Issue CM-08
Phased Implementation of Flow Distributed Scheduling

Background

The Congestion Management Work Group considered a proposal to use Rated Path Scheduling (RPS) on an interim basis, to begin operation of RTO West. This is consistent with FERC's intent to allow time for an orderly transition to market based congestion management. The proposal is intended to avoid unnecessary risks, simplify and expedite the formation of RTO West, and allow the RTO board to implement an orderly transition to Flow Distributed Scheduling (FDS). It captures the lion's share of the original congestion management model's benefits because it immediately implements nearly that entire model. The proposal is not to abandon FDS, but merely to use RPS initially, while working toward implementation of FDS.

The following elements of the current RTO West proposal are unchanged:

- Maintain the provision that FTRs/RTRs/NTRs are physical rights and are needed to schedule across congested paths.
- Use the full list of desired flowpaths rather than consolidating zones or internalizing congested paths for simplicity.
- Define the flowgates and congestion zones necessary to implement FDS at the end of the interim period.
- Convert existing contracts to transfer payments and FTRs as proposed except that the converted FTRs lie along the original contract path.
- Treat preexisting contract rights and LSOs as previously discussed.
- Develop the auction process for release of unencumbered FTRs.
- Maintain a commitment to a robust secondary market for FTRs.
- Implement the process for daily release of unscheduled FTRs to the RTR/NTR auction.
- Manage residual congestion as currently proposed with a redispatch funded through the uplift charge.
- Operate the real-time balancing and ancillary service markets as proposed.
- Continue to develop an appropriate loss methodology.

This proposal is to delay for one year (requiring action by the board to implement further delay) the following elements:

- Flow based scheduling; Rated Path Scheduling will continue to be used for mapping the daily schedules into the transmission paths.

- Reallocation of existing contract rights based FTRs to match new scheduling requirements of the Flow Distribution Factor matrices.

Appropriate milestones may need to be established to help assure final conversion to FDS happens in an orderly manner. At a minimum, all contract and LSO entitlements must be converted to FTRs along the contract paths by the start of RTO operation.

Alternatives Considered

The two alternatives proposed for the RRG are as follows

1. Design congestion management implementation to allow an interim period where rated path scheduling would be used prior to use of flow distributed scheduling. The period would be one year, or longer if the board decides to extend the period.

2. Design congestion management implementation to require flow distributed scheduling and flow distributed contract conversion immediately upon commencement of operations under the RTO. Recognize that an interim step of contract path scheduling could be used as a backstop in case the full flow distributed scheduling proposal cannot be implemented in time.

Flow Distributed Scheduling
A Proposal for Phased Implementation

FERC Order 2000 Requirements

In Order 2000, FERC requires the RTO to have a market mechanism to manage congestion in place one year after start-up.

Proposal to Initially Use Rated Path Scheduling

This proposal is to use Rated Path Scheduling (RPS) on an interim basis, to begin operation of RTO West. This is consistent with FERC's intent to allow time for an orderly transition to market based congestion management. The proposal will avoid unnecessary risks, simplify and expedite the formation of RTO West, and allow the RTO board to implement an orderly transition to Flow Distributed Scheduling (FDS). It captures the lion's share of the proposed congestion management model's benefits because it implements much of that model. It also allows us to temporarily circumvent some of the most troublesome issues of FDS.

The proposal is not to abandon FDS, but merely to use RPS initially, while working toward implementation of FDS. Rich Bayless' suggestion to continue the design of the FDS model, but to initially put ones and zeroes in the Scheduling Flow Distribution Matrices is a workable way to implement the proposal.

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- Convert existing contracts to transfer payments and FTRs as proposed except that the converted FTRs lie along the original contract path.
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- Manage residual congestion as currently proposed with a redispatch funded through the uplift charge.

- Operate the real-time balancing and ancillary service markets as proposed.

- Continue to develop an appropriate loss methodology.

This proposal is to delay for one year (requiring action by the board to implement further delay) the following elements:

- Flow based scheduling; Rated Path Scheduling will continue to be used for mapping the daily schedules into the transmission paths.

- Reallocation of existing contract rights based FTRs to match new scheduling requirements of the Flow Distribution Factor matrices.

Appropriate milestones may need to be established to help assure final conversion to FDS happens in an orderly manner. At a minimum, all contract and LSO entitlements must be converted to FTRs along the contract paths by the start of RTO operation.

This proposal would ***not*** increase the quantity of FTRs set aside for PECs or LSOs. There should be no decrease in the number of unencumbered FTRs that would be available in the market. The only thing it changes is the path over which the initial FTRs are allocated and how the daily schedules are implemented. To initiate the proposal will require identifying the PEC and LSO encumbrances and allocate a matching set of FTRs simply along the existing contract paths. To enable Flow Distributed Scheduling would require the same total quantity of FTRs, but they must be allocated over many parallel paths.

Benefits

Achieves most of the efficiency benefit of the FDS model.

Rated Path Scheduling is in fact a form of market management of congestion with its only shortcoming being some residual congestion due to “loop flow” effects.

