UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Joint Boards on Security Constrained Economic Dispatch

Docket No. AD05-13-000

SUPPLEMENTAL NOTICE OF SECOND SOUTH JOINT BOARD MEETING

(February 10, 2006)

On January 6, 2006, the Commission announced that it planned to hold further joint board meetings and that these meetings would take place at the Hyatt Regency on Capitol Hill, 400 New Jersey Avenue, N.W., in Washington D.C. Take notice that the joint board meeting for the South region is scheduled to take place on Sunday, February 12, 2006, from 9:30 a.m. to 12:00 p.m. (EST) in the Yorktown Room.

These meetings are held pursuant to section 1298 of the Energy Policy Act of 2005, Pub. L. No. 109-58, § 1298, 119 Stat. 594, 986 (2005). Section 1298 adds section 223 to the Federal Power Act, 16 U.S.C. §§ 824 *et seq.* (2000), requiring the Commission to convene joint boards on a regional basis pursuant to FPA section 209 "to study the issue of security constrained economic dispatch for the various market regions," "to consider issues relevant to what constitutes 'security constrained economic dispatch' and how such a mode of operating . . . affects or enhances the reliability and affordability of service," and "to make recommendations to the Commission."

Take further notice that attached are: (1) an agenda for the meeting, (2) a draft study previously circulated to the board members, and (3) recommendations to be considered by the board.

Take further notice that the following changes have taken place to the South Joint Board membership: former Chairman Braulio Baez was replaced by Commissioner J. Terry Deason of the Florida Public Service Commission, and former Commissioner Michael Callahan was replaced by Dr. Christopher Garbacz, Director, Economics and Planning, Mississippi Public Service Commission. A complete and updated list of board members is available at www.ferc.gov.

For more information about the meeting, please contact Sarah McKinley at 202-502-8004 or sarah.mckinley@ferc.gov.

Magalie R. Salas
Secretary

Attachment A

AGENDA FOR THE SOUTH JOINT BOARD MEETING
February 12, 2006

- Opening remarks

- General comments on draft study previously circulated

- Recommendations proposed during the course of the Joint Board's activities
    - Recommendations for the Board's consideration are attached to this agenda

- Process for subsequent drafts

- Next steps and closing remarks

Attachment B: Draft Study

DRAFT

Study of Security Constrained Economic Dispatch
by
Joint Board on Economic Dispatch for the South Region

January --, 2006

Overview

The South Joint Board for the Study of Security Constrained Economic Dispatch is one of four joint boards designated by the Commission under EPAct2005, section 1298, Economic Dispatch.

As the Commission noted in the initial order convening the joint boards:

> Each joint board is authorized: (1)"to consider issues relevant to what constitutes 'security constrained economic dispatch'"; (2) to consider "how such a mode of operating an electric energy system affects or enhances the reliability and affordability of service to customers in the region concerned"; and (3) "to make recommendations to the Commission regarding such issues."

This report is divided into four sections. The first, Security Constrained Economic Dispatch: the Basics, provides a description of the basic concept of Security Constrained Economic Dispatch used in the study; the second, Economic Dispatch in the South, describes dispatch procedures in the South; the third summarizes the issues raised and considered by the board, including any recommendations made by individual board members or other parties to address these issues; and the fourth section discusses the recommendations of this Joint Board. The principal sources for these sections are presentations to the board and written comments submitted, discussions among the Joint Board members, the Department of Energy (DOE) report under EPAct 2005, section 1234, and the responses to the DOE survey of economic dispatch.

Security Constrained Economic Dispatch: the Basics

For purposes of the joint boards' studies, the FERC adopted the following definition of Security Constrained Economic Dispatch (SCED): "the operation of generation facilities to produce energy at the lowest cost to reliably serve consumers, recognizing any operational limits of generation and transmission facilities."[1] This definition describes the basic way all utilities in the region dispatch their own and purchased resources to meet electricity load. The basics of SCED are described in this section to establish a common understanding of the process before addressing issues and recommendations.

There are a number of unique challenges to supplying electricity: production must occur simultaneously with demand, demand varies greatly over the course of a day, week, and seasons, the costs of generation from different types of units vary greatly, and expected and unexpected conditions on the transmission network affect which generation units can

[1] September 30, 2005 order at P14**.**

be used to serve load reliably. Security constrained economic dispatch is an optimization process that takes account of these factors in selecting the generating units to dispatch to deliver a reliable supply of electricity at the lowest cost possible under given conditions.

