# MONTHLY AUDIT REPORT ON THE SOUTHEAST ENERGY EXCHANGE MARKET

# August 2023

Prepared by:



Independent Market Auditor

September 29, 2023



#### I. OVERVIEW

This is the Auditor report for the month of August 2023 on the Southeast Energy Exchange Market (SEEM). SEEM is a regional energy market that uses a centralized intra-hour energy exchange to create bilateral trades among its trading participants. It has operated since November 2022 when the initial 18 members began trading. SEEM expanded in late June to include six new members: Seminole Electric Cooperative; Tampa Electric Company; Duke Energy Florida; Florida Power Corporation; TEA Gainesville Regional Utilities; and TEA JEA.<sup>1</sup> August is the second full month of participation by these new members. Trading volumes increased from 71,000 MWh in July to 86,000 MWh in August. The August trading volumes were substantially above the market-to-date monthly average of 48,000 MWh. This is expected given most months in the MktTD average are from when the footprint was smaller. SEEM relies on individual transmission segments connecting each member to evaluate and clear trades, including trades spanning multiple segments. Transmission availability on individual segments varied widely. For many segments capacity is available in every interval. For other segments, availability is zero in many intervals. Considering all intervals and segments, eight percent of the time availability was zero. Due to transmission constraints, transmission loss costs, and participant-specific constraints, about 4,000 MWh of potential economic exchanges were left uncleared in August. As explained herein, these are uncleared offers and bids in the same interval where the offer price was less than the bid price by more than the average cost of losses.

SEEM is an automated market accepts bids and offers from the SEEM members and clears individual bilateral trades every 15 minutes using available transmission capability (ATC) of the SEEM members under a transmission service designed for SEEM called Non-Firm Energy Exchange Transmission Service (NFEETS). The trades are cleared to maximize the trading benefit among all participants. The 15-minute trading extends the prevailing hour-ahead bilateral trading in the region and allows for fuller utilization of the transmission system.

SEEM is governed by the SEEM Membership Board. The automated architecture of SEEM was developed and is operated by Hartigen and who also serves as the SEEM Administrator. Our auditing role is directed by the Membership Board in accordance with elements specified in the Market Rules as developed by the Membership Board and approved by the Federal Energy Regulatory Commission (FERC). The results of our auditing are reported to the Membership Board through submission of this Monthly Report. We also have a duty under the Market Rules to

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<sup>&</sup>lt;sup>1</sup> The market opened in November 2022 with 18 members: Alabama Power Company; Georgia Power Company; Mississippi Power Company; Associated Electric Cooperative, Inc.; Dalton Utilities; Dominion Energy South Carolina, Inc.; Duke Energy Carolinas, LLC; Duke Energy Progress, LLC; Louisville Gas & Electric Company and Kentucky Utilities Company; North Carolina Municipal Power Agency Number 1; PowerSouth Energy Cooperative; North Carolina Electric Membership Corporation; Tennessee Valley Authority; Georgia System Operations Corporation; Georgia Transmission Corporation; Municipal Electric Authority of Georgia; Oglethorpe Power Corporation; and South Carolina Public Service Authority.



respond to inquiries made by regulators and other oversight authorities, including FERC. We received no such inquiries during the period of this report.

The SEEM auditing framework is based on the provisions of the SEEM Market Rules Section VI.D. (Auditing Process). These duties are in four main categories. The first duty is to analyze SEEM input, constraints, and matching results to determine if SEEM operates in accordance with the SEEM Rules (SEEM Rules Sections VI.D.1, VI.D.1.4). This is the main day-to-day auditing work and represents most of the activities reported herein.

A second auditing responsibility is ensuring participants have access to SEEM data in accordance with the SEEM Rules (Sections VI.D.2). Access to SEEM data involves allowing each SEEM participant to review its own bids and offers and to view matches made by the system. We are in receipt of the bid and offer data and have verified that this data is available daily.

A third area of responsibility is to report to the Membership Board regarding (1) the reliability and accuracy of the SEEM System, and (2) any complaints received from a Participant to the Membership Board and to investigate further any such complaint at the Board's direction (SEEM Rules Sections VI.D.3, VI.D.1.5). Section II of this report fulfils our duty to report on the reliability and accuracy of the SEEM system to the Board. Regarding reporting on complaints from participants, we did not receive any during the period of this report.

Finally, we have the duty to respond to written questions from Participants, FERC, NERC, state commissions in the region, Tennessee Valley Authority's Inspector General, and any other applicable regulators that oversee the electric operations of any Member regarding the integrity of the matching process (SEEM Rules Sections VI.D.6). We responded to a single request for clarification on transmission path names.

In the remainder of the report (Section II), we provide the results of our analysis of the first main area of responsibility: to analyze of input, constraints, and matching results to determine whether SEEM operates in accordance with the SEEM Rules. This is in two main parts. First, we review various daily screens that ensure specific inputs, constraints, and energy exchanges have met certain validation metrics. Second, we review the economic activity in SEEM to provide insight into its functioning and performance.



#### II. AUDITING RESULTS

In this section, we discuss the results of our monthly auditing. In subsection A, we show the results of our daily screening. In subsection B, we present an overview of the economic activity.

# A. Market Operation Screens

We calculate screens, metrics, and other analyses on a daily basis using market data and other data to meet the auditing obligations in the Market Rules. The screens and metrics are developed in accordance with specific Market Rules requirements and are divided into three main categories:

- Verification of bid/offer parameters;
- Evaluation of SEEM matching; and
- Verification of SEEM System Constraints.

The following three subsections describe the screens used for our auditing. Unless otherwise indicated, these screens are calculated daily for all fifteen-minute intervals.

#### 1. Bid/Offer Parameters

The following screens audit the information provided in participant bids and offers.

- Offers (bids) from a participant must have Participant-Specific Constraints identifying at least three other non-affiliated Participants that can be matched as counterparties;
- All offers and bids properly must include a source or sink;
- Each offer and bid must a delivery interval;
- Bids and offers must be 4 MW increments;
- "All or Nothing Selection" must be indicated; and
- The Network Map must be accurate (monthly).

