Scheduling & Dispatch

Treatment of Non-Priority Dispatch Renewables (NPDRs)

24th January 2024

This presentation provides background, content, and an explanation for the proposed changes to the Trading & Settlement Code for the Scheduling & Dispatch Programme initiative SDP_001: Treatment of Non-Priority Dispatch Renewable (NPDR) Units.

Achievable – Valuable – "Simple"

Design Minimum Operating Level (DMOL) Query

- **DMOL** refers to the the minimum output of a Controllable PPM where all generation units are generating electricity and capable of ramping upwards at any of the specified ramp rates.

- **Minimum Generation/Minimum Stable Generation** refers to the minimum output which a generating unit can generate continuously.

- It was suggested that DMOL is analogous to the concept of Minimum Stable Generation for thermal units and could be used similarly in scheduling and dispatch.

- However this would necessitate committing and de-committing these units (i.e. opening their circuit breaker) in cases where it is deemed necessary to dispatch them below DMOL.

- This would also limit the ability of NPDR units to participate fully and competitively in the balancing market, e.g. to price themselves to be dispatched to zero when the imbalance price is negative.

- We would expect that NPDRs may not be dispatched below DMOL often for energy balancing reasons (depending on prices submitted). In cases where all energy balancing options are exhausted and the next step is curtailment of Priority Dispatch renewables, thermal units will also be dispatched off (i.e. below Min Stable Generation) unless required for non-energy reasons.

Regulatory Context

- The SEM Committee published a proposed decision on the treatment of new renewables, SEM-21-027, based on parts of Articles 12 and 13 of Regulation (EU) 2019/943.

- As part of SEM-21-027 the SEMC requested that the TSOs/SEMO propose updated text to SEM-13-011 (Definition of Curtailment and Constraint) to account for:
  - The treatment of non-priority dispatch renewables, which will be subject to energy balancing, constraint and curtailment actions
  - Updates required to these definitions as a result of changes to the market since their publication in 2013

- Participants have also requested updates to the logic around the allocation of constraints and curtailment to better reflect each unit's ability to contribute and ensure more equitable outcomes.

Energy Balancing of NPDRs

- All NPDR units will be subject to an active Merit Order (energy balancing) Setpoint. This will be a reference point for the application of any constraints or curtailment.

- As a consequence, NPDR units will generally always have Active Power Control (APC) enabled. Note that APC is linked to tighter frequency regulation.

- NPDR units may receive setpoints which are higher than their realtime availability (if in merit) to account for future changes to output. For settlement purposes, a deemed Dispatch Instruction will be generated with a value of the lower of the setpoint and availability to avoid undue uninstructed imbalance charges.

- Existing logic for applying, relaxing and removing constraint and curtailment requires updates to account for energy balancing actions on non-priority renewable units (NPDRs).
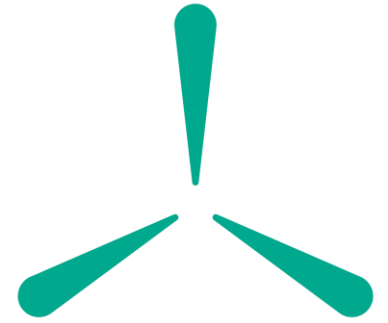
Constraint and Curtailment Updates - Rebalancing

- Participants raised concerns about the allocation of constraint and curtailment and the ability to take into account changing weather conditions.

- A new function - rebalancing - will reallocate constraint or curtailment across units in a group according to their ability to contribute at that time, e.g. due to changing weather conditions.

- Rebalancing will result in zero net change to the group MW target but will cause some units to increase output and some units to decrease output.

- At a unit level, instructions will just present as new LOCLs and CURLs.

Constraint and Curtailment Updates

- Updated logic is also required to manage multiple overlapping constraint groups. Currently if a unit is contributing to two or more security violations, constraints are applied cumulatively.

- Target model is for constraints to be applied in parallel, i.e. recognition that reducing output for security violation #1 helps alleviate issues associated with security violation #2.

