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**JOINT APPLICANTS, MID-ATLANTIC INTERSTATE TRANSMISSION, LLC,
METROPOLITAN EDISON COMPANY AND
PENNSYLVANIA ELECTRIC COMPANY
SUPPLEMENTAL DIRECT TESTIMONY AND EXHIBITS**

STATEMENT NO. 1S - Charles V. Fullem

EXHIBIT CVF-2

STATEMENT NO. 2S - Jeffrey J. Mackauer

STATEMENT NO. 3S - Steven R. Staub

STATEMENT NO. 4S - K. Jon Taylor

EXHIBIT KJT-9

EXHIBIT KJT-10

2/29/14

1165 Jan

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

JOINT APPLICATION OF MID-ATLANTIC INTERSTATE TRANSMISSION, LLC ("MAIT"); METROPOLITAN EDISON COMPANY ("MET-ED") AND PENNSYLVANIA ELECTRIC COMPANY ("PENELEC") FOR: (1) A CERTIFICATE OF PUBLIC CONVENIENCE UNDER 66 PA.C.S. § 1102(A)(3) AUTHORIZING THE TRANSFER OF CERTAIN TRANSMISSION ASSETS FROM MET-ED AND PENELEC TO MAIT; (2) A CERTIFICATE OF PUBLIC CONVENIENCE CONFERRING UPON MAIT THE STATUS OF A PENNSYLVANIA PUBLIC UTILITY UNDER 66 PA.C.S. § 102; AND (3) APPROVAL OF CERTAIN AFFILIATE INTEREST AGREEMENTS UNDER 66 PA.C.S. § 2102

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**Supplemental Direct Testimony
of
Charles V. Fullem**

List of Topics Addressed

Responding to Questions Set Forth in the Secretarial Letter Issued on August 10, 2015

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**SUPPLEMENTAL DIRECT TESTIMONY
OF
CHARLES V. FULLEM**

1 **I. INTRODUCTION AND PURPOSE**

2 **Q. Please state your name and business address.**

3 A. My name is Charles V. Fullem, and my business address is 2800 Pottsville Pike, Reading,
4 Pennsylvania 19605.

5 **Q. Have you previously presented testimony in this proceeding?**

6 A. Yes, on June 19, 2015, my direct testimony, Joint Applicants' Statement No. 1 and the
7 accompanying Exhibit CVF-1, were filed in this matter. My background and
8 qualifications are fully set forth in that statement.

9 **Q. What is the purpose of your supplemental direct testimony?**

10 A. On June 19, 2015, Mid-Atlantic Interstate Transmission, LLC ("MAIT"), Metropolitan
11 Edison Company ("Met-Ed") and Pennsylvania Electric Company ("Penelec")
12 (collectively, the "Joint Applicants") filed a Joint Application requesting that the
13 Pennsylvania Public Utility Commission ("PUC" or the "Commission") authorize the
14 transfer of certain transmission assets from Met-Ed and Penelec (each a "Company" and
15 collectively the "Companies") to MAIT, grant MAIT a certificate of public convenience
16 conferring upon it the status of a Pennsylvania public utility and approve certain affiliated
17 interest agreements. In support of their Joint Application, the Joint Applicants submitted
18 my direct testimony as well as the direct testimony of Jeffrey J. Mackauer (Joint
19 Applicants' Statement No. 2), Steven R. Staub (Joint Applicants' Statement No. 3) and

1 K. Jon Taylor (Joint Applicants' Statement No. 4).

2 On August 10, 2015, the Commission issued a Secretarial Letter in which it set forth
3 thirty-eight questions, divided into eight subject areas (Parts A-H), that it requested the
4 parties to this proceeding to address on the record "in testimonial form (direct,
5 supplemental direct, rebuttal) or as exhibits" (Secretarial Letter, p. 2). My supplemental
6 direct testimony responds to the following questions in the Commission's Secretarial
7 Letter:

8	Part A	Question	No.	4
9	Part B	Question	No.	1
	Part C	Question	Nos.	1-3
	Part D	Question	Nos.	1-2
10	Part E	Question	Nos.	9, 10 and 12
	Part F	Question	No.	2
	Part G	Question	Nos.	1, 2 and 4