The economic dispatch process occurs in two stages, or time periods: day-ahead unit commitment (planning for tomorrow's dispatch) and unit dispatch (dispatching the system in real time).

In the *unit commitment* stage, operators must decide which generating units should be committed to be on-line for each hour, typically for the next 24-hour period (hence the term "day ahead"), based on the load forecast. In selecting the most economic generators to commit, operators must take into account each unit's physical operating characteristics, such as how quickly output can be changed, maximum and minimum output levels, and minimum time a generator must run once it is started. Operators must also take into account generating unit cost factors, such as fuel and non-fuel operating costs and costs of environmental compliance.

In addition, forecasted conditions that can affect the transmission grid must also be taken into account to ensure that the optimal dispatch can meet load reliably. This is the "security" aspect of the commitment analysis. Factors that can affect grid capabilities include generation and transmission facility outages, line capacities as affected by loading levels and flow direction, and the weather. If the security analysis indicates that the optimal economic dispatch cannot be carried out reliably, relatively expensive generators may have to replace cheaper units.[2] Operators might perform the unit commitment analysis a few times during the day before actually committing generators for the next day dispatch.

In the *unit dispatch* stage, operators must decide in real time the level at which each available resource (from the unit commitment stage) should be operated, given the actual load and grid conditions, such that overall production costs are minimized. Actual conditions will vary from those forecasted in the day-ahead commitment and operators must adjust the dispatch accordingly. As part of real time operations, demand, generation, and interchange (imports and exports) must be kept in balance to maintain a system frequency of 60 Hz (per NERC standards). This is usually done by using Automatic Generation Control (AGC) to change the generation dispatch as needed. In addition, transmission flows must be monitored to ensure flows stay within reliability limits and voltage within reliability ranges. If transmission flows exceed accepted ranges, the operator must take corrective action, which could involve curtailing schedules, changing the dispatch, or shedding load. Operators may check conditions and issue adjusted unit dispatch instructions as often as every five minutes.

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[2] This is known as "out of merit" dispatch.

The manner in which transmission and operational limitations of generators have been represented in unit commitment and economic dispatch software has not been uniform across the industry. For example, some unit commitment software packages might represent the entire transmission network in detail while others might only represent selected transmission constraints to make the problem easier to solve. Similarly, the representation of unit operational constraints and in some cases even the network model might vary in economic dispatch software.

The economic dispatch problem is generally considered to be a mathematically simpler problem to solve although recent advances (e.g. the use of mixed-integer-programming (MIP) for unit commitment) have advanced the available technology to the point where many earlier limitations on problem size have been eliminated. Advances in hardware and software now make it technologically feasible to undertake security constrained economic dispatch over large regions.

In addition to differences in models used in economic dispatch software, a major factor that can impact the benefits of economic dispatch is whether or not all available resources are considered. In non-organized markets this may not always be possible due to various reasons including limitations in open access transmission tariffs based on Order 888.

Economic Dispatch in the South

The practice of economic dispatch in the South varies by utility and region. In most of the South, economic dispatch is performed on a system-by-system basis; in Texas it is performed on a multi control areas basis, and Southwest Power Pool is proposing its own form of a regional economic dispatch. Even though the South utilizes the same basic concept of next day unit commitment and real-time security constrained economic dispatch processes described in the prior section, there are variations in the implementation details as described below.

In addition to day-ahead unit commitment, Duke performs resource commitment studies over a seven-day period because of a large concentration of pump storage generation in its portfolio.[3] Due to the nature of pump storage generation, Duke needs to look not just at the forecasted conditions for the next day but also the expected conditions over the next week to determine the most effective way to operate those units. Duke also includes third party resources in its commitment and dispatching processes through its bulk power marketing function that is responsible for purchasing economic power.[4] In addition, Duke is implementing an Independent Entity for performing certain Open Access Transmission Tariff functions and an Independent Monitor for monitoring its transmission.

[3] Mr. Scott Henry – Duke, Transcript of Nov. 13, 2005 Board meeting, tr at 22.

[4] Id. at 26.

