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Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E., Room 1A
Washington, D.C. 20426

Re: PJM Interconnection, L.L.C., Docket No. ER19-1958-003
Informational Report on Interconnection Study Performance Metrics

Dear Secretary Bose:

Pursuant to the Federal Energy Regulatory Commission's ("Commission" or "FERC") Order No. 845, Order No. 845-A, and Order No. 845-B[1] and PJM Interconnection, L.L.C.'s ("PJM") Open Access Transmission Tariff ("Tariff"), Part IV, Subpart A, section 41.6, PJM hereby submits this informational report to inform the Commission of PJM's interconnection study performance. As discussed below and as described in PJM's prior informational reports and its recent submission of Tariff revisions for interconnection process reform, PJM has been experiencing an increase in the number of New Service Requests received each year leading to a record-high volume of projects under study, which directly impacts, on a cascading basis, PJM's study process and timing.[2] Specifically, as outlined in greater detail below, there were 425 New

[1] *Reform of Generator Interconnection Procedures and Agreements*, Order No. 845, 163 FERC ¶ 61,043 (2018), *order on reh'g*, Order No. 845-A, 166 FERC ¶ 61,137, *order on reh'g*, Order No. 845-B, 168 FERC ¶ 61,092 (2019) (collectively, "Order No. 845").

[2] *See PJM Interconnection, L.L.C.*, Informational Report on Interconnection Study Performance Metrics, Docket No. ER19-1958-003 (Feb. 16, 2021) ("February 16 Report"); *PJM Interconnection, L.L.C.*, Informational Report on Interconnection Study Performance Metrics, Docket No. ER19-1958-003 (Aug. 16, 2021) ("August 16 Report"); *PJM Interconnection, L.L.C.*, Informational Report on Interconnection Study Performance Metrics, Docket No. ER19-1958-003 (Feb. 14, 2022) ("February 14 Report"); *PJM Interconnection, L.L.C.*, Tariff Revisions for Interconnection Process Reform, Docket No. ER22-2110-000 (June 14, 2022) ("June 14 Filing"). There are a number of reasons for this record increase in New Service Requests. One such factor is Congress' continuing extensions of the production tax credit and investment tax credit for renewable energy resources passed in the Consolidated Appropriations Act,

Service Requests submitted from October 1, 2021 through June 30, 2022. Consequently, as of June 30, 2022, PJM has 2,710 active projects at various points in the study process representing approximately 163 gigawatts. The installed capacity on the PJM system is approximately 183,000 megawatts ("MW").

Given this ever-increasing volume of New Service Request submissions and the ripple effect on older projects progressing through the queue, as noted in the February 14 Report, PJM reprioritized its study workload to focus on older projects. PJM at the same time has been working diligently with its stakeholders since the fall of 2020 to reform PJM's interconnection process. PJM and its stakeholders were able to reach consensus enabling PJM to submit the June 14 Filing with the Commission to transition to an entirely new PJM first-ready, first-serve interconnection process. In preparation for the transition to the new process, PJM has focused on processing overdue System Impact Studies, retooled results for previously released System Impact Studies, and late Facilities Studies. Additionally, PJM has continued efforts to process customer requests for equipment and Point of Interconnection ("POI") modifications. PJM undertook this reprioritization in order to focus on moving projects which already had completed earlier stages through to a final Facilities Study. This reprioritization, although beneficial to focus on the most mature projects in the queue, did have the ancillary impact of PJM exceeding the performance target of 25 percent for all study types. In the near term, PJM remains focused on the current effort of issuing late System Impact Studies, retooled System Impact Studies, and Facilities Studies,

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2021, Pub. L. No. 116-260, 134 Stat. 1182 (2020) (enacting the Taxpayer Certainty and Disaster Tax Relief Act of 2020 as Division EE, which amended Sections 45 and 38 of the Internal Revenue Code with regard to the production tax credit and investment tax credit). *See 2022 Renewable Energy Industry Outlook*, Deloitte, at 2-7 (Nov. 17, 2021), https://www2.deloitte.com/content/dam/Deloitte/us/Documents/energy-resources/us-eri-renewable-energy-outlook-2022.pdf (describing growth in renewable development, due in part to public policy and environmental, sustainability, and governance considerations, reduced costs, and technological changes).

which will facilitate the transition to the new interconnection process proposed in the June 14 Filing, and increase cost certainty for customers.

With the foregoing in mind, PJM is submitting this report to the Commission to describe the reasons that PJM exceeded its Feasibility, System Impact, and Facilities Study deadlines again in the first 2022 six-month reporting period ending on June 30. As discussed below, PJM's overall work plan addresses all study backlogs for all study types, and includes: (1) continued staff hiring, and realignment of the PJM departments supporting the interconnection process; (2) developing implementation of the transition plan to the new interconnection process in accordance with PJM's June 14 Filing, pending the Commission's acceptance of same; and (3) exploring other opportunities to improve internal work flow. The foregoing work plan elements demonstrate a continued commitment to enhance PJM's focus on the interconnection study backlog.

Additionally, pursuant to Tariff, Part IV, Subpart A, section 41.6(b), PJM presents the aggregate total number of employee hours and third party consultant hours expended towards interconnection studies within its coordinated region for the first 2022 six-month reporting period, ending June 30, 2022.

I. BACKGROUND

As described in PJM's prior informational reports,[3] on December 19, 2019, the Commission issued an order[4] addressing PJM's May 22, 2019 compliance filing[5] submitted in response to Order No. 845. In the December 19 Order, the Commission accepted, in full, the

[3] *See supra* note 2.

[4] *PJM Interconnection, L.L.C.*, 169 FERC ¶ 61,226 (2019) ("December 19 Order"), *order on compliance & reh'g*, 171 FERC ¶ 61,145 (2020).

[5] *PJM Interconnection, L.L.C.*, Order Nos. 845 and 845-A Compliance Filing, Docket No. ER19-1958-000 (May 22, 2019).

proposed modifications to the provisions of PJM's Tariff related to maintaining statistics on the timing of processing interconnection studies, effective April 1, 2020. Specifically, the Commission accepted PJM's proposal to add a new Tariff, Part IV, Subpart A, section 41, Interconnection Study Statistics, to the Tariff to calculate processing statistics for Feasibility Studies, System Impact Studies, Facilities Studies, and queue withdrawals. The Commission also accepted PJM's three requested independent entity variations to: (1) permit PJM to calculate interconnection study metrics on a six-month basis instead of quarterly, consistent with PJM's existing six-month queue cycle; (2) permit PJM to submit an informational report for the next two consecutive six-month reporting periods to the extent that PJM exceeds the 25 percent threshold for two six-month reporting periods; and (3) permit PJM to not include a link on its OASIS site to the website where PJM maintains the summary of statistics related to processing interconnection studies.[6]

Pursuant to PJM's new Tariff, Part IV, Subpart A, section 41, Interconnection Study Statistics, as of January 2020, PJM began tracking on six-month reporting period cycles the statistics related to Feasibility Studies, System Impact Studies, Facilities Studies, and queue withdrawals. In the event PJM exceeds the allowable performance metric standards for two consecutive six-month reporting periods, PJM must comply with new Tariff, Part IV, Subpart A, section 41.6, which states:

> **41.6 Additional Compliance Requirements**
>
> In the event that any of the values calculated in Tariff, Part IV, Subpart A, section 41.1(e), Tariff, Part IV, Subpart A, section 41.2(e) or Tariff, Part IV, Subpart A, 41.3(e) exceeds 25 percent for two consecutive reporting periods, Transmission Provider will have to comply with the measures below for the next two (2) six-month reporting periods and must continue reporting this information until

[6] December 19 Order at PP 65-70.