11 Additionally, on October 1, 2015, the Commission issued a second Secretarial Letter
12 directing, among other things, that the Joint Applicants submit for the evidentiary record
13 the study prepared by Navigant Consulting, Inc. ("Navigant") that is discussed in my
14 direct testimony (Joint Applicants' Statement No. 1, pp. 15-16). In compliance with the
15 Commission's request, I am submitting the Navigant Seven Factor Analysis as Joint
16 Applicants' Exhibit CVF-2, which accompanies my supplemental direct testimony. The
17 October 1, 2015, Secretarial Letter also directs that a list of transmission facilities to be
18 transferred to MAIT should be put in the record. That information is being submitted in
19 Joint Applicants' Exhibit KJT-9, which is sponsored by Mr. Taylor. Finally, the second
20 Secretarial Letter asks the parties to independently examine the methodology and
21 conclusions of the Navigant study with regard to the application of the Federal Energy
22 Regulatory Commission's ("FERC") "seven factor test" for distinguishing transmission
23

1 and distribution facilities. Navigant’s methodology is discussed in its Seven Factor
2 Analysis and is, therefore, available for other parties to analyze.

3 **II. RESPONSES TO THE COMMISSION’S DIRECTED QUESTIONS**

4 **Q. Please respond to Part A, Question No. 4, which provides:**

5 **What will be the effect of the proposed transaction on**
6 **customers that receive service at sub-transmission and**
7 **transmission voltages?**

8 A. There will be no change in the rates, terms or conditions of service for customers of Met-
9 Ed and Penelec receiving service at sub-transmission and transmission voltages, as set
10 forth in the tariffs of those Companies on file with the Commission and as set forth in the
11 rates, terms, or conditions of service set forth in their respective portions of the PJM
12 Interconnection LLC’s (“PJM”) Open Access Transmission Tariff (“OATT”) as a result
3 of the proposed transaction.

14 **Q. Please respond to Part B, Question No. 1, which provides:**

15 **How will this transaction impact the competitiveness of**
16 **transmission service in the Commonwealth and the ability of**
17 **the PAPUC to monitor and investigate anti-competitive**
18 **behavior?**

19 A. PJM has been authorized by the FERC as the Regional Transmission Organization
20 (“RTO”) responsible for managing a regional transmission grid encompassing all or parts
21 of thirteen states and the District of Columbia, including the control areas of Met-Ed and
22 Penelec. PJM has operational control over the Companies’ transmission facilities and
23 provides electric transmission service to Load Serving Entities (“LSEs”) at rates and
24 under terms and conditions of service set forth in its OATT, which is filed with, and
5 approved by, the FERC.

1 Upon the completion of the proposed transaction, Met-Ed and Penelec will no longer own
2 any facilities serving a transmission function. All transmission services over the
3 transmission facilities transferred to MAIT will be provided on a non-discriminatory
4 basis pursuant to the terms of PJM's OATT, in the same manner those services are
5 currently furnished by Met-Ed and Penelec. The transmission facilities will remain
6 subject to the terms of PJM's OATT before, during and after the proposed transaction.
7 Rates for transmission service will remain subject to the jurisdiction of the FERC and be
8 administered by PJM through the OATT. The Operating Companies will continue to
9 own and operate all distribution facilities they presently own and will continue to provide
10 retail electric service within their existing service territories as they do today.

11 Additionally, if the Commission grants MAIT's request for a certificate of public
12 convenience, MAIT will have the status of a Pennsylvania public utility and, as such, the
13 Commission will have the same authority to investigate alleged anti-competitive behavior
14 with respect to its provision of transmission service that it has with respect to the
15 transmission service currently furnished by the Companies. Consequently, the proposed
16 transaction will not diminish the Commission's ability as it exists today to monitor and
17 investigate anti-competitive behavior.

18 **Q. Please respond to Part C, Question No. 1, which provides:**

19 **The PAPUC currently exercises oversight of outage incidents**
20 **by jurisdictional public utilities when outage events occur even**
21 **if the cause of the outage occurred on transmission facilities.**
22 **Does MAIT seek exemption from our jurisdiction over safety,**
23 **adequacy, and reliability of electric service under Chapter 15**
24 **of the Public Utility Code and 52 Pa. Code §§ 57.191 et seq.?**
25 **Should such an exemption be made for MAIT?**

26 A. MAIT is not requesting any exemption from the jurisdiction the Commission may

1 lawfully exercise over the safety, adequacy, and reliability of electric service under
2 Chapter 15 of the Public Utility Code and 52 Pa. Code §§ 57.191 et seq. Consequently,
3 the question of whether any such “exemption” should be made does not arise here.