Entergy performs economic dispatch for its footprint in Arkansas, Louisiana, Mississippi, and Texas with a diverse generation resources portfolio and bilateral contracts for power purchases from non-utility generators. In addition to next day unit commitment, Entergy has broadened its use of market purchases in its commitment and dispatching processes through a Weekly Procurement Process to include independent power producers and other utilities.[5]

Southern Companies perform economic dispatch under a pooling arrangement for the generating resources of its operating companies in Alabama, Georgia, and Mississippi.[6] Each operating company makes its generating resources exclusively available for economic dispatch by the pool. The generation portfolio consists of diverse fuel type generation, and purchase power agreements with non-utility generators and other market participants through Southern term traders. [7]

Members of the Southwest Power Pool are considering implementing an Energy Imbalance Market within the SPP footprint. SPP will perform a real-time security constrained economic dispatch of the entire market footprint without respect to control areas. Currently, however, economic dispatch is performed individually by multiple control areas located in the SPP footprint. Each owner of generation performs its own economic dispatch for its portfolio of resources including generation, transactions, and demand side management.[8]

Economic dispatch in the Florida Reliability Coordinating Council is performed by eleven Balancing Authorities, (formerly referred to as control areas) through their own economic dispatch energy management system. This optimizes production costs for the balancing authority resources that are supplemented with wholesale "market" sales and purchases through bilateral transaction activity, and includes both utility and non-utility generation. One balancing authority in the region also acts as a "power pool" for its members.[9]

ERCOT is the only organized market in the South region. It consists of 10 control areas. In ERCOT there are two entities responsible for the dispatch of the system: qualified scheduling entities (QSEs) and ERCOT.[10] QSEs perform commitment and dispatch

[5] Mr. Hurstell – Entergy, tr at 28.

[6] Alabama Power Co., Georgia Power Co., Gulf Power Co., Mississippi Power Co., Savannah Electric and Power Co., and Southern Power Co.

[7] Mr. Graham, Jr. - Southern Companies filing comments, page 6.

[8] SPP: Stakeholder Panel - South filing comments, page 1.

[9] Florida Reliability Coordinating Council responses to DOE survey.

[10] Mr. Saathoff - ERCOT, tr at 63.

processes by both taking into account their portfolios and any other offers on the bilateral markets. ERCOT will then modify or supplement that dispatch to meet total system load, maintain system frequency and manage transmission congestion if necessary.

ERCOT meets its system needs by using ancillary service capacity and running a balancing energy market every 15 minutes which allows all generation, regardless of ownership, to bid and provide balancing energy. ERCOT manages transmission congestion with zonal and intra-zonal type arrangements. ERCOT is moving toward nodal pricing which will allow it to perform centralized day ahead commitment and economic dispatch processes based on bid prices.

Issues

This section describes the issues considered by the Joint Board, and identifies any recommended approaches for addressing these issues suggested in the record. This section also discusses the recommendations from the DOE report to Congress on the value of economic dispatch.

Below are the issues raised by utilities, independent power producers, market participants and transmission dependent utilities:

- Inclusion of non-utility generation in the dispatch
- Coordination of economic dispatch for all loads
- Independence of dispatcher
- Transparency of dispatch information and processes
- Market liquidity
- Transmission constraints
- Regional transmission planning and expansion

Inclusion of non-utility generation in the dispatch. In general, the majority of vertically integrated utilities in the region state that the current unit commitment and real–time economic dispatch processes are working fine and they are benefiting ratepayers in their areas.[11] Their unit commitment processes provide opportunity for third-party generation resources to participate through bilateral contracts in block offers to the extent that those resources elect to be included.

Independent power producers, market participants and transmission dependent utilities

[11] Mr. Scott Henry – Duke, tr at 26.
Mr. Hurstell - Entergy, tr. at 32.
Mr. Graham, Jr. – Southern Companies filing comments, page 20.

state that not all generation resources within vertically integrated utilities' footprint are included in the economic dispatch process. Non-utility generators say that dispatching only generation resources owned by one entity and purchasing power through bilateral contracts does not suggest that the system as a whole is economically dispatched nor does it suggest that the consumers are receiving energy at the least possible cost.[12] If the commitment and dispatch processes do not include all generation resources in a region, then load cannot have access to the most economic power and the transmission system will not be optimized. They suggest that including all generation resources regardless of ownership within each utility's footprint and in a broader region would be beneficial to consumers in the entire region.