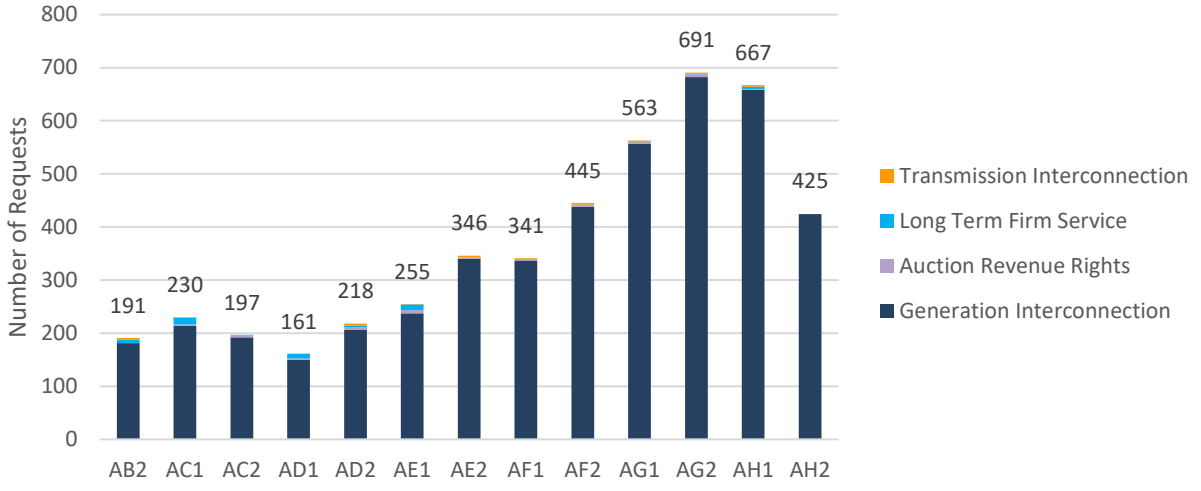
> Transmission Provider reports two (2) consecutive six-month reporting periods without the values calculated in Tariff, Part IV, Subpart A, section 41.1(e), Tariff, Part IV, Subpart A, section 41.2(e) or Tariff, Part IV, Subpart A, 41.3(e) exceeding 25 percent for two (2) consecutive six-month reporting periods:
>
> (a) Transmission Provider must submit a report to the Commission describing the reason for each study or group of clustered studies pursuant to an Interconnection Request that exceeded its deadline (i.e., 45, 90 or 180 days) for completion (excluding any allowance for Reasonable Efforts). Transmission Provider must describe the reasons for each study delay and any steps taken to remedy these specific issues and, if applicable, prevent such delays in the future. The report must be filed at the Commission within 45 days of the end of the reporting period.
>
> (b) Transmission Provider shall aggregate the total number of employee hours and third party consultant hours expended towards interconnection studies within its coordinated region that reporting period and post on its website. This information is to be posted within thirty (30) days of the end of the reporting period.[7]

PJM's study process and timing is directly impacted by the extremely high volume of New Service Request submissions that PJM has received in each queue window in recent years. Noting the Tariff soft close requirements,[8] PJM's six-month queue cycles run from April 1 through September 30 and October 1 through March 31. Table 1 below illustrates the increasing total number of New Service Requests submitted in each queue window in recent years.

[7] Tariff, Part IV, Subpart A, section 41.6.

[8] *See, e.g.*, Tariff, Part IV, section 36.1.01(3).

TABLE 1: TOTAL NEW SERVICES REQUESTS BY APPLICATION TYPE



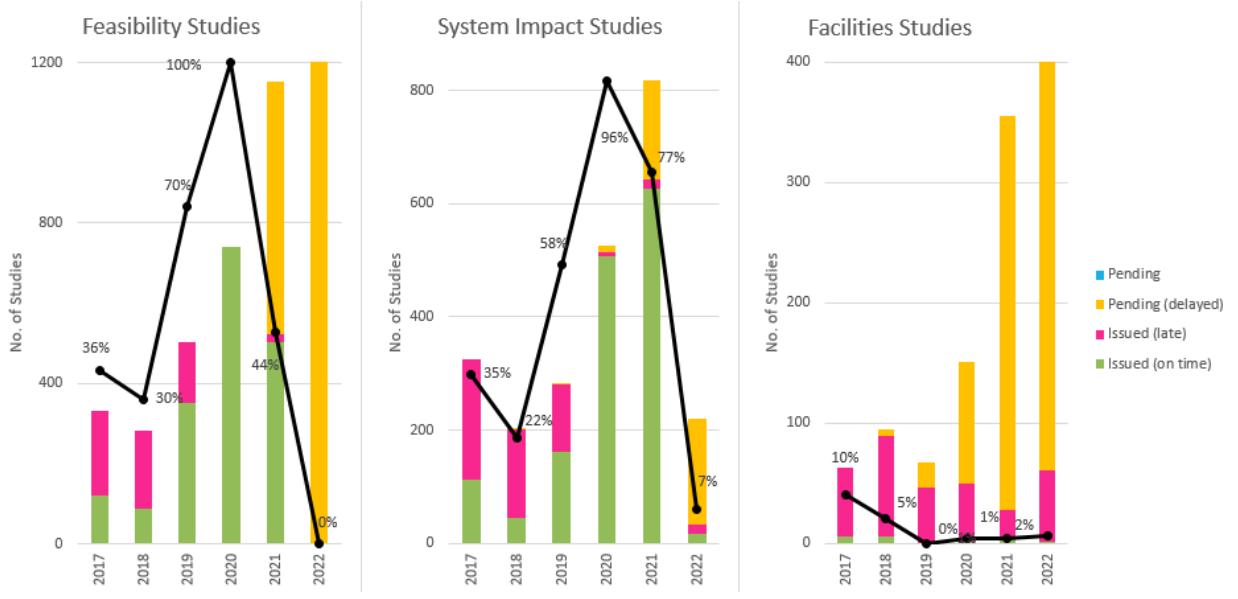
The most recently completed New Services Queue, AH2, which closed on March 31, 2022, contained 425 New Services Requests. PJM believes that number was less than the AH1 New Services Queue as a result of industry-wide knowledge of the anticipated June 14 Filing seeking to reform PJM's entire interconnection process. While that number was less than the AH1 New Services Queue, the number of requests in the AH2 New Services Queue still exceeds the number of requests in every New Services Queue prior to the AF1 New Services Queue (April 1, 2019 to September 30, 2019), and Table 1 continues to demonstrate the remarkable overall increase in New Service Requests in recent years.[9]

While PJM cannot be certain, as noted above, PJM believes most of the increase in New Service Requests is driven by Congress' extension of the Production Tax Credits and Investment Tax Credits for renewable resources, as well as other factors including state renewable portfolio standards, state incentive programs, corporate green incentives, and decreasing costs for inverter-

[9] Given the potential passage of the Inflation Reduction Act of 2022, it seems clear that the number of interconnection requests will continue to grow dramatically in future years.

based technology. As PJM noted in its prior informational reports and the June 14 Filing,[10] this increasingly high volume of New Service Request submissions has a direct impact on PJM's study process and timing, as depicted in Table 2, below.