4 **Q. Please respond to Part C, Question No. 2, which provides:**

5 **In paragraph 24 of the Application, MAIT states that it may**
6 **petition the Commission to be relieved of certain requirements**
7 **pertaining to its provision of interstate transmission service.**
8 **List with specificity all requirements for which MAIT may**
9 **seek exemptions and the reasons for seeking such exemptions.**

10 **A. Paragraph 24 of the Joint Application states as follows:**

11 MAIT acknowledges that, as the holder of a certificate of public
12 convenience, it will be required to comply with the Public Utility
13 Code and the Commission’s regulations and orders, excluding
14 those provisions that expressly or by reasonable implication apply
15 only to a public utility that furnishes intrastate service within
16 Pennsylvania or that are preempted by the FERC’s exclusive
17 jurisdiction over transmission service and rates. Additionally,
18 MAIT reserves the right to hereafter petition the Commission to be
19 relieved of requirements that, given MAIT’s provision of only
20 interstate transmission service subject to the exclusive jurisdiction
21 of the FERC, would not serve a reasonable regulatory purpose to
22 impose on MAIT.

23 MAIT has not identified any such requirements at this time. If it had, it would have
24 requested relief from those requirements in the Joint Application. For that reason, MAIT
25 reserved the right to ask the Commission in the future to be relieved of those types of
26 requirements if and when it is determined that they might apply and that the criteria for
27 seeking relief explained in Paragraph 24 are present.

28 **Q. Please respond to Part C, Question No. 3, which provides:**

29 **In the same paragraph, MAIT refers generally to Pennsylvania**
30 **laws and Commission orders that would not apply to it on**
31 **account of its provision of interstate electric service. List with**

1 **specificity the laws and Commission orders that MAIT does**
2 **not believe apply to it.**

3 A. Paragraph 24 was set forth in the answer to the preceding question. Every one of the
4 specific provisions of the Public Utility Code and the Commission’s regulations that
5 “expressly or by reasonable implication apply only to a public utility that furnishes
6 intrastate service within Pennsylvania or that are preempted by the FERC’s exclusive
7 jurisdiction over transmission service and rates” has not been identified by the Joint
8 Applicants at this time. It is my understanding that the legislature has recognized that
9 provisions of the Public Utility Code and the Commission’s exercise of authority under
10 the Public Utility Code may be preempted by Federal law (either currently or in the
11 future), as reflected in sections of the Public Utility Code that address such possibilities,
12 namely, 66 Pa.C.S. § 104 and 314. Joint Applicants and their counsel believe that,
13 applying the criteria for making such determinations under the circumstances described
14 in the first sentence of Paragraph 24 would, at a minimum, entail any statutory or
15 regulatory requirements that apply only to a Pennsylvania public utility that owns or
16 operates facilities for the distribution of electricity to retail customers in the
17 Commonwealth. This determination was based upon, among other factors, the definition
18 of “electric distribution company” in 66 Pa.C.S. § 2803. While not an exclusive list of all
19 statutory and regulatory provisions that are within the exclusion identified in the first
20 sentence of Paragraph 24 of the Joint Application, the Joint Applicants believe that the
21 applicable criteria would encompass the following:

22 **Title 66 of Pennsylvania Consolidated Statutes:**

- 23 Section 510
24 Chapter 13
25 Chapter 14
26

1 Section 1703
2 Chapter 28

3
4 **Title 52 of the Pennsylvania Code:**

5
6 Chapter 54
7 Chapter 56
8 Chapter 58
9 Chapter 71
10 Chapter 73
11 Chapter 75
12 Chapter 111
13 Chapter 121

14 **Q. Please respond to Part D, Question No. 1, which provides:**

15 **MAIT will lease the property associated with the transferred**
16 **transmission assets from the operating companies. Will there**
17 **be any shared property by MAIT and the operating**
18 **company? If so, how will the lease allocation formula operate**
19 **for allocation of costs between facilities that are utilized for**
20 **both transmission and distribution functions?**

1 A. Met-Ed and Penelec currently have, and may in the future construct, distribution lines
22 suspended from structures that were built for transmission lines. Consequently, those
23 structures and the right-of-way on which they were constructed are transmission
24 facilities. As explained in K. Jon Taylor's direct testimony (Joint Applicants' Statement
25 No. 4), Met-Ed and Penelec will own the land on which the transferred transmission
26 assets are located and will lease it to MAIT under the proposed Ground Leases. Under
27 Article 8 of their Ground Leases, Met-Ed and Penelec reserve the right to occupy the
28 leased rights-of-way for compatible uses, including locating their distribution lines on
29 such rights-of-way, subject to the conditions set forth in Article 8 and additional terms set
30 forth in Article 7 of the Ground Leases. The rent payable by MAIT to Met-Ed and
31 Penelec under the Ground Lease will not be reduced for any use or assumed use of the
? transmission rights-of-way for distribution purposes because the primary use of the

1 rights-of-way is and will continue to be for transmission facilities.