## 2. Matching

The following screens are used to audit the SEEM matches:

- Match price must not exceed the bid price and must be greater than the offer price;
- Buyer and seller must be distinct participants;
- Participant-specific constraints must be check for any changes (monthly);
- SEEM benefit calculation must be verified;
- Any maximum offer price declared must bind the transaction; and
- Each match must have a NERC Tag.



#### 3. Constraints

The following screens audit the SEEM constraints.

- Transaction volume must not exceed offer or bid volume;
- The SEEM algorithm must only make energy exchanges that yield positive benefits to both buyer and seller; and
- Transaction volume over each segment must not exceed the segment ATC.

We have data transfer and storage architecture in place to receive data from the SEEM market to support the calculation of these screens. With the exception of screening the Network Map and the participant-specific constraints, the screens are calculated daily, and we have developed data processing procedures for each of the daily screens. We applied the screens to the August SEEM data and found that in all intervals the screens have indicated that requirements have been met.

For the monthly audit of the system map, we use the initial map developed by Hartigen and the SEEM working groups as a basis for comparing subsequent maps. This map is an electronic file of all sources, sinks, balancing areas, and SEEM transmission segments that comprise the SEEM system. A SEEM segment is an interface between two balancing areas and in many cases is synonymous with the path used by the system. In some cases, the segments are linked together to allow SEEM matches across multiple systems, forming a multi-segment path. The SEEM model allows any number of SEEM segments to be linked in order to find a beneficial trade.

By using this initial map as a basis of comparison, we will take advantage of the lengthy technical process used by SEEM and the SEEM members to develop the map and assume it is accurate. It would not be practicable to replicate this initial map. The SEEM model uses a static path configuration database to retrieve possible paths associated with the sources and sinks offered and bid in each interval. We saved a snapshot of this database and compared it to the path configuration database used at the start of each month. We identify and evaluate any changes. We found no changes in August and therefore we conclude the network map is accurate for the current sources and sinks participating in SEEM.

In a similar fashion, we evaluate changes to participant-specific constraints. These are counterparties and balancing areas acceptable to each participant for trades in SEEM, as well as any maximum price constraints. In each interval SEEM uses a set of participant-specific constraints for all participant bids and offers. We check each participant for any excluded sellers or buyers and any max price constraints and identify any constraints that changed during the month. There were a small number of changes to these constraints involving two entities expanding their counterparties to recently-added Florida members. No participants changed any maximum price constraints.

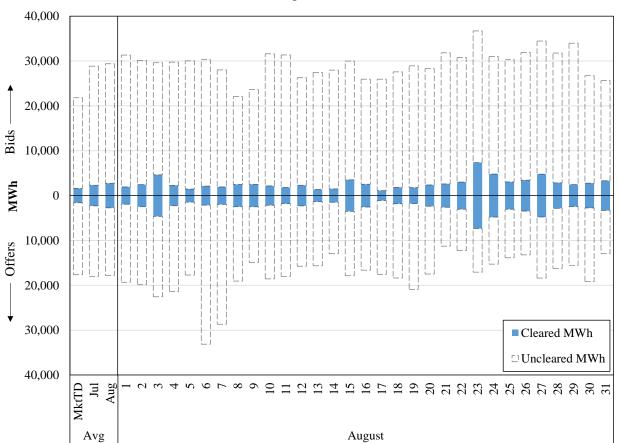


## B. Market Activity

In this section, we summarize and discuss SEEM operations and outcomes to illuminate any potential operating or market issues. Our evaluation is in two main areas. First, is an overall review of the market trading, including volumes, prices, and characteristics of participation. Second is an evaluation of network usage, focusing on the key transmission paths and constraints.

## 1. Market Outcomes

SEEM cleared 84,000 MWh of energy in August, averaging approximately 2,700 MWh per day. Figure 1 illustrates daily SEEM bids and offers for August. Each bar represents the daily total MWh volume of SEEM activity. The bids and offers are divided between cleared bids to buy (blue bar above the x axis) and cleared offers to sell (blue bars below the x axis). The transparent bar stacked above the bids and below the offers are the uncleared bids and offers. The left side columns show activity relative to the previous month and relative to the market to date (MktTD). MktTD is the monthly average of all months since SEEM began in November 2022 (i.e., the November 2022 – August 2023 average).



**Figure 1: Daily Bids and Offers**August 2023



The average daily bid and offer quantities were higher in August than in July and higher than the MktTD average. The increase relative to MktTD is linked to the new participants that started trading at the end of June. The increase in August over July was about 15,000 MWh. This continues the overall trend of increased participation since the SEEM opening in November 2022. As the left-side monthly and MktTD bars show, total liquidity (cleared and uncleared bids and offers) remained relatively steady. Prior to the Florida expansion in June, the MktTD average was 48,000 MWh. The volumes since June have been 71,000 MWh and 86,000 MWh, clearly higher as a result of new members.

Like in previous months, we evaluated the uncleared bids and offers and found a notable volume of uncleared bids and offers with economic overlap in the sense that in an interval there are uncleared bids whose bid price is greater than some uncleared offer prices in the same interval. Of course, most economic uncleared matches have a small bid-offer spread, and likely are not matched due to transmission losses that render the trade uneconomic. However, there are some economic uncleared matches with substantial spreads. Figure 2 shows a summary of the cleared and uncleared matches. Each stacked bar shows the SEEM matches and the economic unmatched at the given bid-offer spread. For example, the first bar shows SEEM matches bids exceed offers by up to \$1. The shadow boxes starting at the third bar show the uncleared economic bids and offers that did not clear even though the bid offer spread was greater than the average loss value of \$2.