One objective of RTO development is improving system throughput. The present day application of a dual constraint (schedule and actual) degrades throughput. Today we stop scheduling when a schedule reaches the path capacity, even though actual flow may be much lower. This happens even when no parallel paths are fully loaded with either scheduled or actual transfers. This interim RPS proposal does capture the “throughput” efficiencies we have been striving to achieve. The elimination of embedded cost rate pancaking, and creation of the FTR auction and a robust secondary market, will achieve

essentially the same throughput improvement as the initial FDS approach. If any path is fully scheduled, but the actual flow is low and parallel paths are not fully loaded, then some parallel path must have schedule room and the FTR/RTR can be acquired and additional schedules implemented.

Another goal of RTO design is the development of efficient and accurate price signals for congestion management. It is important to ensure market participants face the congestion clearing costs associated with their scheduling decisions. To the extent there is a mismatch between scheduled transactions and the actual flows they produce, there will be residual congestion that would be managed through redispatch and funded through uplift. The coordinated use of phase shifters and the fact that all scheduling must be limited to actual path capacities will limit the magnitude of this residual congestion. This magnitude will be no larger than the loop flow costs that are being internalized today and will be shared in a more equitable manner.

Allows FTR secondary markets to develop.

One of the most critical features of the current RTO West proposal is the existence of functional, liquid secondary markets for FTRs. The FDS approach will not work without the ability to easily obtain FTRs on numerous parallel paths at prices reflecting congestion costs. Because of the numerous paths involved, the FDS approach is much more sensitive to this need than an RPS approach would be. The RPS proposal allows time for the FTR secondary markets to develop without disrupting current ability to do business.

Avoids loss of throughput due to schedule blockage on minor paths.

One of the most troublesome aspects of the RTO West proposal has always been the problem that a 100 MW schedule can be completely stopped because 5 MW of it got flow distributed onto a path where FTRs are unavailable due to lack of a well developed, liquid market. This outcome will have a calamitous effect on throughput. The RPS approach is not subject to the problem and should be used until appropriate FTR markets develop.

Achieves significant and beneficial operational simplification.

Simplification is necessary. Jumping too quickly into a highly complex, unfamiliar and untested FDS scheme is inviting a severe negative impact on the commercial viability and reliability of the power markets. We cannot overlook the operational difficulty of spreading schedules among multiple parallel paths when this change is simultaneously overlaid on the multitude of other changes necessary to start an RTO.

Rich Bayless recognized this and proposed a simplification based on lumping together various congestion zones into what have been called amoebas. Unfortunately, this would eliminate all price signals on some paths with commercially significant congestion. Whatever congestion is inside of an amoeba would be “residual” and would fail to be

incorporated into any price signal given to the market. The RPS approach achieves a similar degree of simplification without ignoring any significant constraints.

Simplifies conversion of contracts and load entitlements to FTRs.

Because the scheduling paths of existing contracts and entitlements will not be changed, it should be significantly easier to convert existing rights to FTRs. The inherent difficulty of this conversion should not be underestimated. Many contracts have restrictions and entitlements that do not translate well to FTRs. It will not help to compound this difficulty by trying to also spread the rights to multiple new paths. Also, to stay within the existing paths reduces the number of parties that have to be involved in negotiations of each rights translation. Mostly, only the parties to the contract need to negotiate its conversion, rather than all of the parties to the parallel paths that it may fan out to.

Preserves FDS as an end state.

To implement RPS on an interim basis at RTO formation does not eliminate FDS as an end state. Instead, it provides a way to have an orderly and reliable transition. It will be a lot easier for utilities to accept FDS as an end state if it is clear that a transition path that avoids unreasonable risks has been put in place up front.

Allows time to measure performance and fine tune FDS implementation.

During the RPS interim period residual congestion can and will be measured. Also, an analysis of what would result from flow distributing the schedules can be performed. This allows time to measure the congestion and appropriateness of the proposed flowgates and to understand how, exactly, the conversion is to take place. Otherwise we will be converting to a new set of rights without having the assurance that our accustomed levels of system access and congestion protection will be achieved.

Disadvantages

Some level of increased residual congestion will likely result from the RPS proposal. The FDS approach should result in less residual congestion. This could be important if the reduction is significant. Quantification of the reduction would be attractive to help motivate utilities to change and to fine tune details such as the selection of flowgates. It should still be noted that the use of phase shifters and limiting schedules to capacities should reduce this disadvantage.

Residual congestion is that which cannot be tied to transactions that let the costs be assigned to the correct parties. While it was hoped that FDS would make it easy to discern who was creating congestion, it is likely that this goal will still be extremely difficult to attain. Many factors will contribute to residual congestion, in a real world FDS situation. If FTRs are issued up to the non-simultaneous rating of congested paths,

then during some operating conditions the interaction of paths will result in actual flow congestion if all the FTRs are scheduled simultaneously. The accumulated effect of flow distribution factors, which are deemed small enough to be insignificant, may at times create some level of residual congestion. Differences between the operational and the scheduling models, line outages, the switching of series compensation and loopflow from neighboring RTOs, all contribute to residual congestion. The impossible nature of tracking all scheduling effects into actual flows means some residual congestion will continue to exist and result in an uplift charge.