TABLE 2: STUDY VOLUME AND ON TIME RATE AS OF JUNE 30, 2022



A high volume of incoming studies continued through June 30, 2022, even as the transition to the new process was considered, and ultimately supported, by PJM stakeholders. As such, consistent with PJM's prior informational reports and the June 14 Filing,[11] PJM continued to focus efforts on issuing late System Impact Studies, retooled results for previously released System Impact Studies, and late Facilities Studies instead of focusing its review on the new Feasibility Studies (AH1 and beyond) or new System Impact Studies (AG2). Despite the growing number of backlogged Feasibility and System Impact studies, new incoming staff have now been trained, significant System Impact retool work has been accomplished, and the number of Facilities Studies

[10] *See* June 14 Filing at 21-22; February 14 Report at 6; August 16 Report at 6; February 16 Report at 6.

[11] *See supra* note 2.

tendered through June 30, 2022 increased over the prior six months by approximately 214 percent. Since January 1, 2021, PJM has augmented its interconnection staff by approximately 50 percent and still has openings currently posted on pjm.com to fill. PJM has also increased its outside contractor staff by 25 percent since January 1, 2021.

As discussed below, it is vital that PJM prioritize clearing the Facilities Study backlog for the older projects to improve actionable analysis results and cost certainty for the newer queued projects whose costs are dependent on the specific cost assignment to older queued facilities, which needs to occur before Feasibility Studies can be issued to the newer queued projects. As noted in PJM's prior informational reports[12] and in more detail below, at the Facilities Study stage there is a focus on conceptual design by the Transmission Owners, stability analyses are conducted, and attachment facilities and network upgrades specifications are refined. The Facilities Study duration and, consequently, the completion date, is dependent upon a number of moving parts. Significant aspects include the queue volume, specific complexities within the transmission owner zones, the demand for System Impact Study retool analyses, restudies due to withdrawn projects, additional studies as required to accommodate the type of technology proposed, proposed technological changes that are not otherwise Permissible Technological Advancements, and other Material Modification evaluations.

II. INFORMATIONAL REPORT ON PJM INTERCONNECTION STUDY METRICS

The following sections address in further detail: (A) PJM's interconnection study performance; (B) Feasibility, System Impact and Facilities Study delays in the six-month reporting period ending June 30, 2022; (C) steps taken and proposed solutions regarding Feasibility, System

[12] *See supra* note 2.

Impact, and Facilities Study delays; and (D) personnel hours expended towards interconnection studies.

A. Metric Results

As noted above, PJM currently conducts its queues on a six-month basis.[13] Normally, PJM takes at least one month after the closing of each queue to complete scoping meetings and its baseline model build and then another 90 days to complete the Feasibility Study.

As discussed in the February 14 Report,[14] generally, Feasibility Studies issued on time will have a System Impact Study report due 210 days later, i.e., 30 days to return the executed System Impact Study Agreement, 60 days to build the model, and 120 days to perform the study. Projects whose Feasibility Studies are delayed will have a System Impact Study due 150 days later, i.e., 30 days to return the executed System Impact Study Agreement and 120 days to perform the System Impact Study. For late System Impact Studies, PJM is able to use a previously constructed model, and forego the dedicated two-month model build. The Facilities Study is the only study cycle with a deadline tied directly to the execution of the Facilities Study Agreement. The Facilities Studies start the day after the Facilities Study Agreement is due to PJM.[15]

With the foregoing in mind and in consideration of PJM's reprioritization of work consistent with PJM's prior informational reports and the June 14 Filing,[16] the following tables show the metrics for the past five six-month reporting periods (ending with the first 2022 six month

[13] *PJM Interconnection, L.L.C.*, 139 FERC ¶ 61,079, at P 19 (2012) (accepting PJM's six-month queue cycle and the need for a 30-day baseline development period).

[14] February 14 Report at 8.

[15] Tariff, Part IV, Subpart A, section 207.

[16] *See supra* note 2.

reporting period) for the Feasibility Studies, System Impact Studies, and Facilities Studies:[17]

TABLE 3: FEASIBILITY STUDIES
Ref. Tariff, Part IV, Subpart A, section 41.1

	2020		2021		2022
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Studies completed (A)	321	425	505	18	0
Studies completed late (B)	3	1	9	10	0
Studies currently delayed (C)	1	0	11	633	1,216
Average completion time, days	88	86	87	192	-
Performance rate ([B+C]/[A+C])	1.2%	0.2%	3.9%	98.8%	100%

TABLE 4: SYSTEM IMPACT STUDIES
Ref. Tariff, Part IV, Subpart A, section 41.2

	2020		2021		2022
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Studies completed (A)	304	300	322	282	16
Studies completed late (B)	35	22	15	31	16
Studies currently delayed (C)	53	47	66	193	186
Average completion time, days	186	168	142	171	624
Performance rate ([B+C]/[A+C])	24.6%	19.9%	20.9%	47.2%	100%

TABLE 5: FACILITIES STUDIES
Ref. Tariff, Part IV, Subpart A, section 41.3

	2020		2021		2022
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Studies completed (A)	25	50	39	47	60
Studies completed late (B)	25	46	38	46	59
Studies currently delayed (C)	135	212	322	455	453
Average completion time, days	747	821	590	740	798
Performance rate ([B+C]/[A+C])	100%	98.5%	99.7%	99.8%	99.8%

[17] All data in the tables for Feasibility, Studies, System Impact Studies, and Facilities Studies is based on current information in the PJM Planning database as of July 12, 2022, and may reflect updates to previously published data based on the latest information.

As reflected in the above Table 3, Table 4, and Table 5 metrics, PJM's performance with regard to the Feasibility, System Impact Studies and Facilities Studies exceeded the 25 percent threshold for the six-month cycle ending on June 30, 2022.[18] As indicated in Tables 3 and 4, PJM exceeded the 25 percent threshold for the Feasibility and System Impact Studies for only the last two six-month cycles, including the cycle ending June 30, 2022. In accordance with Tariff, Part IV, Subpart A, section 41.6, since this is only the second six-month cycle where the threshold was exceeded for the Feasibility and System Impact Studies, the following sections of this report will only address these performance metrics generally at this time. As noted above, however, the change in Feasibility and System Impact Studies metrics simply reflects PJM's decision to reprioritize work, allowing PJM to predominantly focus on Facilities Studies backlogs and prepare for the transition to the new rules in accordance with the June 14 Filing, should it be accepted by the Commission, as requested, on October 3, 2022.