Some observers say that a reason third-party generation resources are not included in the near real-time economic dispatch is because those resources are incapable of providing sufficient operational flexibility for regulation.[13] In addition, one utility argues that including all generators, regardless of ownership, into the economic dispatch would strip the states of their power to control whether their retail customers received lowest cost energy and could decrease reliability because some of those generators probably would not meet creditworthiness.[14]

Coordination of economic dispatch for all loads. Transmission dependent utilities[15] in the South are concerned that there is no coordinated economic dispatch that covers all loads within a utility's footprint to serve those loads. With Entergy's Weekly Procurement Process, the dispatching utility can take advantage of independent resources of its choosing to serve its own load, but the transmission dependent utility's network customers do not benefit from the process. Furthermore, during the Weekly Procurement Process, available flowgate capacity determination process for other transmission customers is closed down for about half a day, while the optimization analysis is being performed for the dispatching utility. Other transmission customers seeking alternative resources cannot have transmission reservation requests processed during this "blackout" period, and are able to use only available flowgate capacity that is left after the dispatching utility completes its resource selection.[16] This makes it difficult, especially for entities that are transmission dependent, to efficiently utilize their own resources, and

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[12] Mr. O'Connell – Williams, filing comments, page 3.
Ms. Turner - Union Power, filing comments page 2.
Mr. Sam Henry – SUEZ filing comments, page 1.

[13] Mr. Scott Henry - Duke, tr at 27.
Mr. Hurstell - Entergy, tr at 29.
Mr. Graham, Jr. – Southern Companies filing comments, page 16.

[14] Id., page 16.

[15] Mr. Priest – MDEA (Mississippi Delta Energy Agency), tr. at 34.
Mr. Beam – NCEMC (North Carolina Electric Membership Corp), tr at 38.

[16] Mr. Priest – MDEA, tr at 36.

prevents them from taking advantage of efficiencies in a broader wholesale market.

Independence of dispatcher. In addition to suggesting that all generation resources should be included in the economic dispatch process in order to improve benefits to consumers, non-utility generators further recommend that an independent organization should be responsible for implementing and operating the commitment and dispatch processes. An independent administrator will utilize the most efficient resources available regardless of ownership and optimize transmission capacity from sharing real-time information between the dispatch to the market participants. It also removes the skepticism that transmission owners favor their own resources over those of other stakeholders.[17] One utility argues that this Joint Board is not the forum to discuss whether an independent entity should regionally operate the transmission in the South[18].

Transparency of dispatch information and processes. Independent power producers also argue that an independent administrator will provide transparency of prices, allocation of transmission capacity and transmission congestion management through published business rules, interpretations and curtailment events.[19] The lack of visibility into transmission loading events hampers their ability to respond because they do not know whether making a certain adjustment will result in helping or hindering the particular problem that the dispatching utility is addressing. The other issue that hampers them in performing economic dispatch is their plants do not get access to the control signals necessary to perform certain function such as regulation.[20]

One utility argues that there is significant transparency in transmission information posted on Open Access Same Time Information System, including information pertaining to Total Transfer Capacity, Available Transfer Capacity, and transmission studies[21].

Market liquidity. One transmission dependent utility raises the issue that the South region has a very illiquid market for economic transactions.[22] Utilities still rely on phone calls for potential trading because there is no central clearing house and it is an inefficient system for optimizing resources at the lowest cost. One independent power producer argues that trading hubs in the south are less liquid than other hubs because they lack

[17] Mr. O'Connell – Williams, filing comments, page 4.
Ms. Turner - Union Power, filing comments, page 7.
Mr. Sam Henry – SUEZ filing comments, page 2.

[18] Mr. Graham, Jr. - Southern Companies, filing comments, page 20.

[19] Mr. O'Connell – Williams, filing comments, page 4.
Mr. Sam Henry – SUEZ, tr at 45, 46.

[20] Mr. O'Connell – Williams, tr at 52, 53.

[21] Mr. Graham, Jr. – Southern Companies filing comments, page 12.

[22] Mr. Beam – NCEM, filing comments, page 2.

transparency regarding transmission congestion management, transmission system operation, and price information. Limitation on transmission capacity is also a contributing factor.[23]

Transmission constraints. Because of transmission limitations in the South, transmission dependent utilities and Southwest Power Pool[24] say that the biggest impediment to economic dispatch is constraints on the transmission system. Transmission constraints can prevent efficient generation resources from being dispatched. These parties say they are frequently unable to access economic sources because of transmission limitations and often forgo economic transactions because of a concern that the transaction could be curtailed.

