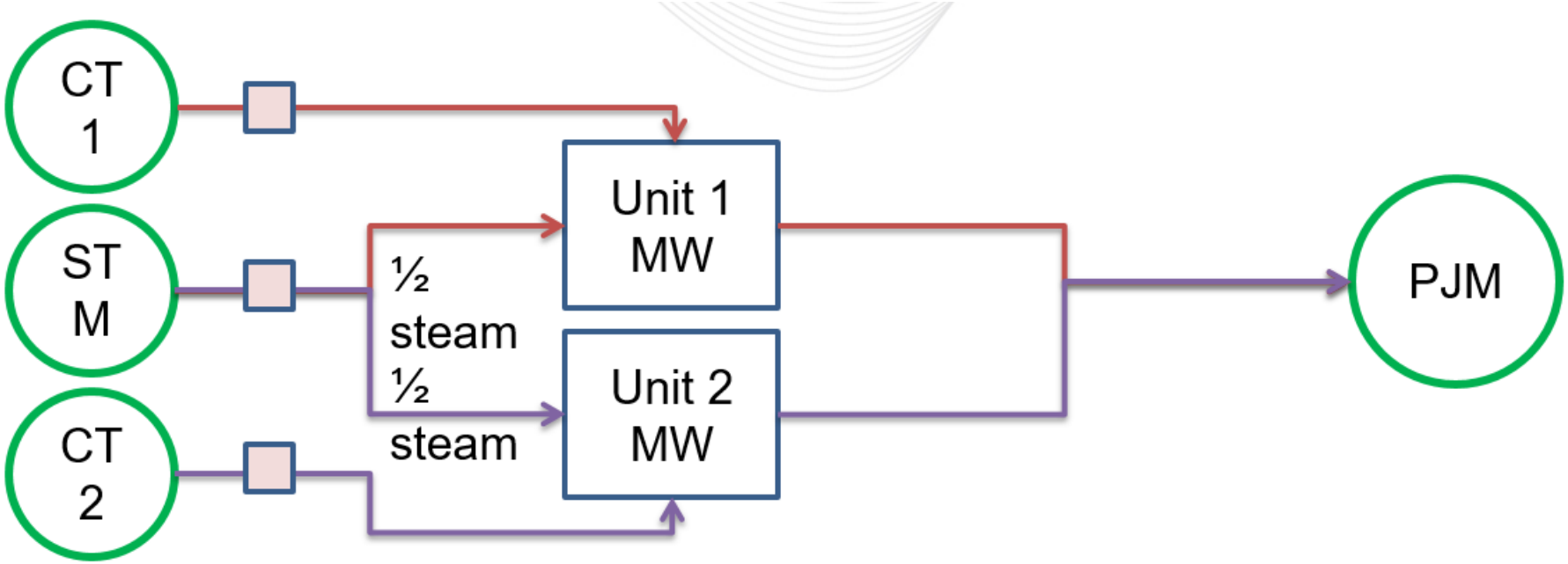
Combined Cycle Unit Pseudo Model Education

Tom Hauske
Performance Compliance
Market Implementation Committee
July 14, 2021

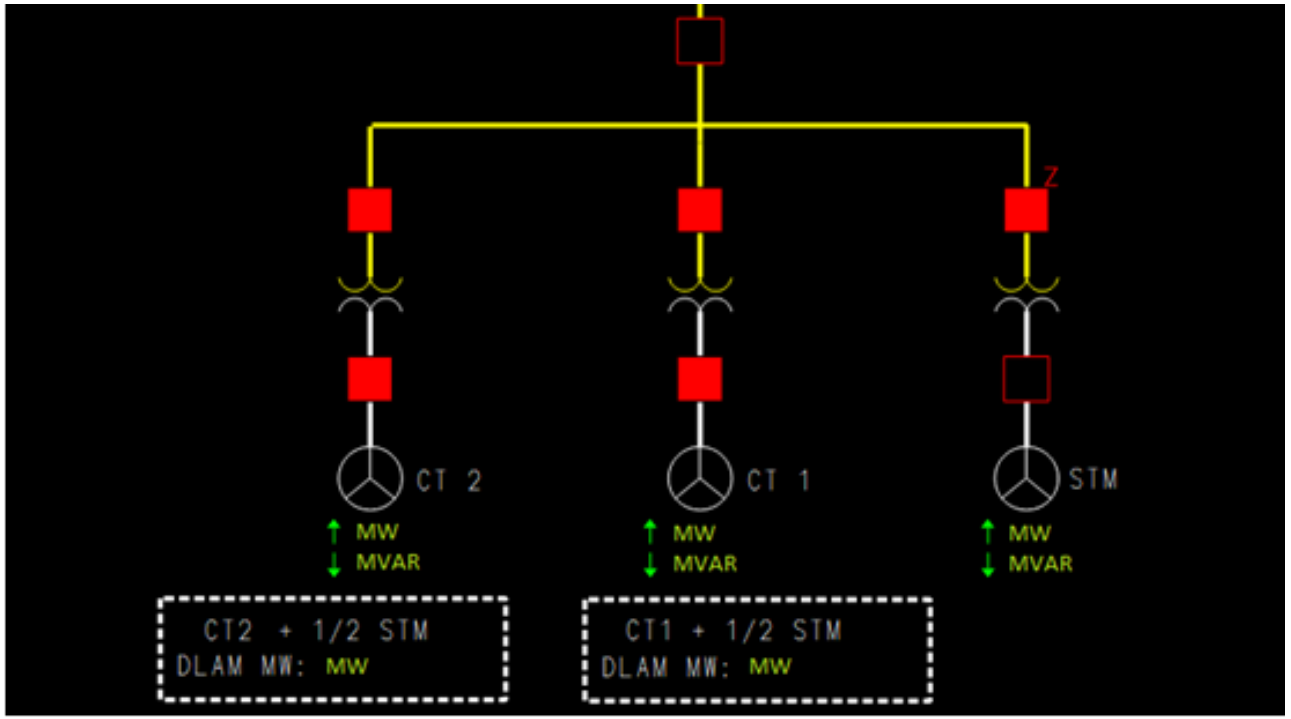
What is a Pseudo Model?