As indicated in Table 5 above, PJM exceeded the 25 percent threshold for the Facilities Studies for all five six-month cycles, including the cycle ending June 30, 2022. Accordingly, pursuant to Tariff, Part IV, Subpart A, section 41.6, the following section of the informational report focuses on the Facilities Study delays for the first 2022 six-month reporting period ending June 30, 2022. However, the overall solutions to address the Facilities Study delays are equally applicable to addressing the present delays for the Feasibility and System Impact Studies.

[18] These interconnection study metrics are posted on the PJM website. *Interconnection Studies Statistics*, PJM Interconnection, L.L.C. (July 29, 2022), https://pjm.com/-/media/planning/services-requests/interconnection-study-statistics.ashx.

B. Feasibility, System Impact and Facilities Study Delays in First 2022 Six-Month Reporting Period, Ending June 30, 2022, and Proposed Solutions

As shown in Table 3 above, in the first 2022 six-month cycle ending in June 30, 2022, PJM did not complete any Feasibility Studies. Following the interconnection reform proposal set forth in the June 14 Filing,[19] and as discussed with PJM's stakeholders in the Interconnection Process Reform Task Force ("IPRTF"), the 1,216 Feasibility Studies which are currently delayed will be addressed as part of the transition process should the Commission accept the June 14 Filing. Similarly, Table 4 above shows that in the first 2022 six-month cycle ending in June 30, 2022, PJM completed 16 late System Impact Studies. Reprioritizing away from the AG2 System Impact studies that would normally be completed during this time frame, PJM instead focused on the System Impact Studies from previous queue cycles. The 16 late studies represent projects that are receiving a report for the first time, but significantly more time was spent on projects that were retooled. These retooled projects required significant effort, including the consideration of withdrawal impacts caused by projects that had already signed a PJM three-party service agreement (e.g., an Interconnection Service Agreement, Wholesale Market Participant Agreements, etc.).[20] PJM's Interconnection Analysis groups have completed approximately 826 retooled studies in the AD1 through AG1 queues, including load flow, short circuit and stability analysis. In addition to the retooled studies, PJM's Interconnection Analysis groups have also been addressing reviews of suspension requests, project output reductions, point of interconnection

[19] *See supra* note 2.

[20] The Interconnection Process Reform Task Force has redesigned the retool requirement, which is meant to ensure that project interdependencies are addressed and communicated, to improve efficiency. PJM is also investing in new internal software tools to better support retool efforts.

changes and fuel changes. In 2022, approximately 103 material modification reviews were performed for these types of requests, and there are approximately 105 studies still pending.

As set forth in Table 5 above, in the first 2022 six-month cycle ending in June 30, 2022, PJM completed 59 Facilities Studies after the applicable study deadline and 453 Facilities Studies were delayed.[21] Even though the number of Facilities Studies tendered by PJM increased in the first half of 2022 by 214 percent, the Facilities Study backlog remained nearly the same - at 453 projects. The present study backlog continues to reflect the cumulative rolling impact of PJM's present first-in, first-out process wherein the AE2, AF1, and AF2 queue Facilities Studies were due in 2021 and 2022—inflating the backlog numbers even as PJM completed 60 Facilities Studies and had another 148 projects withdraw from PJM's queue.

Delays of Facilities Studies and System Impact Studies are generally impacted by the following drivers: (1) PJM analysis delays (including those caused by customer withdrawals); (2) customer modification requests or data changes; and (3) delays in receiving the information from the Transmission Owners.

1. PJM analysis delay

Consistent with the February 14 Report, Facilities Studies and System Impact studies were delayed and issued late as a result of PJM analysis delays. As PJM works to finalize and produce the System Impact Studies and Facilities Studies for older queued projects, those projects may elect to withdraw upon considering their project-specific results. Withdrawals of earlier queued projects require PJM to conduct restudies of the transmission system to determine the corresponding impact to later queued projects. The restudies alter the required work for the

[21] A complete listing of the Facilities Studies issued after the applicable study deadline, as well as currently delayed Facilities Studies, is set forth in Appendix A and Appendix B, attached hereto and made a part hereof.

Transmission Owners because reliability criteria violations may no longer exist, eliminating the need for an upgrade or reducing the magnitude of a reliability criteria violation. Consequently, PJM also needs to reflect the updated required scope of work in the studies. Because of PJM's queue priority (first-in, first-out), PJM must address the projects with older queue positions before PJM can begin the restudies for the newer queued projects.

By way of recent example, the Dominion Energy transmission zone was affected by the withdrawal of the AC1-107 project, representing a 1600 MW combined cycle generating plant. The AC1-107 project had a significant impact in the region, including on roughly a dozen 230 kilovolt ("kV") and 500 kV transmission facilities in the Dominion Energy zone. The total reinforcement costs to mitigate the reliability violations in the area was over $205 million. With the withdrawal of AC1-107, all interconnection queue projects that had a contribution to the overload of these facilities will need to be restudied to re-allocate cost responsibility. Over 176 projects are waiting for Facilities Studies in the Dominion Energy zone and restudies are now required for many of those projects before their Facilities Studies can be completed, driving further delays.[22]

Additionally, due to the extent of the backlog, projects in later queues that have delayed Facilities Studies are awaiting a restudy by PJM based on the actions of earlier queued interconnection projects. The first-in, first-out nature of queue priority for the PJM New Services Queue limits the ability to complete later queued studies on time when those projects are dependent on upgrades from earlier projects. Even in the absence of a dependent upgrade, due to the first-in, first-out nature of queue priority, PJM is required to re-assess subsequent projects and identify any

[22] This information is available on the PJM website. *New Services Queue*, PJM Interconnection, L.L.C., https://pjm.com/planning/services-requests/interconnection-queues (last visited Aug. 15, 2022).

change in project requirements or cost based on the actions of earlier queued projects. Compounding the analysis delays are the increases in volume of New Service Request submissions experienced throughout all of PJM, as discussed above. PJM's and Transmission Owners' personnel and respective consultants who are dedicated to interconnection studies must perform each of the study phases. As a consequence, personnel must constantly shift study priorities across multiple queues and study phases, increasing overhead and complexity, while also decreasing efficiency and delaying the timing of the overall process.