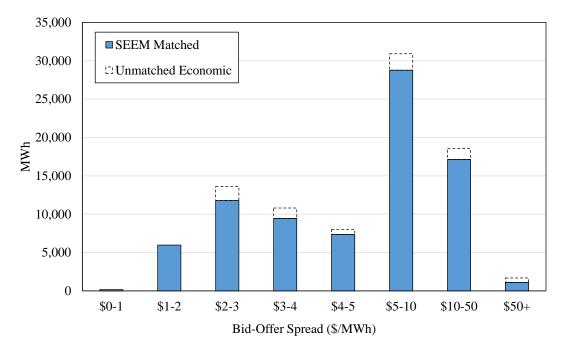


Figure 2: Cleared and Uncleared Economic Matches



About 8,000 MWh of bids/offers could settle at a price that could pay the average \$2/MWh losses. In July, the amount was 18,000 MWh.<sup>2</sup> Without a complex simulation, there is not a straightforward way to determine why these bids and offers did not clear. Among the possibilities are transmission constraints and the need to use segments that had higher-than-average cost of losses. Counterparty constraints could also explain unmatched bids and offers.

There are also rare instances when transactions are matched but fail to clear the transmission scheduling process. These instances are attributable to occasional delays in approving transmission service requests (TSRs), so the tag is denied for being late. It may also result from insufficient ATC when the TSR is processed. SEEM downloads ATC values from OASIS twice an hour, so it is possible that real-time changes occur that result in insufficient ATC by the time the TSR is submitted. These failed transactions were less than 1/10 percent of the total bid/offered quantities.

Figure 3 shows more detail on the matched bids and offers by showing the matches by market participant. Like the prior figure, the bars above the x axis are cleared bids and the bars below are cleared offers. The bars in this figure are divided by participant, each color corresponds to a different participant (whether the participant is a buyer or seller). We do not reveal the identity of the participants in order to respect commercial sensitivity.

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<sup>&</sup>lt;sup>2</sup> We originally reported the July economic uncleared as 28,000 MWh. We have since revised our method to identify uncleared economic matches that results ed in lower volume.



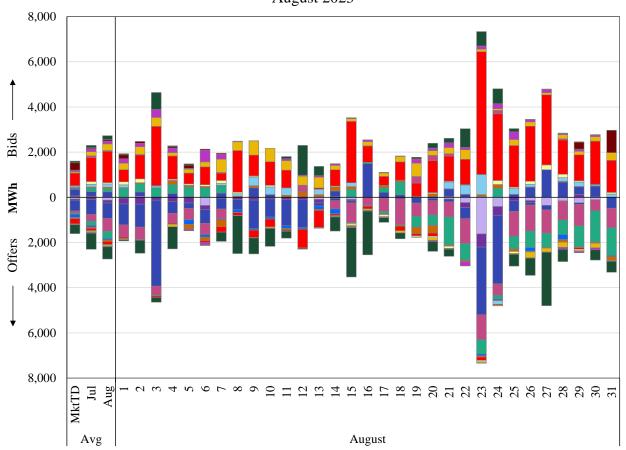
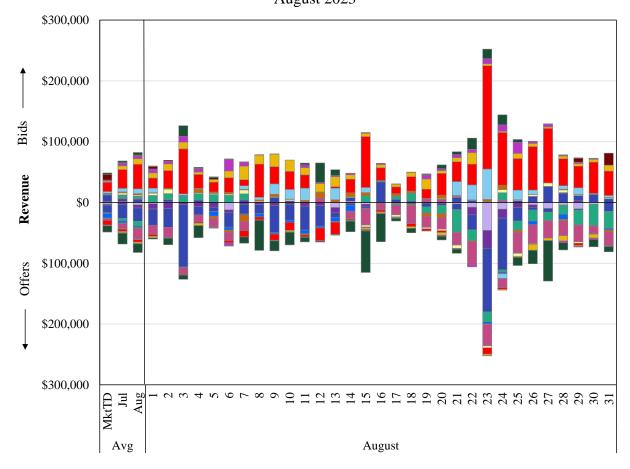


Figure 3: Volumes of Matched Bids and Offers August 2023

Figure 3 shows certain buyers and sellers comprise significant shares of the transaction activity. Twenty-five percent of the sales were made by a single participant and the two largest sellers accounted for 37 percent of the volume. On the buyer side, the largest buyer accounted for 51 percent of the cleared volume and the top two buyers accounted for 61 percent. Our findings in previous months indicate that the most active participants vary from month-to-month, both in identity and sales share, as can be observed by the left bar charts showing monthly and Market-to-Date (MktTD) averages. With the addition of new participants these concentration statistics have fallen since June.

Figure 4 is similar to Figure 3, but shows the revenues of matched transactions rather than the volumes. These are highly correlated with the transaction volumes shown in Figure 3.



**Figure 4: Revenues of Matched Transactions**August 2023

# 2. Network Usage

In this subsection, we report on the usage of the SEEM network. Figure 4 shows the average daily peak-hour prices for August and the prices on the highest-priced and lowest-priced paths for each day. Figure 6 is the same figure but for off-peak hours.

The figures show in the left column the August prices compared to the previous period. It shows the average prices for are roughly equal to the prices in July but are lower than the average since market opening. This downward price trend is likely the result of sustained lower natural gas prices.



Figure 5: Average SEEM Clearing Prices: System-Wide and by Path Peak Hours – August 2023

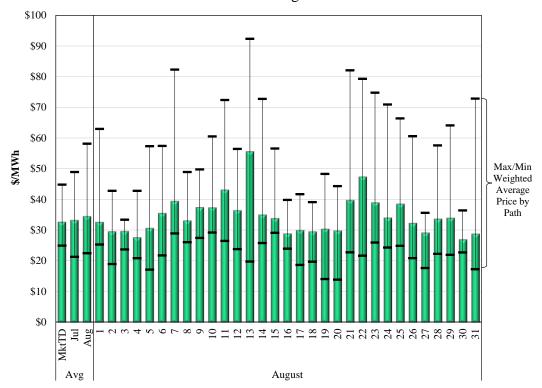
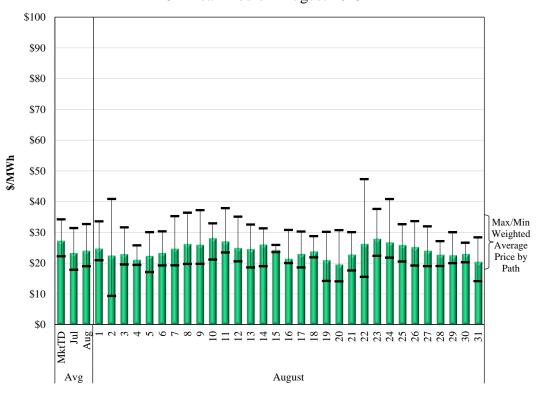


