



# Presentation to the Joint Boards on Economic Dispatch

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## ○ Overview

- Discussion of Security Constrained Economic Dispatch (SCED)
- Presentation of the benefits of SCED
- Responses to questions of the Commission

## ○ The Components of SCED

- Security constrained economic dispatch is the system operator's dispatch of generation resources to meet load in the most reliable and economic manner, taking into account the constraints of the system
  - SCED is not a new concept ...
    - Whenever the transmission system is constrained there is a need to ration capacity in a reliable manner
  - SCED is performed by the RTO and non-RTO utilities because it is the most reliable and economic way to manage the system

## ○ “Security Constrained” Dispatch

- The concept of a “security constrained” dispatch requires the system operator to account for:
  - System Balance and Frequency
  - Coordinated Power Flows Recognizing
    - Operational Security Limits
    - Possible Contingencies
    - Transmission Congestion

## ○ Economic Dispatch

- The concept of economic dispatch requires the system operator to select generation resources to dispatch in some economic “merit order” based primarily on the incremental costs of dispatching each unit at each level of output, taking into account the security of the system.
  - This is to suggest that economic dispatch and reliability cannot be separated.
  - An economic dispatch is an efficient dispatch.

## ○ Benefits of a Regional SCED

- SCED over a larger region, such as that provided by RTOs / ISOs, provides inherent benefits:
  - Internalization of Loop Flows across a wider region means more flows on the transmission system are managed by dispatch rather than by the less efficient TLR method.
  - Optimization of dispatch across a wider region leads to more economic use of resources.
  - Regional approach leads to more efficient planning and investment.

## ○ Benefits and Costs of SCED

- *What are the benefits and costs of SCED, compared to the previous system used for dispatch, or to other potential alternatives? What specific benefits has SCED offered? Can you quantify these benefits, and if so, please do so.*
  - Preliminary indications estimate roughly between \$600K and \$1million in maximum benefits from production costs savings over the 24-hour period on July 7, 2005.
  - Simulation of pre-regional SCED to post-regional SCED indicates at least a 2.5 to 1 benefit / cost ratio in production costs savings.
  - Prior system of reliance on TLRs was inefficient and led to a more than 12% under utilization of the capacity of constrained flowgates.

## ○ Lessons Learned

- *What lessons did you learn in implementing SCED? In particular, were there unanticipated benefits or costs that should be kept in mind when considering changes or improvements to the current SCED?*
  - Implementing a regional dispatch in place of a local dispatch may change preexisting dispatch patterns and preempt the operation of certain higher priced generation.
  - Implementation of a regional dispatch with transparent prices has led to reduced congestion in formerly highly congested areas.

## ○ SCED and Regional Markets

- *How does the operation of SCED relate to the operation of the regional market? How would a market operate in your region without SCED?*
  - The LMP based markets in the Midwest ISO are the result of, not the cause for, a regional SCED.
  - Transparency in the regional markets has led to a more economic dispatch.
  - Prior to a regional SCED, the region did not have the transparent prices that have led to the more economic dispatch.

## ○ SCED Enhances Reliability

- *What effect has SCED had on the reliability of the electric system in your region? Can you quantify the effect, and if so, please do so.*
  - The Midwest ISO SCED process is based on advanced state estimator modeling, contingency analysis and reliability monitoring.
  - Implementation of a regional SCED has led to a considerable decrease in the amount of megawatts curtailed via the TLR process.
  - Implementation of a regional SCED has brought with it more robust coordination agreements with neighboring entities.

## ○ SCED and the Cost of Energy

- *What effect has SCED had on the cost of electric energy in your region, after adjusting for input costs such as fuel? Can you quantify the effect, and if so, please do so.*
  - Midwest ISO studies identified projected SCED benefits for footprint and selected areas.
  - In the Grandfathered Agreements proceeding (FERC Dockets EL01-104-000 & ER01-691-000):
    - Savings in production and purchased power costs + increase in off-system sales revenue, net of market implementation costs = \$128 million / yr.
    - Savings in cost to serve load at market prices, net of market implementation costs = \$586 million / yr.

# ○ SCED and the Cost of Energy

## ■ Individual State and Utility Studies

- Wisconsin Midwest ISO utilities: Midwest ISO regional dispatch projected save, after congestion & market implementation costs = \$51.2 million / yr.
- LG&E / KU: Withdrawal from Midwest ISO projected to cost LG&E / KU \$46.2 million per year based on comprehensive analysis of all revenue and cost impacts including SCED benefits.
  - These recurring costs do not include the projected exit fee of \$40.2 million.
- Aquila's Missouri Operating Companies: Participation in Midwest ISO regional dispatch could reduce production and purchased power costs by \$6 million / yr. and lower congestion costs by an additional \$6 million / yr. compared to Stand Alone operations.
  - Also cost savings and reliability benefits from participation in Midwest ISO security-constrained economic dispatch when compared to proposed SPP Energy Imbalance Service.

## ○ Concluding Remarks

- Implementation of a regional SCED process in the Midwest ISO has resulted in improved reliability and substantial cost savings
- Continuously working to achieve the full benefits of SCED