As explained in the February 14 Report,[23] as the number of proposed generation facilities increases, the transmission system upgrades increase in scope to mitigate the system performance issues caused by the additional generation. For example, a single generator may overload a transmission line that is mitigated by a small scope equipment replacement, such as a discrete wave trap equipment replacement on a transmission line. This scope of work improves the line rating while not changing the power flow across the system, which simplifies the required work for subsequent projects. The combined impact of additional generators will increase the transmission line loading requiring a larger upgrade, such as rebuilding the entire transmission line. This scope of work also impacts the system utilization for later queued projects and requires an in-depth evaluation of the system. Further complicating the process is the potential for withdrawal of an earlier queued interconnection request. The withdrawal triggers the need for a new set of analysis, typically of the region, and could alter the scope of the previously identified transmission system upgrades. This iterative study process must continue until interconnection projects execute an

[23] February 14 Report at 12-13.

Interconnection Service Agreement to ensure each customer constructs the minimum upgrades required to support the proposed generation.

2. Customer modification requests/data changes

As discussed in the February 14 Report,[24] the PJM interconnection process provides flexibility for Interconnection Customers to modify the equipment and configuration of the proposed facilities. Each change requires PJM to reanalyze the project to assess the impacts on the transmission system and determine if the change materially impacts any later interconnection project. PJM has observed that the evolution of generator and inverter technology requires Interconnection Customers change the facility data. Based upon recent manual tracking data, PJM processed 98 equipment and/or configuration modification requests and has a backlog of 220 equipment and/or configuration modification requests. PJM has pursued a new internal metrics format for tracking study progress, including material modifications requests. With PJM implementation of this new format, the number of customer requests as well as their priority will be more readily available and accessible.

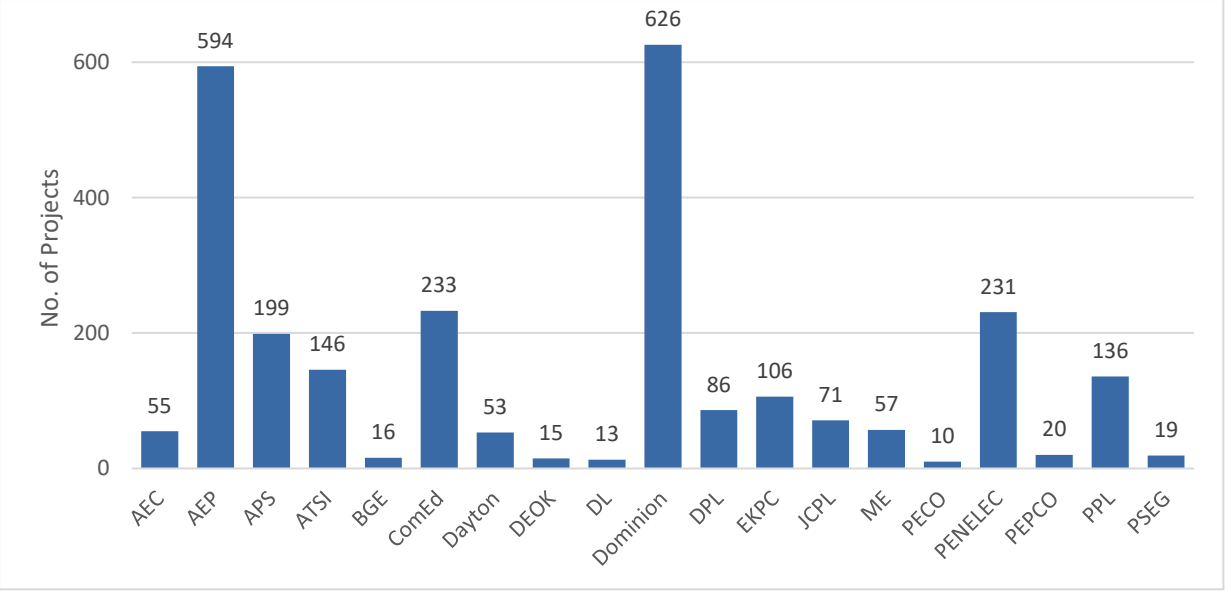
3. Transmission Owner backlog

As explained in the February 14 Report,[25] each New Service Request requires a number of PJM and Transmission Owner personnel and consultant resources. Similar to PJM, some Transmission Owners have been greatly impacted by the remarkable increase in volume of New Service Requests. The chart below reflects the current number of projects under study by Transmission Owner zones with 10 or more projects therein.

[24] February 14 Report at 13.

[25] February 14 Report at 14-15.

TABLE 6: CURRENT PROJECTS UNDER STUDY BY TRANSMISSION OWNER ZONES WITH 10 OR MORE PROJECTS



As set forth in the February 14 Report,[26] particularly in the case of Facilities Studies, PJM is reliant on the work of the Transmission Owners. The Facilities Study phase is a preliminary engineering phase that typically involves a field visit by the Transmission Owner to further scope the proposed upgrades identified in the System Impact Study phase and refine cost estimates so that the Interconnection Customer is better informed regarding potential security requirements and construction timing. These field visits are time consuming as they require a visual inspection for the location of interconnection facilities and existing facilities that will be upgraded to support the interconnection project. In areas with a high volume of New Service Requests, Transmission Owner staff may be required to schedule a number of field visits around other critical work to maintain system safety and reliability.

[26] February 14 Report at 14.

As depicted in Table 6 above, with the exception of Atlantic City Electric Company ("AEC") and Duke Energy of Ohio and Kentucky ("DEOK"), since the February 14 Report, all Transmission Owners have had an increase in the number of projects currently under study. Some Transmission Owners (e.g., Virginia Electric and Power Company ("Dominion") and American Electric Power Service Corporation ("AEP")) have seen a larger increase in the volume of interconnection requests in their zones as compared to others. The majority of Transmission Owner backlog is in the Facilities Study phase, and the volume is overwhelming Transmission Owner staff in terms of the number of field visits required to conduct the studies and other time required to finalize the studies. The delays are also related to the volume of projects some Transmission Owners are experiencing on their seams with non-PJM Transmission Owners, which has required some affected system coordination.

C. Proposed Solutions to Delays

As discussed in the February 14 Report and as set forth in the June 14 Filing,[27] PJM has been exploring multiple overall reforms to the interconnection process and specific options to mitigate the delayed Facilities Studies, including:

1. Increased personnel and internal organizational realignment

During the first half of 2022, PJM hired four new full-time employees dedicated to the interconnection process within PJM's Infrastructure Planning sub-division of PJM Planning. All of those filled positions were new positions just added to the PJM organization. This represents a 12 percent staffing increase year over year for the Infrastructure Planning sub-division. In addition to filling positions for employees lost to industry poaching, there are an additional three newly

[27] February 14 Report at 6-7, 17-19; June 14 Filing at 2, 13, 22-23.

created PJM Infrastructure Planning positions to be filled throughout 2022. PJM is actively recruiting for these positions. However, the number of individuals available for recruitment in the job marketplace that are trained and able to, on day one, undertake PJM planning work (such as detailed power flow analysis) is a limited universe. To support management of this increased staffing, PJM has also reorganized the interconnection analysis teams and created a new department of interconnection analysis.

Additionally, as mentioned above, based upon the continued cascading detrimental impact to PJM's Facilities Study process and timing, coupled with the work that PJM has been doing with its stakeholders in the IPRTF culminating in the June 14 Filing, PJM reprioritized work in good faith by delaying the Feasibility Studies for AH1 and beyond, and the System Impact Study Reports for AG2, freeing up resources to address the Facilities Study backlogs.