2 **Q. Please respond to Part D, Question No. 2, which provides:**

3 **Will MAIT or the operating company apply for and own new**
4 **or expanded rights of way? Which party will own the existing**
5 **rights of way? Who will be the applicant in transmission line**
6 **siting applications? If eminent domain authority is required,**
7 **will MAIT or the operating company apply for that authority?**

8 A. MAIT will own any new rights-of way. MAIT will also own expanded rights-of-way.
9 However, there may be instances where both MAIT and one of the Companies will own
10 the expanded rights-of-way depending on specific factual circumstances. Existing rights-
11 of-way will continue to be owned by Met-Ed and Penelec. MAIT will be the applicant
12 for siting authority for transmission lines with voltage above 100 kV that will be built and
13 owned by MAIT and will also be the applicant requesting eminent domain authority from
14 the PUC for rights-of-way or other interests in land needed to construct facilities in
15 Pennsylvania. However, there may be instances in which both MAIT and either or both
16 of Met-Ed and Penelec would join in filing transmission line siting applications and/or
17 eminent domain applications based on specific factual circumstances.

18 **Q. What subject is addressed by the questions in Part E of the Secretarial Letter?**

19 A. Part E is titled "Financing Arrangements," and the Commission provided the following
20 introduction to the questions it posed in that part:

21 The operating companies will make a one-time contribution of
22 their existing transmission assets to MAIT through a tax-free
23 transfer in exchange for Class B membership interest. The
24 operating companies will have a 95% class B ownership interest in
25 MAIT with no operational or managerial control authority except
26 for limited "special rights." FE Transmission LLC (FET) will
' make a cash contribution to MAIT in return for a 5% Class A
28 membership interest conferring ownership and control of MAIT.

1 The FE operating companies will participate in the investment in
2 MAIT in the following percentages: JCP&L (54.8%); Met-Ed
3 (17%); Penelec (23%). The parties should address the following
4 issues to the extent relevant to their respective positions: . .

5 **Q. Please respond to Part E, Question No. 9, which provides:**

6 **At what point will the rate base impacts of this transaction**
7 **(such as transfer of transmission assets, goodwill, ADIT and**
8 **receipt of lease payments) be reflected in retail rates of the PA**
9 **operating companies?**

10 A. In the electric distribution base rate cases filed by Met-Ed (Docket No. R-2014-2428745)
11 and Penelec (Docket No. R-2014-2428743), the Companies excluded from the
12 determination of their Pennsylvania jurisdictional rate bases all transmission-related
13 assets, including transmission plant in service and allocable portions of transmission-
14 related common, general and intangible plant, as well as transmission related
15 accumulated deferred income taxes (“ADIT”). Goodwill is not recognized as an asset in
16 rate base for ratemaking purposes in Pennsylvania and, therefore, no goodwill related to
17 either the Companies’ distribution or transmission functions was included in their rate
18 bases in their 2014 cases. Additionally, transmission-related operating expenses were
19 excluded from the Companies’ operating and maintenance expenses in developing their
20 claimed revenue requirements in those cases. Transmission revenues were excluded from
21 the pro forma intrastate distribution revenues in developing the Companies’ revenues at
22 present and proposed rates and in developing their proposed and final Pennsylvania
23 electric distribution rates and proofs of revenues.¹

24 As I noted in my direct testimony at page 16, those assets will no longer be considered
25 transmission assets and will be reflected in base distribution rates in the Companies’ first

¹ The Companies’ base rate cases were concluded by settlements that were approved by the Commission in its Final Orders entered at the above-referenced dockets on April 9, 2015.

1 distribution base rate case following the completion of the transaction.

