

Granularity FPD-2

Granularity is the degree of detail for describing injections into and withdrawals from the RTO West grid. Granularity can be viewed as a hierarchy of aggregation:

- generation units or specific loads at a bus
- a single bus
- a closely tied group of buses
- all buses within a Congestion Zone
- perhaps larger groupings

The Flowpath impacts of injections and withdrawals depends on their location on the grid. Providing finer granularity allows greater precision in the analysis. Different levels of detail are needed for various purposes. To ensure system security and reliable operations, the RTO will need to know unit status (on/off) and MW output or consumption for generation and dispatchable loads over a certain size. These requirements will be specified in the tariff (in DSTAR it is described in Scheduling Appendix, Section B.1.8)

Our focus here is on granularity for the commercial congestion management model. At least four applications must be considered:

1. translating preexisting contracts and load service obligations into Flowpath rights (including changes over time)
2. submitting schedules with appropriate Transmission Rights (TRs)
3. schedule adjustments/curtailments
4. settlement

It is difficult for Scheduling Coordinators (SCs) who are managing commercial transactions to provide the level of detail that planners and operators desire. This is particularly true for short-term load forecasting, which is done on an aggregate basis. In addition, the market desires transmission rights that are simple to understand, tradable and as flexible as possible. This argues for greater aggregation.

Generators represent a small set of buses with large impacts on the grid. Their dispersion within a zone could have a significantly different impacts on Flowpaths. On the other hand, SCs would like the flexibility to select between generating units within a geographic area without having to worry about whether they have precisely the correct bouquet of rights.

In contrast, loads are often well dispersed within a zone. They are typically forecasted on an aggregated basis and prorated to buses based on historical patterns. Small changes in patterns should not materially impact Flowpath usage.

Inter-SC trades are energy exchanges between SCs. The same considerations should apply as for generation and loads of a single SC.

Scheduling Points are locations where the RTO West grid is interconnected with neighboring RTOs or other control areas within the RTO West service territory. Like generation, there are relatively few Scheduling Points and their locations are precisely known.

A fundamental premise in the chosen model is that schedules between generation and loads within a Congestion Zone (also including inter-SC trades and Scheduling Points) do not need TRs. This requires that all buses within a Congestion Zone have the same Flow Distribution Factors (FDFs). The tradeoff is that aggregating injections and withdrawals at a zone level will lead to a mismatch between the commercial and operating model. A multi-zone schedule specified at an aggregate level that appears to fit within a bundle of rights may actually exceed those rights, requiring RTO actions and costs to mitigate. Significant differences lead to large amounts of uplift. It may also provide gaming opportunities to create congestion.

One key way to minimize the mismatches is to choose the appropriate number of zones. Coherency analysis will provide guidance. Weighted FDFs may also help. Analysis is needed to determine whether generation, load or other weighting provides better results.

Recommendation:

- 1. Balanced schedules shall be submitted at the level of detail specified in the RTO West Scheduling Appendix.**
- 2. For all four applications of the commercial model listed above, injections and withdrawals shall be evaluated at the Congestion Zone level.**

Note: When the RTO runs an Optimal Power Flow to evaluate inc/dec bids for congestion redispatch, it should use the particular bus location for each bidder to be certain that the desired results are achieved. The same should apply to curtailments.