- Market Sellers can model a combined cycle unit as multiple pseudo units composed of a single Combustion Turbine (CT) and a portion of the Steam Turbine (ST)



Pseudo Unit EMS Modeling

- Below is an example of the EMS modeling for a 2x1 CC split into two 1x1/2 units



- A pseudo unit enters the same generating unit information as a non-pseudo modeled generating unit into Markets Gateway
  - Schedules
    - Cost, Price, Price-based PLS
  - Energy offer into the Day Ahead & Real Time
    - Start-Up, No-Load, and Incremental Energy
  - Operating Parameters
    - Ramp rates, Eco Min, Eco Max, Start-up times, etc.
  - Ancillary Service Offers
    - Synchronized Reserve & Regulation

Fuel Cost Policy

- Typically using a pseudo model should have no or minimal impact on a unit's existing Fuel Cost Policy
- However,
  - A new numerical example may be required
  - MIRA Cost Offer Assumptions data like heat rate coefficients and start-up cost may need to be updated

Operating Parameters

- Existing Combined Cycle technology proxy parameter limits apply to each pseudo unit (Link to: Capacity Performance Parameter Limitations)
- Upon remodel, existing unit specific parameter adjustment will be reset back to proxy values for a combined cycle technology.
- Market Sellers can submit a temporary exception request upon the remodel and a permanent unit specific parameter adjustment request by February 28 for a June 1 effective date by emailing unitspecificpls@pjm.com

Dispatch

- Pseudo modeled combined cycle units are dispatched as separate units and will receive separate AGC basepoints.
- Units should be offered with similar bids and operating parameters to avoid unbalanced operation.
  - Failure to do so could result in one pseudo model being dispatched into a peak mode like duct firing while the other is not.
- Failure to follow PJM dispatch can result in deviations or the unit being logged on for company.

Regulation

- Market Sellers need to qualify each pseudo unit in accordance with M12 Section 4.5
- Market Sellers should submit identical MW offers for pseudo units to minimize unbalanced regulation market awards
- Separate performance scores will be calculated for each pseudo unit.
  - PJM recommends pseudo units use the performance group option in M12 Section 4.5.7 to help align performance scores
- It is still possible to receive unbalanced regulation awards between pseudo units
  - PJM recommends contacting Dispatch to decommit or lower the unit's award for the hour.

- Revenue quality metering is required for all components of the combine cycle unit
- Unit owners must submit MWs for each pseudo modeled unit which includes its respective portion of the steam turbine MWs into Power Meter
- For pseudo modeled combined cycles units, PJM Settlements will only use the CT bus pnodes for settlement calculations. The ST(steam) pnode become irrelevant to settlement.

- Pseudo modeled combined cycle units should have all the component pieces (CTs and STs) modeled in eDART in accordance with the requirements of Manual 14D.
- Outages should be reported for each separate component.
- If a combustion turbine in a 2x1 pseudo modeled combine cycle is unavailable, the corresponding outage should also be entered for the steam turbine.

Combined Cycle Pseudo Modeling

- PJM has created a Combined Cycle Unit Pseudo Model Guidelines document which is posted with the meeting materials and will also be posted on PJM.com

- Market Sellers that want to request a pseudo unit remodel should email Client Management.

Contact

Facilitator:
Lisa Morelli,
Lisa.Morelli@pjm.com

Secretary:
Nick DiSciullo,
Nicholas.DiSciullo@pjm.com

Presenter/SME:
Thomas Hauske,
Thomas.Hauske@pjm.com

Combined Cycle Pseudo Model

Member Hotline

(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com