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Transmission Upgrades: Inclusion in Regional Transmission Plans and Cost allocation

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I. Regional Transmission Plans

A. What do they include?

B. How are they developed?

C. How are they implemented?

A.1 What Transmission Upgrades Are Included in a Regional Transmission Plan?

1. **Reliability Upgrades: Required** - to meet Reliability Criteria

Generation Induced Upgrades:

- When utilities designate new generation resources to serve load, they must request that this new source of generation be designated as a network resource. If so doing results in a violation of Reliability Criteria, the RTO will require that upgrades be made.
- When a new generation resource is interconnected to the transmission system the RTO determines whether or not transmission upgrades are required.

Load Induced Upgrades:

- Each year the RTO analyzes changes in load forecasts to determine if there are violations to Reliability Criteria in the transmission system. If so, the RTO will require that upgrades be made.

A.2 What Transmission Upgrades Are Included in a Regional Transmission Plan?

2. **Economic Upgrades: Optional** – to provide Cost Savings

Congestion Reducing Upgrades:

- Upgrades to the transmission system not needed to reliably deliver power from available sources, but help to deliver power from least-variable-cost sources by reducing congestion on the transmission system. Reduced congestion also increases the level of wholesale competition for both off-system energy transactions as well as for longer term wholesale power contracts.

Capacity Reducing Upgrades:

- Upgrades that allow the utility to reduce the amount of generation capacity needed in its reserve requirements.

B.1 How Are Reliability Upgrades Developed?

Generation Induced Upgrades: All generation induced upgrades come from reliability studies performed by the RTO for either:

1. Requests for Generation Interconnection; or
2. Requests for new or changed DNR.

Load Induced Upgrades: All load induced upgrades come from reliability planning studies that are performed by the RTO on a scheduled (e.g., every year) basis.

In both cases, the RTO is looking for the least-cost solution for fixing the reliability problem.

B.2 How Are Economic Upgrades Developed?

Congestion Reducing Upgrades: RTOs generate variable production cost savings studies that are used to determine the benefits from projects. Projects evaluated are those expected to produce benefits in excess of their costs. Benefit measures include:

1. Adjusted Production Costs – for savings from off-system transactions.
2. Load LMP – for savings from increased competition from longer term wholesale power contracts.

Capacity Reducing Upgrades: Reserve sharing groups perform Loss of Load Expectation (LOLE) studies to determine reserve margins necessary to meet one day in 10 year reliability standard. With the help of the RTO, transmission upgrades that can reduce the reserve margin standard are developed.

C.1 How Are Reliability Upgrades Implemented?

Generation Induced Upgrades:

- Transmission Owners have the obligation to build.
- RTO tariffs determine the allocation of costs to Transmission Customers or Generators.

Load Induced Upgrades:

- Transmission Owners have the obligation to build.
- RTO tariffs determines the allocation of costs to Transmission Customers.

C.2 How Are Economic Upgrades Implemented?

Congestion Reducing Upgrades:

- Historically, Economic Upgrades are not built unless there are Project Sponsors willing to pay = Participant Funding
- **Change:** Moving to a system in which regional benefits of larger/higher voltage projects are being recognized, and projects that qualify must make best efforts to build.

Capacity Reducing Upgrades:

- Currently, implementation is up to those who benefit from the transmission upgrade = Participant Funding
- Beginning to see the regional benefit of some of these type projects, and could be implemented by RTOs in few years.

III. Issues To Consider

A. Mandatory vs. Voluntary

B. What Qualifies - Inclusion Criteria

C. How To Measure Benefits

D. Who Pays – Cost Allocation

A. Mandatory vs. Voluntary

Participant Funding of large, high voltage projects (backbone type) is extremely difficult to accomplish.

- Participants want the benefits, but want others to pay the costs.
- These type projects are likely to cover multi-states and this results in uncertainty with respect to being able to recover any commitment to pay for the upgrade.
- With Order 888, municipals are no longer native load customers of their utilities.
  - Must contract competitively for wholesale suppliers.
  - Existing transmission system is too congested to provide adequate levels of competition.
  - Results in pressure to build a more robust transmission system in order for wholesale customers to obtain lower cost generation alternatives.

B. What Projects Qualify?

Midwest ISO: Benefits must exceed costs by a ratio of 1.2 to 1 for projects that can be completed in one year or less, with 0.2 being added to the ratio or each additional year; e.g., a ratio of 2 to 1 for projects that take 5 years to complete and 3 to 1 for projects that take 10 years to complete.

- For a 5-year project B:C is 2:1 ⇒ 5 year payback

Southwest Power Pool: Currently under study by the Regional State Committee's Cost Allocation Working Group – made up of staff from each state.

C.1 How to measure benefits?

Adjusted Production Cost (APC) Savings measures the savings in production costs that regulated retail loads would likely receive when profits from off-system sales and savings from off-system purchases are passed on to customers.

Load LMP Savings measures the change in spot-market prices times the load, and reflects what competitive wholesale markets are likely to see in future mid and long term wholesale power contracts.

C.2 What is the "Best" measure of economic benefits?

There is no perfect measure.

- Assumptions about inputs to determine future production cost levels will be wrong.
- Assumptions about the location of new generation sources and demand response resources will be wrong.
- Assumptions about the future mix of regulated and competitive load will be wrong.

Balance is an imprecise concept.

- What is a reasonable weighting to place on benefit metrics; e.g., (70% APC + 30% Load LMP)
- Will likely depend on the RTO region.

D.1 Who pays?

- Beneficiaries Pay: Correct principle, but calculation of proper measure of benefits for Transmission Customers is challenging.
- Region-Wide Postage Stamp Rate: Works when the region in question is highly interconnected. For large RTO footprints, this is a problem.
- Combination: Allocate X% to beneficiaries and (1-X)% on a region-wide basis.

D.2 Midwest ISO Proposal

- Region wide Postage Stamp Rate = 20%
- Sub-region wide Postage Stamp Rate = 80%
- Another Alternative:
  - For first 5 years, 80% allocated to pricing zones benefiting from upgrade using the 70% APC + 30% Load LMP measure of benefits.
  - After 5 years move to Sub-region wide Postage Stamp Rate.

D3. Balancing Portfolio of Projects

Key political-economic goal:

- Goal is for the portfolio of projects to spread benefits throughout the region/sub-region that is paying for the upgrades.
- Extremely important when multiple states are involved.

Midwest ISO's Proposal:

- As a part of the planning process for Regionally Beneficial Projects, MISO shall seek to identify and manage the development of, portfolios of projects that tend to provide benefits throughout each sub region over the planning horizon of the MTEP.

Conclusion: Two Critical Issues

1. INCLUSION CRITERIA
   - Will determine the cut off between what gets built and what does not.
   - Will probably see this B:C relatively high to begin with, and decreasing with experience.
2. COST ALLOCATION
   - Determines who will pay the cost of economic upgrades.
   - Benefit metrics will expand over time with experience.
   - Key political-economic component is for the RTO region to balance the portfolio of projects.