Figure 6: Average SEEM Clearing Prices: System-Wide and by Path Off-Peak Hours – August 2023





The two figures show that the value of transactions can vary significantly by path, mainly because transmission constraints can contribute to higher prices between different locations. If a constraint prevents higher total flows between two (beneficial trading) areas, the average transaction price will be higher than if sufficient transmission capability was available to allow all beneficial trades to clear between the areas.

Accordingly, we evaluate SEEM transactions by path segments. SEEM trades among participants using ATC. We gathered ATC and trading statistics for all SEEM segments available to the model. With the addition of new members in June, SEEM uses 240 unique segments. We evaluated path data including the median, maximum, and minimum ATC values over all intervals for each segment, as well as the total MWh that cleared over each segment. We calculate a "loading factor" based on the scheduled transactions and ATC on the segment during each 15-minute interval. It is the portion of the path used in that interval relative to the maximum amount that could have been used based on the ATC.

Table 1 shows an excerpt of our statistics. The table displays the 36 segments that had more than 1,000 MWh of transactions scheduled during the month. The full data for all segments with at least 20 MWh scheduled during the month is provided in Appendix A. In addition to the ATC and schedule volumes, the Table also shows how each segment was utilized by interval during the month, *to wit*, the interval was either:

- (1) Partially used (MWs cleared were less than ATC);
- (2) Fully Used, ATC was used up for the interval;<sup>3</sup>
- (3) Unavailable, no ATC;4 and
- (4) Uncleared (no schedules on the segment).

In reporting the usage of each segment, we refer to a "segment-intervals" which is an observation in a single interval on one segment. During the month, total segment intervals is the product of all 240 segments and the number of intervals during the month. In August, there were 714,240.<sup>5</sup> Of this total, the most common case in the data was case (4), where ATC was available, but the segment was not used because no beneficial transactions were cleared by the SEEM model over the intervals. These cases represent 642,858 segment intervals or 90 percent of all segment-intervals. The second most common case was case (3), where ATC was not sufficient to clear any SEEM transactions (56,389). The third most common case was case (1), intervals where the

<sup>&</sup>lt;sup>3</sup> ATC less the MW schedule was less than 4 MW (i.e., no additional SEEM transaction could be cleared).

<sup>&</sup>lt;sup>4</sup> ATC was less than 4 MW at the start of the interval.

<sup>&</sup>lt;sup>5</sup> The maximum number of segment intervals in a month is (240 segments x 4 intervals x 24 hours x #days in the month). This is the maximum because occasionally the system requires shutting down for short periods to perform upgrades and other patches. In August, SEEM operated in all intervals.



segment was partially used (14,722). Finally, in a small number of intervals, case (2) prevailed where the segment was completely scheduled in the interval (271).