- Calculation logic will be based on nominal output. Nominal output it the actual output that would be expected at nominal frequency (50Hz). It can differ from actual telemetered output due to frequency regulation. It is equivalent to the minimum of set points issued and availability.
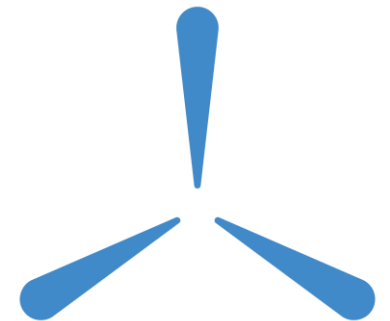
Applying Constraint/Curtailment

- Unit Setpoint = Group Target x (Unit Reference Quantity /Sum of Reference Quantities)

- For curtailment:
  - Unit reference quantity = Minimum of availability, merit order set point, constraint set point

    (i.e. nominal output)

- For constraints:
  - Unit reference quantity = Minimum of availability, merit order set point, curtailment set point, constraint set point from this constraint group

    OR
  - Unit reference quantity = Minimum of availability, merit order set point, curtailment set point, constraint set point from any constraint group

    (i.e. nominal output)

- Constraint set points may not be issued to the unit if it is already bound by a lower set point from another constraint group.
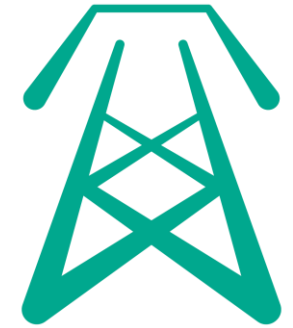
Rebalancing (new)

- Rebalancing is applied to a single group. Units bound by an action of a different type or from a different group may be excluded from the calculation.

- The group MW target remains unchanged for rebalancing. Rebalancing will result in zero net change but will cause some units to increase output and some units to decrease output.

- Control centre engineers can set limits on allowable MW delta for system security reasons. If necessary, set points will be scaled accordingly.

Rebalancing (new)

- Unit Setpoint = Group Target x (Unit Reference Quantity
  /Sum of Reference Quantities)
  x Limit Factor

- For curtailment:
  - Unit reference quantity = Minimum of availability, merit order set point, constraint set point

- For constraints:
  - Unit reference quantity = Minimum of availability, merit order set point, curtailment set point

- Constraint set points may not be issued to the unit if it is already bound by a lower set point from another constraint group.
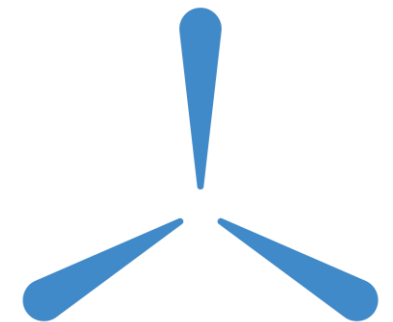
Relax

- Unit Setpoint = Unit Current Position + [(Group Target - Group Current Position) x (Unit Reference Quantity/ Sum of Reference Quantities)]

- For curtailment:
    - Unit reference quantity = headroom between nominal output and minimum of availability/merit order/constraint

- For constraints:
    - Unit reference quantity = headroom between nominal output and minimum of availability/merit order

    OR

    - Unit reference quantity = headroom between nominal output (excluding other constraint groups) and minimum of availability/merit order

- Constraint set points may not be issued to the unit if it is already bound by a lower set point from another constraint group.

Remove

- For curtailment:
  - Unit set point = Minimum of availability, merit order set point, constraint set point

- For constraints:
  - Unit set point = Minimum of availability, merit order set point

  OR

  - Unit set point = Minimum of availability, merit order set point, set points from other constraint groups
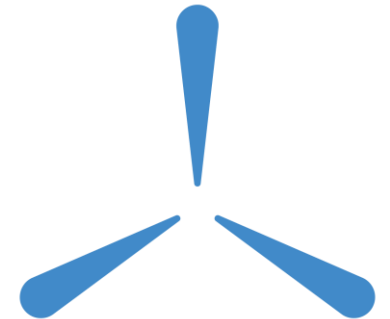
Next Steps

- Proposed NPDR mod to be submitted for vote at the Mods Committee on February 8th.

- Consultation on updates to SEM-13-011 text upcoming.

- Contact us at SchedulingandDispatch@EirGrid.com with any requests in relation to these or any other aspect of the Scheduling and Dispatch Programme.