Regional transmission planning and expansion. Transmission dependent utilities suggest that transmission infrastructure in the South should be strengthened. One transmission dependent utility[25] recommends that regional planning and operation of the electric system beyond traditional control area boundaries is necessary to resolve many of these problems without mandating an RTO structure. For example, load-serving entities in North Carolina, in cooperation with the North Carolina Public Utilities Commission, recently established a transmission planning collaborative process to jointly plan the transmission system for network customers. Southwest Power Pool also states that without adequate regional transmission planning to expand and upgrade the capacity of transmission grid, economic dispatch cannot fully sustain its promised benefit.[26].

One utility argues that without participant funding or direct assignment of costs, expanding the transmission system so that all generators within the system can be incorporated into economic dispatch would be prohibitively expensive and place an undue burden on retail customers.[27]

Recommendations of the Joint Board for the South Region

[To be completed by the Board]

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[23] Mr. O'Connell – Williams, tr at 77,78.

[24] Mr. Beam – NCEMC, tr at 40.
Mr. Monroe – SPP, filing comments, page 2.
Mr. Sam Henry – SUEZ, filing comments page 2.

[25] Mr. Beam – NCEMC, tr at 41.

[26] Mr. Monroe – SPP, filing comments, page 3.

[27] Mr. Graham, Jr. – Southern Companies filing comments, page 12.

Attachment C

RECOMMENDATIONS FOR CONSIDERATION BY THE SOUTH JOINT BOARD

Recommendations Found in the Record of the South Joint Board

This is a list of various recommendations put forward by individual board members or by participants in the initial board meeting and comment process

- Improve the quality of trading hubs in the South by introducing a day ahead market and expand the scope of economic dispatch.[28]

- Create transparency with respect to the congestion management and transmission operation, together with transmission capacity expansion.[29]

- Establish an ICT to provide independent transmission planning for optimizing transmission construction for reliability as well as economy and to oversee system operation.[30] The ICT would help to eliminate some of the concerns raised by independent power producers and transmission dependent utilities.[31]

- Establish an independent monitor to monitor and prevent market power abuse.[32]

- Create an energy broker such as the Florida broker system or the automated interchange matching system used in the early '90s.[33]

- Review selected dispatch entities, including some investor-owned utilities, to determine how they conduct economic dispatch.[34] These reviews could document the rationale for all deviations from pure least cost, merit-order dispatch, and distinguish entity-specific and regional business practices from regulatory, environmental and

[28] Mr. Sam Henry – SUEZ, tr at 76.
[29] Mr. O'Connell – Williams, tr at 77, 78.
[30] Mr. Hurstell – Entergy, tr at 84; Mr. Beam – NCEMC, tr at 85
[31] Mr. Monroe – SPP, tr at 86.
[32] Id. At 87
[33] Mr. Beam – NCEMC, tr at 94
Mr. Hurstell – Entergy, tr at 95.

[34] *The Value of Economic Dispatch, A Report to Congress Pursuant to Section 1234 of the Energy Policy Act of 2005*, United States Department of Energy, November 7, 2005, page 52.

reliability-driven constraints.

- Recommend that FERC and DOE explore Electric Power Supply Association (EPSA) and Edison Electric Institute (EEI) proposals for more standard contact terms and encourage stakeholders to undertake these efforts.[35]

- Review current economic dispatch technology tools.[36] These tools include software and data used to implement economic dispatch, as well as the underlying algorithms and assumptions.

Additional Recommendations by Joint Board Members

- The Commission should conclude that there is no single appropriate method for performing economic dispatch and that the nature of economic dispatch can vary from region to region depending on local conditions.

- The Commission should conclude that utilities in the South appear to generally engage in security constrained economic dispatch.

- The Commission should conclude that unaffiliated generators and other entities that believe security constrained economic dispatch is not being performed appropriately have recourse at the state commissions to have unreasonable costs disallowed.

- The Commission should not address transmission expansion issues in its report because they are not within the scope of the Joint Boards' authority.

- Expanding the geographic scope of economic dispatch should not be implemented on an involuntary basis at this time.

[35] Id, p 51.

[36] Id, p 53.