As discussed in the February 14 Report,[28] focusing PJM resources on these older projects and the Facilities Study backlogs has multiple benefits. First and foremost, by clearing the backlogs, PJM is able to provide more accurate and actionable analysis results, as well as better cost certainty, to the newer queued projects. As the older projects receive their Facilities Study Reports and Interconnection Service Agreements ("ISAs"), these projects are required to decide whether to withdraw from the queue or proceed with their ISA. Either way, a level of uncertainty is removed from the process. While some older projects may withdraw upon receipt of their specific project Facilities Study results, in other instances certain reliability criteria violations may no longer exist, thereby eliminating the need for an upgrade or reducing the magnitude of a reliability criteria violation that might have otherwise been reflected in the scope of work for

[28] February 14 Report at 7, 11-12, 16.

subsequent, newer queued projects. Second, as noted below, focusing PJM resources on the Facilities Study backlogs is helping PJM to prepare for its ultimate conversion to the new interconnection process set forth in the June 14 Filing, should the Commission accept such filing on October 3, 2022, as requested.

2. Interconnection Process Reform Task Force/New Interconnection Process

As described in detail in the June 14 Filing and prior PJM informational reports on interconnection study performance metrics, [29] in October 2020, PJM launched a comprehensive set of workshops to explore and collaborate with developers, transmission owners, and other stakeholders improvements to the interconnection process to keep in step with PJM's rapidly growing New Services Queues and evolving grid. These workshops concluded on March 5, 2021, with an issue charge and problem statement giving rise to the IPRTF process.[30]

The IPRTF's overarching goals were to: decrease each project's time in the PJM queue; provide actionable analysis results; and increase customer cost certainty relative to the existing process and any required upgrades. At a high-level, the IPRTF focused on moving PJM from a first-in, first-out serial interconnection process to a first-ready, first-serve cycle/phase interconnection process.

As discussed in greater detail in the June 14 Filing,[31] the IPRTF met 20 times, which occupied approximately 99 hours, and represented significant stakeholder engagement, with 290

[29] June 14 Filing at 2, 13; February 14 Report at 17; August 16 Report at 2-3; February 16 Report at 2-3.

[30] *See* Jack Thomas & Ed Kovler, *IPRTF Participation*, PJM Interconnection, L.L.C. (Apr. 23, 2021), https://www.pjm.com/-/media/committees-groups/task-forces/iprtf/2021/20210423/20210423-item-02-new-group-kick-off-presentation.ashx. Meeting materials for the IPRTF are posted on the PJM website. *See Interconnection Process Reform Task Force*, PJM Interconnection, L.L.C., https://www.pjm.com/committees-and-groups/task-forces/iprtf (last visited August 10, 2022).

[31] June 14 Filing at 26.

PJM Member Companies and 545 total companies participating in the December 2021 polling on the New Rules solution package. Many of the meetings were four to six hours in length. The amount of work by and dedication of PJM and its stakeholders to this process cannot be overstated. While other stakeholder proposals were considered by the IPRTF, non-binding poll results from the IPRTF showed that 93 percent of PJM voting Members supported PJM's transition package proposal[32], and 86 percent of PJM voting Members supported PJM's new interconnection package proposal (which addresses the interconnection process after the transition phase is complete).[33] Following the non-binding poll results, proposed solutions were presented to the PJM Planning Committee ("PC") to address: (1) the transition to the first-ready, first-serve cycle/phase interconnection process ("Transition Process"), and (2) the new interconnection rules applicable to the new process after the transition phase is complete ("New Interconnection Process"). The PC endorsed the New Interconnection Process on January 11, 2022, with 274 Members (approximately 100 percent) voting in favor[34], and endorsed the Transition Process on February 8, 2022, with 218 Members (approximately 91 percent) in favor.[35] The proposed reforms were endorsed on April 27, 2022, by a sector weighted vote of 4.368 by PJM's Markets and Reliability Committee and a sector weighted vote of 4.518 by PJM's Members Committee.[36]

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[32] *See IPRTF Transition Proposals Poll Results*, PJM Interconnection, L.L.C. (Jan. 5, 2022), https://pjm.com/-/media/committees-groups/task-forces/iprtf/2022/20220105/20210105-item-02-transition-proposals-poll-results.ashx.

[33] *See IPRTF New Interconnection Process Proposals Poll Results*, PJM Interconnection, L.L.C. (Dec. 7, 2021), https://www.pjm.com/-/media/committees-groups/task-forces/iprtf/2021/20211207/20211207-item-02-iprtf-interconnection-process-proposals-poll-results.ashx.

[34] Only one Member voted to oppose the process. *See* Planning Committee, *Minutes*, PJM Interconnection, L.L.C. (Jan. 11, 2022), https://pjm.com/-/media/committees-groups/committees/pc/2022/20220111/20220111-minutes.ashx.

[35] *See* Planning Committee, *Minutes*, PJM Interconnection, L.L.C. (Feb. 8, 2022), https://pjm.com/-/media/committees-groups/committees/pc/2022/20220208/20220208-minutes.ashx.

[36] *See* Markets and Reliability Committee, *Minutes*, PJM Interconnection, L.L.C. (Apr. 27, 2022), https://pjm.com/-/media/committees-groups/committees/mrc/2022/20220525/20220525-caa-draft-minutes-mrc-20220427.ashx; *see*

In order to help prepare for a smoother, more expedited changeover to the Transition Process and New Interconnection Process as proposed in the June 14 Filing, starting in the second quarter of 2021, PJM has been focusing more of its internal resources on clearing the Facilities Study backlog of older queue projects. As noted above, this reprioritization of work also improves analysis results and cost certainty for newer queued projects.

3. Legal Service Agreement Team Assistance/shift in work flow

As discussed in PJM's prior informational reports,[37] after engaging in an internal pilot program, the PJM Legal Services Agreement Team ("LSAT") assumed responsibility for the preparation of nearly all of the legal services agreements (e.g., ISAs, Interconnection Construction Service Agreements, etc.) that are to be presented to the Interconnection Customers with either the final System Impact or Facilities Study report. Traditionally, this function was driven by the Interconnection Projects ("IP") team. The PJM LSAT now has lead responsibility in drafting and managing nearly all aspects of the service agreements through and including these agreements being filed with the Commission (or, if conforming, reported in the electronic quarterly report ("EQR")). The PJM LSAT and IP groups have also worked together to develop additional tools to facilitate a more efficient interaction between the two teams and streamline workflow between them. The intent of these collective internal process improvements is to free up the time of the IP

also Members Committee, *Minutes*, PJM Interconnection, L.L.C. (Apr. 27, 2022), https://pjm.com/-/media/committees-groups/committees/mc/2022/20220517-annual/item-07-consent-agenda-a---draft-mc-minutes-04272022.ashx. Following the April 27, 2022 votes by the Markets and Reliability Committee and the Members Committee, two amendments to the approved interconnection reform proposal were presented and passed at the May 17, 2022 Members Committee meeting. *See* Members Committee, *Minutes*, PJM Interconnection, L.L.C. (May 17, 2022), https://pjm.com/-/media/committees-groups/committees/mc/2022/20220629/consent-agenda-a---draft-mc-minutes-05172022.ashx.