**Table 1: Most Utilized SEEM Segment Statistics** 

Segment	ATC				Loading	Partially Used		Fully U	Jsed	Unavailable		Uncleared	
Segment	Min	Median	Max	MWhs	Factor	Intervals	%	Intervals	%	Intervals	%	Intervals	%
S/CPL/CPLE-DUK//	836	3,911	6,877	17,945	0.006201	681	23%	0	0%	0	0%	2295	77%
F/TEC/TEC-FPC//	0	1,421	2,377	17,687	0.017351	1,581	53%	0	0%	4	0%	1391	47%
SS/SOCO/FL-SOCO//	252	488	734	16,893	0.047482	1,062	36%	0	0%	0	0%	1914	64%
S/DUK/CPLE-SOCO//	0	1,828	2,335	15,465	0.011626	649	22%	0	0%	1	0%	2326	78%
SS/SOCO/TVA-SOCO//	719	1,207	1,362	14,461	0.016324	413	14%	0	0%	0	0%	2563	86%
F/FPC/TEC-SOCO//	0	178	212	11,870	0.123171	1,073	36%	4	0%	828	28%	1071	36%
S/TVA/TVA-SOCO//	0	2,875	3,000	11,554	0.005690	313	11%	0	0%	8	0%	2655	89%
SS/SOCO/DUK-SOCO//	0	700	1,035	10,734	0.021944	346	12%	27	1%	13	0%	2590	87%
F/FPC/FPC-SOCO//	0	178	212	10,045	0.104399	567	19%	39	1%	828	28%	1542	52%
F/JEA/SOCO-JEA//	0	550	828	9,107	0.023087	1,114	37%	9	0%	92	3%	1761	59%
S/DUK/TVA-DUK//	0	692	692	5,950	0.012804	224	8%	7	0%	123	4%	2622	88%
F/FPC/TEC-FPC//	0	1,470	2,426	5,817	0.005503	707	24%	0	0%	4	0%	2265	76%
S/TVA/TVA-DUK//	0	333	333	5,323	0.023269	160	5%	0	0%	188	6%	2628	88%
S/AECI/AECI-TVA//	0	668	911	3,947	0.008553	141	5%	13	0%	104	3%	2718	91%
S/SCEG/SCEG-SOCO//	831	2,641	99,999	2,852	0.001380	308	10%	0	0%	0	0%	2668	90%
S/TVA/AECI-SOCO//	0	340	387	2,766	0.012483	111	4%	1	0%	216	7%	2648	89%
SS/SOCO/SOCO-FL//	1	1,033	1,500	2,475	0.003552	270	9%	4	0%	2	0%	2700	91%
S/TVA/DUK-TVA//	0	333	333	2,342	0.010764	99	3%	0	0%	64	2%	2813	95%
S/DUK/CPLE-TVA//	120	692	692	2,228	0.004598	75	3%	1	0%	0	0%	2900	97%
S/TVA/SOCO-TVA//	0	2,376	3,000	2,164	0.001442	73	2%	6	0%	308	10%	2589	87%
S/CPL/CPLE-SC//	0	1,972	4,319	2,107	0.001422	96	3%	0	0%	3	0%	2877	97%
S/DUK/DUK-SOCO//	0	1,776	2,335	1,959	0.001524	350	12%	0	0%	1	0%	2625	88%
P/LGEE/LGEE-TVA//	0	1,623	1,623	1,838	0.001649	177	6%	2	0%	146	5%	2651	89%
S/SC/CPLE-SOCO//	1,807	3,458	3,683	1,776	0.000710	68	2%	0	0%	0	0%	2908	98%
F/JEA/JEA-SOCO//	0	497	605	1,680	0.005228	305	10%	0	0%	40	1%	2631	88%
SS/SOCO/SOCO-SOCO//	39,640	43,556	43,556	1,523	0.000047	108	4%	0	0%	0	0%	2868	96%
S/MEAG/DUK-MEAG//	0	117	228	1,484	0.017648	108	4%	13	0%	24	1%	2831	95%
SS/SOCO/SCEG-SOCO//	0	167	197	1,481	0.012065	130	4%	10	0%	3	0%	2833	95%
SS/SOCO/DUK-FL/MULTIPATHALIAS/	0	622	1,035	1,456	0.003395	177	6%	7	0%	15	1%	2777	93%
S/DUK/SOCO-DUK//	0	1,993	2,264	1,362	0.001059	128	4%	0	0%	168	6%	2680	90%
S/TVA/LGEE-SOCO//	0	2,648	2,648	1,316	0.000687	96	3%	0	0%	4	0%	2876	97%
S/SC/SOCO-SC//	0	1,915	2,460	1,291	0.000942	87	3%	0	0%	4	0%	2885	97%
F/TEC/FPC-TEC//	0	2,226	3,129	1,214	0.000798	120	4%	0	0%	36	1%	2820	95%
SS/SOCO/SC-SOCO//	257	449	571	1,153	0.003423	72	2%	0	0%	0	0%	2904	98%
S/MEAG/FPC-MEAG//	0	67	267	1,072	0.016933	96	3%	11	0%	34	1%	2835	95%
SS/GTC/SCEG-GTC//	0	91	107	1,006	0.015248	85	3%	1	0%	92	3%	2798	94%

These statistics indicate that among these most utilize segments, ATC remains available for SEEM trades. For example, many of the top paths have over 90 percent of their intervals uncleared. There are, however, numerous instances when segments are constrained. A constrained segment is one where either ATC is insufficient (less than 4 MW) prior to SEEM matching, or the segment is completely used by SEEM in at least one interval during the hour. These two circumstances (Cases (2) and (3)) occur in over 56,000 segment-intervals and almost always because the ATC is insufficient to schedule (i.e., ATC < 4 MW) rather than because it is filled by a SEEM match.

Further insight on constrained segments can be gained from Table 2. It shows the segments most often unavailable to SEEM (i.e., unavailable at least 20 percent of the intervals). Like in previous months, paths that are unavailable due to no ATC, are generally unused when they are available.



The incidence of transmission capacity constraints decreased between July and August, as measured by the percentage of constrained segment intervals (11 percent in July and 8 percent in August).

**Table 2: Most Constrained SEEM Segments** 

G	ATC				Loading	Partially Used		Fully Used		Unavailable		Uncleared	
Segment	Min	Median	Max	MWhs	U	Intervals	%	Intervals	%	Intervals	%	Intervals	%
F/JEA/SEC-JEA/SSN-JEA/	0	0	0	0	N/A	0	0%	0	0%	2,976	100%	0	0%
S/TVA/CPLW-AECI//	0	0	276	16	0.000571	2	0%	0	0%	2,493	84%	481	16%
S/TVA/SOCO-CPLW//	0	0	276	0	0.000000	0	0%	0	0%	2,272	76%	704	24%
S/TVA/AECI-CPLW//	0	0	276	5	0.000088	1	0%	0	0%	2,120	71%	855	29%
S/TVA/CPLW-DUK//	0	0	276	0	0.000000	0	0%	0	0%	2,108	71%	868	29%
S/TVA/DUK-CPLW//	0	0	276	0	0.000000	0	0%	0	0%	2,092	70%	884	30%
S/TVA/CPLW-LGEE//	0	0	276	0	0.000000	0	0%	0	0%	2,080	70%	896	30%
S/TVA/TVA-CPLW//	0	0	276	85	0.001385	4	0%	0	0%	2,080	70%	892	30%
S/TVA/LGEE-CPLW//	0	0	276	41	0.000665	4	0%	0	0%	2,076	70%	896	30%
S/TVA/CPLW-SOCO//	0	0	276	67	0.001079	3	0%	0	0%	2,076	70%	897	30%
S/TVA/CPLW-TVA//	0	0	276	169	0.002723	7	0%	0	0%	2,076	70%	893	30%
S/CPL/TVA-CPLW//	0	0	276	0	0.000000	0	0%	0	0%	1,903	64%	1073	36%
S/CPL/CPLW-TVA//	0	0	276	0	0.000000	0	0%	0	0%	1,894	64%	1082	36%
S/CPL/TVA-DUK//	0	0	276	131	0.001760	8	0%	1	0%	1,889	63%	1078	36%
S/CPL/DUK-TVA//	0	0	276	252	0.003379	12	0%	0	0%	1,887	63%	1077	36%
S/AECI/TVA-AECI//	0	0	911	103	0.000940	9	0%	0	0%	1,628	55%	1339	45%
S/MEAG/MEAG-SC//	0	32	71	46	0.002041	4	0%	1	0%	1,092	37%	1879	63%
F/FPC/SOCO-FPC/SOCO-FPCS/	0	100	480	0	0.000000	0	0%	0	0%	928	31%	2048	69%
F/FPC/SOCO-TEC//	0	100	480	561	0.005040	50	2%	4	0%	928	31%	1994	67%
F/FPC/SOCO-FPC//	0	100	480	616	0.005511	114	4%	36	1%	920	31%	1906	64%
F/FPC/SOCO-SEC/SOCO-SSN/	0	100	480	0	0.000000	0	0%	0	0%	920	31%	2056	69%
F/FPC/SOCO-GVL//	0	100	292	0	0.000000	0	0%	0	0%	920	31%	2056	69%
F/FPC/SEC-SOCO/SSN-SOCO/	0	178	212	0	0.000000	0	0%	0	0%	840	28%	2136	72%
F/FPC/SEC-SOCO/SSO-SOCO/	0	176	212	0	0.000000	0	0%	0	0%	832	28%	2144	72%
F/FPC/FPC-SOCO//	0	178	212	10,045	0.104399	567	19%	39	1%	828	28%	1542	52%
F/FPC/GVL-SOCO//	0	178	212	0	0.000000	0	0%	0	0%	828	28%	2148	72%
F/FPC/TEC-SOCO//	0	178	212	11,870	0.123171	1,073	36%	4	0%	828	28%	1071	36%
S/TVA/SOCO-AECI//	0	287	600	15	0.000072	1	0%	0	0%	784	26%	2191	74%
S/TVA/DUK-AECI//	0	286	333	48	0.000314	6	0%	0	0%	776	26%	2194	74%
S/TVA/TVA-AECI//	0	287	600	0	0.000000	0	0%	0	0%	776	26%	2200	74%
S/TVA/LGEE-AECI//	0	288	600	24	0.000111	2	0%	0	0%	732	25%	2242	75%