[37] *See supra* note 2.

staff, thereby enabling them to spend more time focusing on the New Service Requests as well as managing the study process.

In an effort to further assist the IP team with its workload, the LSAT is now in the process of retaining outside real estate counsel to assist in all required site control reviews - particularly considering the proposed increased site control requirements set forth in the June 14 Filing. At this time, the initial site control review is an IP team responsibility. On average, under the current PJM Tariff site control rules, an IP team member spends up to two hours of review on site control matters for each individual interconnection request. More complicated site control matters can take up to six or eight hours to process for an individual interconnection request. Pursuant to the increased site control rules in the June 14 Filing, the amount of time an IP team member would need to spend reviewing site control during a cycle could triple. Accordingly, PJM envisions transitioning all site control review functions to outside counsel.

D. Personnel Hours Expended Towards Interconnection Studies

While PJM is only required to post this information pursuant to the additional compliance requirements set forth in Tariff, Part IV, Subpart A, section 41.6(b), PJM's aggregate total number of employee hours and third party consultant hours expended towards interconnection studies for the two six-month cycles of 2020, the two six-month cycles of 2021, and the first six-month cycle of 2022 was:[38]

[38] *See supra* note 12.

	2020		2021		2022
	Jan-Jun	**Jul-Dec**	**Jan-Jun**	**Jul-Dec**	**Jan-Jun**
Total hours for PJM staff, contractors, and Transmission Owners[39]	67,219[40]	105,647	101,303	96,802	73,017

The total aggregate number of employee hours and third party consultant hours expended towards interconnection studies for the six-month cycle ending in June 30, 2022, decreased, largely because of the planned work reprioritization, a decrease in new submissions, and reduced Transmission Owner hours. Further, the administrative planning and management of the IPRTF process, including working with PJM internal and outside counsel to draft new and amended Tariff language to implement the interconnection reform process, required PJM personnel hours that otherwise would have been dedicated to queue projects and studies. Additionally, fewer projects were submitted during the AH2 queue that closed in March, compared to 700 in the AH1 queue. This reduced submittal rate, in turn, lowered the number of hours that PJM contractors contributed to internal data reviews, deficiency reviews, and scoping calls. PJM's internal reprioritization of work also led to a decrease in hours from Transmission Owner personnel, who would have typically supported PJM's issuance of AH1 Feasibility and AG2 System Impact Studies.

[39] The numbers in 2020 and 2021 were recently re-submitted by Dominion to remove construction hours, which resulted in a net decrease of the previously reported numbers. The net decrease in the previously reported numbers is between 27,000 and 36,000 hours in each of those respective reporting periods. This error was never included in the reporting of the Jan-Jun 2022 reporting cycle.

[40] Because we do not have actual Transmission Owner revised hours, this number is estimated.

III. COMMUNICATIONS AND CORRESPONDENCE

All notices, communications or correspondences addressed to PJM regarding this matter should be directed to, and PJM requests that the Secretary include on the Commission's official service list, the following:

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IV. SERVICE

PJM has served a copy of this filing on all PJM Members and on the affected state utility regulatory commissions in the PJM Region by posting this filing electronically. In accordance with the Commission's regulations,[41] PJM will post a copy of this filing to the FERC filings section of its internet site, located at the following link: http://www.pjm.com/documents/ferc-manuals/ferc-filings.aspx, with a specific link to the newly-filed document, and will send an e-mail on the same date as this filing to all PJM Members and all state utility regulatory commissions in the PJM Region[42] alerting them that this filing has been made by PJM and is available by following such link. If the document is not immediately available by using the referenced link, the document will be available through the referenced link within twenty-four hours of the filing.

[41] *See* 18 C.F.R. §§ 35.2(e) and 385.2010(f)(3).

[42] PJM already maintains, updates, and regularly uses e-mail lists for all PJM Members and affected state commissions.

V. CONCLUSION

PJM respectfully requests that the Commission accept this required informational filing. PJM will continue to monitor and consider potential solutions to the Facilities Study delays. Pursuant to Tariff, Part IV, Subpart A, section 41.6, PJM will continue submitting these required informational filings within 45 days of the conclusion of each six-month reporting period until such time as PJM is able to provide informational reports on two consecutive six-month reporting periods without any study delays.

Respectfully submitted,
/s/ Jeanine S. Watson

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On behalf of
PJM Interconnection, L.L.C.

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document on those parties on the official Service List compiled by the Secretary in these proceedings.

Dated at Audubon, Pennsylvania this 15th day of August 2022.

/s/ Jeanine S. Watson
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Appendix A – List of Facilities Studies Issued Late

Queue Number	Date Issued	Queue Number	Date Issued
AB1-087	2/4/2022	AE1-077	5/20/2022
AB1-088	2/4/2022	AE1-079	1/7/2022
AC1-033	5/26/2022	AE1-153	3/1/2022
AC1-053	4/21/2022	AE1-155	2/23/2022
AC1-101	3/18/2022	AE1-179	3/2/2022
AC1-102	3/18/2022	AE1-212	2/15/2022
AC1-167	3/24/2022	AE1-229	2/3/2022
AC1-171	4/21/2022	AE1-237	2/8/2022
AC1-190	5/5/2022	AE1-240	3/10/2022
AC2-023	1/10/2022	AE1-243	2/4/2022
AC2-060	2/11/2022	AE2-030	3/2/2022
AC2-061	3/28/2022	AE2-046	1/12/2022
AC2-090	5/6/2022	AE2-104	5/23/2022
AC2-154	3/7/2022	AE2-118	5/19/2022
AD1-025	6/24/2022	AE2-121	3/23/2022
AD1-043	5/6/2022	AE2-182	6/3/2022
AD1-070	2/16/2022	AE2-217	1/6/2022
AD1-073	2/11/2022	AE2-224	3/30/2022
AD1-087	1/10/2022	AE2-230	6/1/2022
AD1-088	6/3/2022	AE2-256	5/9/2022
AD1-106	3/25/2022	AE2-277	1/24/2022
AD1-128	3/21/2022	AE2-315	3/21/2022
AD1-152	4/20/2022	AE2-318	2/17/2022
AD2-014	4/5/2022	AE2-333	4/8/2022
AD2-060	3/7/2022	AE2-334	4/4/2022
AD2-062	6/2/2022	AF1-042	2/3/2022
AD2-074	2/3/2022	AF1-045	2/17/2022
AD2-202	1/10/2022	AF1-291A	6/1/2022
AE1-020	3/25/2022	AF2-075	6/1/2022
AE1-062	1/18/2022		