# III. CONCLUSION

We reviewed the operation of SEEM for August 2023. We have developed operational procedures to validate the market rules and constraints of SEEM. All of our screens have been validated and we conclude the SEEM operated within the rules and constraints. We also have evaluated the SEEM outcomes and have not identified significant operating issues.



# Appendix A

# SEEM Path Usage

_		ATC		Loading		Partially Used		Fully Used		Unavailable		Uncleared	
Segment	Min	Median	Max	MWhs	Factor	Intervals	%	Intervals	%	Intervals	%	Intervals	%
S/CPL/CPLE-DUK//	836	3,911	6,877	17,945	0.006201	681	23%	0	0%	0	0%	2295	77%
F/TEC/TEC-FPC//	0	1,421	2,377	17,687	0.017351	1,581	53%	0	0%	4	0%	1391	47%
SS/SOCO/FL-SOCO//	252	488	734	16,893	0.047482	1,062	36%	0	0%	0	0%	1914	64%
S/DUK/CPLE-SOCO//	0	1,828	2,335	15,465	0.011626	649	22%	0	0%	1	0%	2326	78%
SS/SOCO/TVA-SOCO//	719	1,207	1,362	14,461	0.016324	413	14%	0	0%	0	0%	2563	86%
F/FPC/TEC-SOCO//	0	178	212	11,870	0.123171	1,073	36%	4	0%	828	28%	1071	36%
S/TVA/TVA-SOCO//	0	2,875	3,000	11,554	0.005690	313	11%	0	0%	8	0%	2655	89%
SS/SOCO/DUK-SOCO//	0	700	1,035	10,734	0.021944	346	12%	27	1%	13	0%	2590	87%
F/FPC/FPC-SOCO//	0	178	212	10,045	0.104399	567	19%	39	1%	828	28%	1542	52%
F/JEA/SOCO-JEA//	0	550	828	9,107	0.023087	1,114	37%	9	0%	92	3%	1761	59%
S/DUK/TVA-DUK//	0	692	692	5,950	0.012804	224	8%	7	0%	123	4%	2622	88%
F/FPC/TEC-FPC//	0	1,470	2,426	5,817	0.005503	707	24%	0	0%	4	0%	2265	76%
S/TVA/TVA-DUK//	0	333	333	5,323	0.023269	160	5%	0	0%	188	6%	2628	88%
S/AECI/AECI-TVA//	0	668	911	3,947	0.008553	141	5%	13	0%	104	3%	2718	91%
S/SCEG/SCEG-SOCO//	831	2,641	99,999	2,852	0.000333	308	10%	0	0%	0	0%	2668	90%
S/TVA/AECI-SOCO//	0	340	387	2,766	0.012483	111	4%	1	0%	216	7%	2648	89%
SS/SOCO/SOCO-FL//	1	1,033	1,500	2,475	0.012483	270	9%	4	0%	2	0%	2700	91%
S/TVA/DUK-TVA//	0	333	333	2,342	0.003332	99	3%	0	0%	64	2%	2813	95%
S/DUK/CPLE-TVA//	120	692	692	2,228	0.010704	75	3%	1	0%	0	0%	2900	97%
S/TVA/SOCO-TVA//	0	2,376	3,000	2,164	0.004338	73	2%	6	0%	308	10%	2589	87%
S/CPL/CPLE-SC//	0	1,972	4,319	2,104	0.001442	96	3%	0	0%	3	0%	2877	97%
S/DUK/DUK-SOCO//	0	1,776	2,335	1,959	0.001422	350	12%	0	0%	1	0%	2625	88%
P/LGEE/LGEE-TVA//	0	1,623	1,623	1,838	0.001324	177	6%	2	0%	146	5%	2623	89%
	1,807							0		0			
S/SC/CPLE-SOCO//	0	3,458	3,683	1,776	0.000710	68	2%	-	0%	_	0%	2908	98%
F/JEA/JEA-SOCO// SS/SOCO/SOCO-SOCO//	39.640	497	605	1,680	0.005228	305	10%	0	0%	40	1%	2631	88%
	,	43,556	43,556	1,523	0.000047	108	4%	0	0%	0	0%	2868	96%
S/MEAG/DUK-MEAG//	0	117	228	1,484	0.017648	108	4%	13	0%	24	1%	2831	95%
SS/SOCO/SCEG-SOCO//	0	167	197	1,481	0.012065	130	4%	10	0%	3	0%	2833	95%
SS/SOCO/DUK-FL/MULTIPATHALIAS/	0	622	1,035	1,456	0.003395	177	6%	7	0%	15	1%	2777	93%
S/DUK/SOCO-DUK//	0	1,993	2,264	1,362	0.001059	128	4%	0	0%	168	6%	2680	90%
S/TVA/LGEE-SOCO//	0	2,648	2,648	1,316	0.000687	96	3%	0	0%	4	0%	2876	97%
S/SC/SOCO-SC//	0	1,915	2,460	1,291	0.000942	87	3%	0	0%	4	0%	2885	97%
F/TEC/FPC-TEC//	0	2,226	3,129	1,214	0.000798	120	4%	0	0%	36	1%	2820	95%
SS/SOCO/SC-SOCO//	257	449	571	1,153	0.003423	72	2%	0	0%	0	0%	2904	98%
S/MEAG/FPC-MEAG//	0	67	267	1,072	0.016933	96	3%	11	0%	34	1%	2835	95%
SS/GTC/SCEG-GTC//	0	91	107	1,006	0.015248	85	3%	1	0%	92	3%	2798	94%
SS/GTC/DUK-GTC//	0	372	650	981	0.003743	42	1%	10	0%	202	7%	2722	91%
SS/SOCO/SOCO-TVA//	639	2,843	3,949	796	0.000402	23	1%	0	0%	0	0%	2953	99%
S/TVA/AECI-TVA//	0	339	387	795	0.003596	28	1%	0	0%	216	7%	2732	92%
SS/SOCO/FL-TVA/MULTIPATHALIAS/	252	488	734	749	0.002105	47	2%	0	0%	0	0%	2929	98%
S/MEAG/SOCO-MEAG//	2,671	2,941	3,195	715	0.000327	43	1%	0	0%	0	0%	2933	99%
S/CPL/SCEG-CPLE//	0	632	632	672	0.001641	113	4%	1	0%	50	2%	2812	94%
S/CPL/CPLE-SCEG//	0	412	412	657	0.002541	46	2%	0	0%	292	10%	2638	89%
F/FPC/FPC-TEC//	0	2,266	3,169	653	0.000420	66	2%	0	0%	24	1%	2886	97%
SS/GTC/SOCO-GTC//	12,786	13,226	14,660	649	0.000066	58	2%	0	0%	0	0%	2918	98%
SS/GTC/FPC-GTC//	0	303	462	624	0.002997	58	2%	6	0%	20	1%	2892	97%
S/SCEG/CPLE-SOCO//	140	475	99,999	620	0.001538	43	1%	0	0%	0	0%	2933	99%
F/FPC/SOCO-FPC//	0	100	480	616	0.005511	114	4%	36	1%	920	31%	1906	64%
F/FPC/SOCO-TEC//	0	100	480	561	0.005040	50	2%	4	0%	928	31%	1994	67%
SS/SOCO/FL-SC/MULTIPATHALIAS/	25	159	476	536	0.004900	67	2%	2	0%	0	0%	2907	98%
S/SCEG/SCEG-CPLE//	500	672	99,999	463	0.000842	83	3%	0	0%	0	0%	2893	97%
S/TVA/LGEE-DUK//	0	333	333	457	0.001888	97	3%	0	0%	36	1%	2843	96%
SS/GTC/TVA-GTC//	0	287	321	444	0.002151	27	1%	3	0%	8	0%	2938	99%
S/CPL/DUK-CPLE//	479	3,346	6,575	440	0.000175	94	3%	0	0%	0	0%	2882	97%
SS/GTC/SC-GTC//	136	170	216	426	0.003326	35	1%	2	0%	0	0%	2939	99%



Appendix A (continued)

		ATC	тррс	IIUIX I	A (cont	Partially		Fully U	sed	Unavail	able	Uncleared	
Segment	Min	Median	Max	MWhs	Loading Factor	Intervals	%	Intervals	%	Intervals		Intervals	%
SS/SOCO/SCEG-FL/MULTIPATHALIAS/	0	167	197	417	0.003496	82	3%	0	0%	5	0%	2889	97%
S/SCEG/SCEG-DUK//	535	684	99,999	386	0.000687	65	2%	0	0%	0	0%	2911	98%
S/TVA/AECI-DUK//	0	326	333	381	0.001888	24	1%	5	0%	260	9%	2687	90%
S/MEAG/MEAG-SOCO//	2,498	2,660	2,930	363	0.001080	24	1%	0	0%	0	0%	2952	99%
S/SC/DUK-SC//	1,081	2,365	2,861	350	0.000199	68	2%	0	0%	0	0%	2908	98%
S/SC/CPLE-SC//	554	2,106	3,343	331	0.000213	28	1%	0	0%	0	0%	2948	99%
S/DUK/DUK-SC//	0	1,579	2,788	331	0.000279	67	2%	0	0%	3	0%	2906	98%
S/DUK/SCEG-DUK//	0	663	664	265	0.000574	44	1%	0	0%	122	4%	2810	94%
SS/SOCO/FL-DUK/MULTIPATHALIAS/	89	476	712	263	0.000794	47	2%	0	0%	0	0%	2929	98%
S/MEAG/TVA-MEAG//	45	86	217	255	0.003300	18	1%	5	0%	0	0%	2953	99%
S/CPL/DUK-TVA//	0	0	276	252	0.003379	12	0%	0	0%	1,887	63%	1077	36%
S/DUK/CPLE-CPLW//	0	466	554	252	0.000866	12	0%	0	0%	171	6%	2793	94%
SS/SOCO/FL-SCEG/MULTIPATHALIAS/	33	107	160	244	0.003238	42	1%	0	0%	0	0%	2934	99%
SS/GTC/JEA-GTC//	0	303	462	234	0.001124	46	2%	0	0%	20	1%	2910	98%
S/DUK/DUK-TVA//	0	692	692	219	0.000453	37	1%	0	0%	1	0%	2938	99%
S/SCEG/SOCO-CPLE//	500	672	99,999	197	0.000358	30	1%	0	0%	0	0%	2946	99%
S/DUK/TVA-CPLE//	0	692	692	191	0.000411	45	2%	0	0%	155	5%	2776	93%
S/DUK/SOCO-CPLE//	0	2,062	2,264	191	0.000141	47	2%	0	0%	200	7%	2729	92%
S/MEAG/MEAG-JEA//	0	192	266	189	0.00111	29	1%	0	0%	223	7%	2724	92%
S/SCEG/SOCO-SCEG//	0	990	99,999	186	0.000246	19	1%	0	0%	351	12%	2606	88%
S/TVA/CPLW-TVA//	0	0	276	169	0.002723	7	0%	0	0%	2,076	70%	893	30%
SS/SOCO/TVA-FL/MULTIPATHALIAS/	1	972	1,362	167	0.0002723	28	1%	2	0%	2	0%	2944	99%
S/MEAG/SCEG-MEAG//	11	19	23	157	0.010742	8	0%	30	1%	0	0%	2938	99%
SS/SOCO/TVA-DUK/MULTIPATHALIAS		573	957	151	0.000358	8	0%	0	0%	0	0%	2968	100%
S/CPL/TVA-DUK//	0	0	276	131	0.001760	8	0%	1	0%	1,889	63%	1078	36%
S/SC/SC-SOCO//	452	2,762	3,547	119	0.000058	119	4%	0	0%	0	0%	2857	96%
S/MEAG/SC-MEAG//	0	43	100	111	0.002666	11	0%	6	0%	16	1%	2943	99%
S/DUK/SCEG-SOCO//	479	663	664	109	0.000223	18	1%	0	0%	0	0%	2958	99%
S/MEAG/MEAG-TVA//	0	139	198	108	0.001222	9	0%	0	0%	192	6%	2775	93%
S/CPL/SC-CPLE//	0	1,743	2,880	104	0.000084	56	2%	0	0%	46	2%	2874	97%
S/AECI/TVA-AECI//	0	0	911	103	0.000940	9	0%	0	0%	1,628	55%	1339	45%
SS/SOCO/SC-FL/MULTIPATHALIAS/	1	435	571	95	0.000307	27	1%	0	0%	2	0%	2947	99%
S/MEAG/MEAG-DUK//	0	81	159	94	0.001533	12	0%	1	0%	72	2%	2891	97%
S/TVA/DUK-SOCO//	0	333	333	92	0.000414	7	0%	0	0%	20	1%	2949	99%
SS/SOCO/SOCO-DUK//	89	573	957	89	0.000211	21	1%	0	0%	0	0%	2955	99%
S/DUK/CPLW-DUK//	0	248	862	85	0.000462	4	0%	0	0%	121	4%	2851	96%
S/TVA/TVA-CPLW//	0	0	276	85	0.001385	4	0%	0	0%	2,080	70%	892	30%
SS/GTC/GTC-SOCO//	20,000	20,000	20,000	75	0.000005	4	0%	0	0%	0	0%	2972	100%
S/TVA/CPLW-SOCO//	0	0	276	67	0.001079	3	0%	0	0%	2,076	70%	897	30%
S/MEAG/JEA-MEAG//	0	67	267	60	0.000948	18	1%	0	0%	34	1%	2924	98%
S/SC/SOCO-CPLE//	0	2,269	3,149	57	0.000034	17	1%	0	0%	4	0%	2955	99%
S/SC/SC-DUK//	1,323	2,397	3,616	50	0.000028	50	2%	0	0%	0	0%	2926	98%
S/TVA/DUK-AECI//	0	286	333	48	0.000314	6	0%	0	0%	776	26%	2194	74%
S/DUK/SC-DUK//	0	1,819	2,920	47	0.000036	47	2%	0	0%	119	4%	2810	94%
S/SC/SC-CPLE//	287	2,550	3,722	47	0.000025	47	2%	0	0%	0	0%	2929	98%
S/MEAG/MEAG-SC//	0	32	71	46	0.002041	4	0%	1	0%	1,092	37%	1879	63%
S/DUK/CPLW-CPLE//	0	255	962	46	0.000230	5	0%	0	0%	37	1%	2934	99%
S/MEAG/GTC-MEAG//	1,613	1,985	2,183	45	0.000031	5	0%	0	0%	0	0%	2971	100%
SS/GTC/GTC-MEAG//	9,546	9,914	9,999	45	0.000006	5	0%	0	0%	0	0%	2971	100%
S/TVA/LGEE-CPLW//	0	0	276	41	0.000665	4	0%	0	0%	2,076	70%	896	30%
SS/GTC/GTC-DUK//	0	371	601	40	0.000147	4	0%	0	0%	4	0%	2968	100%
S/SCEG/CPLE-SCEG//	122	475	99,999	37	0.000093	3	0%	0	0%	0	0%	2973	100%
SS/SOCO/SOCO-SCEG//	33	107	160	36	0.000478	2	0%	1	0%	0	0%	2973	100%
S/MEAG/MEAG-GTC//	2,488	2,686	3,058	30	0.000015	2	0%	0	0%	0	0%	2974	100%
SS/GTC/MEAG-GTC//	8,657	8,787	9,152	30	0.000005	2	0%	0	0%	0	0%	2974	100%
S/TVA/LGEE-AECI//	0	288	600	24	0.000111	2	0%	0	0%	732	25%	2242	75%
S/MEAG/MEAG-FPC//	0	192	266	22	0.000111	4	0%	0	0%	223	7%	2749	92%
S/DUK/SOCO-TVA//	120	692	692	20	0.000041	5	0%	0	0%	0	0%	2971	100%