Appendix B – List of Delayed Facilities Studies

Queue Number	Queue Number	Queue Number	Queue Number	Queue Number	Queue Number
AC1-008	AD2-071	AE1-146	AE2-045	AE2-160	AE2-260
AC1-168	AD2-075	AE1-148	AE2-047	AE2-166	AE2-262
AC1-188	AD2-077	AE1-149	AE2-048	AE2-169	AE2-263
AC1-194	AD2-086	AE1-157	AE2-051	AE2-172	AE2-264
AC2-015	AD2-091	AE1-158	AE2-052	AE2-173	AE2-267
AC2-017	AD2-092	AE1-161	AE2-053	AE2-175	AE2-270
AC2-029	AD2-096	AE1-163	AE2-060	AE2-176	AE2-271
AC2-044	AD2-134	AE1-170	AE2-071	AE2-181	AE2-275
AC2-048	AD2-136	AE1-172	AE2-072	AE2-183	AE2-276
AC2-157	AD2-157	AE1-173	AE2-073	AE2-185	AE2-280
AD1-013	AD2-162	AE1-181	AE2-084	AE2-187	AE2-281
AD1-022	AD2-178	AE1-190	AE2-089	AE2-190	AE2-282
AD1-056	AD2-179	AE1-191	AE2-092	AE2-194	AE2-283
AD1-057	AD2-214	AE1-206	AE2-093	AE2-195	AE2-289
AD1-074	AE1-001	AE1-207	AE2-094	AE2-204	AE2-291
AD1-075	AE1-051	AE1-208	AE2-107	AE2-210	AE2-292
AD1-076	AE1-053	AE1-209	AE2-110	AE2-212	AE2-295
AD1-100	AE1-056	AE1-210	AE2-111	AE2-214	AE2-298
AD1-102	AE1-058	AE1-225	AE2-113	AE2-216	AE2-299
AD1-103	AE1-059	AE1-227	AE2-117	AE2-219	AE2-302
AD1-116	AE1-064	AE1-238	AE2-120	AE2-220	AE2-305
AD1-133	AE1-068	AE1-245	AE2-122	AE2-222	AE2-306
AD1-151	AE1-069	AE1-246	AE2-123	AE2-223	AE2-308
AD1-161	AE1-072	AE1-250	AE2-124	AE2-226	AE2-313
AD2-007	AE1-085	AE2-001	AE2-130	AE2-231	AE2-316
AD2-008	AE1-090	AE2-019	AE2-133	AE2-234	AE2-320
AD2-020	AE1-091	AE2-020	AE2-136	AE2-236	AE2-321
AD2-022	AE1-092	AE2-021	AE2-137	AE2-237	AE2-322
AD2-023	AE1-093	AE2-022	AE2-138	AE2-241	AE2-323
AD2-031	AE1-102	AE2-024	AE2-140	AE2-247	AE2-325
AD2-033	AE1-103	AE2-025	AE2-147	AE2-248	AE2-326
AD2-038	AE1-105	AE2-027	AE2-148	AE2-250	AE2-339
AD2-046	AE1-107	AE2-033	AE2-149	AE2-251	AE2-344
AD2-051	AE1-108	AE2-034	AE2-150	AE2-255	AE2-345
AD2-063	AE1-113	AE2-038	AE2-153	AE2-257	AF1-007
AD2-066	AE1-117	AE2-041	AE2-154	AE2-258	AF1-012
AD2-067	AE1-144	AE2-044	AE2-156	AE2-259	AF1-015

Queue Number	Queue Number	Queue Number	Queue Number	Queue Number	Queue Number
AF1-017	AF1-096	AF1-170	AF1-272	AF2-048	AF2-351
AF1-018	AF1-098	AF1-173	AF1-275	AF2-056	AF2-352
AF1-019	AF1-103	AF1-176	AF1-279	AF2-059	AF2-361
AF1-028	AF1-104	AF1-201	AF1-280	AF2-066	AF2-365
AF1-029	AF1-105	AF1-202	AF1-281	AF2-067	AF2-376
AF1-030	AF1-106	AF1-203	AF1-282	AF2-079	AF2-377
AF1-038	AF1-108	AF1-204	AF1-283	AF2-082	AF2-384
AF1-040	AF1-109	AF1-205	AF1-285	AF2-084	AF2-403
AF1-046	AF1-112	AF1-206	AF1-286	AF2-086	AF2-416
AF1-047	AF1-113	AF1-207	AF1-290	AF2-090	AF2-417
AF1-048	AF1-114	AF1-208	AF1-292	AF2-102	AF2-418
AF1-049	AF1-116	AF1-211	AF1-293	AF2-110	AF2-421
AF1-050	AF1-117	AF1-212	AF1-294	AF2-114	AF2-424
AF1-051	AF1-118	AF1-215	AF1-301	AF2-127	AF2-425
AF1-053	AF1-119	AF1-216	AF1-302	AF2-136	AF2-433
AF1-054	AF1-120	AF1-221	AF1-304	AF2-140	AF2-434
AF1-059	AF1-122	AF1-222	AF1-311	AF2-152	AF2-438
AF1-060	AF1-123	AF1-223	AF1-319	AF2-153	AF2-440
AF1-062	AF1-124	AF1-225	AF1-320	AF2-154	AF2-444
AF1-063	AF1-125	AF1-226	AF1-321	AF2-155	AF2-445A
AF1-064	AF1-127	AF1-227	AF1-322	AF2-156	AG1-025
AF1-066	AF1-128	AF1-228	AF1-323	AF2-157	AG1-094
AF1-067	AF1-129	AF1-229	AF1-325	AF2-158	AG1-097
AF1-069	AF1-130	AF1-231	AF1-328	AF2-159	AG1-114
AF1-071	AF1-134	AF1-233	AF1-330	AF2-163	AG1-159
AF1-072	AF1-136	AF1-237	AF1-331	AF2-175	AG1-280
AF1-075	AF1-141	AF1-238	AF1-333	AF2-192	AG1-281
AF1-076	AF1-143	AF1-239	AF1-334	AF2-227	AG1-510
AF1-077	AF1-144	AF1-240	AF1-336	AF2-229	
AF1-078	AF1-146	AF1-245	AF1-337	AF2-232	
AF1-079	AF1-148	AF1-246	AF1-338	AF2-233	
AF1-082	AF1-152	AF1-251	AF1-339	AF2-234	
AF1-083	AF1-153	AF1-252	AF2-004	AF2-254	
AF1-084	AF1-156	AF1-253	AF2-005	AF2-260	
AF1-085	AF1-158	AF1-254	AF2-027	AF2-263	
AF1-086	AF1-159	AF1-256	AF2-028	AF2-294	
AF1-090	AF1-161	AF1-265	AF2-029	AF2-298	
AF1-091	AF1-162	AF1-266	AF2-030	AF2-306	
AF1-092	AF1-164	AF1-268	AF2-031	AF2-308	
AF1-093	AF1-165	AF1-270	AF2-032	AF2-309	
AF1-094	AF1-167	AF1-271A	AF2-034	AF2-350	