2 **Q. Please respond to Part E, Question No. 10, which provides:**

3 **Will MAIT track savings associated with formation of MAIT?**
4 **If yes, how will the costs of MAIT transactions be tracked?**

5 A. MAIT is not planning to track savings associated with formation of MAIT.

6 **Q. Please respond to Part E, Question No. 12, which provides:**

7 **At what point will the PJM transmission payments currently**
8 **made to Met-Ed and Penelec for Network Integrated**
9 **Transmission Service (NITS) shift to MAIT?**

10 A. The proposed transaction will close once all the required regulatory approvals have been
11 obtained. MAIT, as the owner of the transmission assets, will then be entitled to receive
12 all related transmission revenue from providing Network Integrated Transmission Service
13 (“NITS”). Met-Ed and Penelec will, after the closing of this transaction, be entitled to
14 receive their pro rata shares of dividends declared by MAIT and ground lease payments.

15 **Q. What subject is addressed by the questions in Part F of the Secretarial Letter?**

16 A. Part F is titled “Energizing the Future Program (EtF) and Reliability Enhancement (RE),”
17 and the Commission provided the following introduction to the questions posed in that
18 part:

19 FE indicates in its testimony (in considerable detail) that it is
20 proposing the EtF and RE process to substantially upgrade and
21 improve its transmission system in the service territories of the
22 operating companies. These investments are expected to cost \$2.5-
23 3.0 billion over the next 5-10 years, which is a substantial
24 investment. The parties should address the following issues with
25 regard to the EtF/RE program: . . .

26 **Q. Please respond to Part F, Question No. 2, which provides:**

1 **To what extent will the various categories of EtF/RE projects**
2 **described in Mr. Taylor's testimony require increased expense**
3 **to the FE operating companies at the distribution level?**
4 **Provide a projection, based on current information, of the**
5 **expense level to PA operating companies.**

6 A. All of the capital costs and operating and maintenance expenses of the various categories
7 of projects in the EtF and RE process described in Mr. Taylor's direct testimony will be
8 borne by MAIT, which will build and own those transmission facilities after the proposed
9 transaction is consummated. The revenue requirement associated with those projects will
10 be reflected in the rates charged by PJM, as the transmission provider, to all transmission
11 customers receiving service from those facilities, pursuant to the applicable terms of
12 PJM's OATT, when such facilities are reflected in MAIT's FERC-approved rates
13 included in the PJM OATT. It is possible that certain EtF/RE projects that interconnect
14 with the distribution facilities of the Companies may require Met-Ed and Penelec to make
15 some modifications to their distribution facilities. If that occurs, the cost of the
16 modifications made to the Companies' distribution facilities will be incurred by the
17 Companies and will be reflected in their future distribution rates.

18 **Q. Please respond to Part G, Question No. 1, which provides:**

19 **Will there be any impact on zonal rates for the operating**
20 **companies from approval of this transaction? For example,**
21 **does FE propose to have one NITS rate applicable for all three**
22 **operating companies or will FE propose separate NITS rates**
23 **for each operating company service area?**

24 A. The approval of the proposed transaction will have no impact on zonal rates for the
25 Companies. Since 1996, Met-Ed, Penelec and Jersey Central Power & Light Company
26 ("JCP&L") have had a unified rate (i.e., the same rate) for NITS that applies across all
7 three zones, as the FERC had required. MAIT expects to have one NITS rate across all

1 three zones after the proposed transaction is consummated.

2 **Q. Please respond to Part G, Question No. 2, which provides:**

3 **What will be the rate impact to NITS as a result of shifting**
4 **from a stated rate to a formula rate, assuming no change in**
5 **the current in-service transmission assets in order to isolate**
6 **both the impact of this ownership and rate mechanism change**
7 **on ratepayers?**

8 A. If the Companies were to make such a rate filing, and assuming the same test year and no
9 change in the in-service transmission assets and related operating expenses, their NITS
10 rates would be the same under stated rates as they would be under formula rates.

11 **Q. Please respond to Part G, Question No. 4, which provides:**

12 **What impact, if any, does this transaction and rate**
13 **mechanism have on the treatment of state and federal taxes as**
14 **it relates to NITS rates?**

15 A. The proposed transaction and the adoption of a formula rate will have no impact on the
16 treatment of state and federal income taxes associated with NITS rates.

1 **III. CONCLUSION**

2 **Q. Does this conclude your supplemental direct testimony?**

3 **A. Yes, it does.**

4

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FirstEnergy Seven-Factor Analysis

Prepared for:
Pennsylvania Electric Company, Metropolitan Edison
Company, and Jersey Central Power & Light Company



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Introduction

The Federal Energy Regulatory Commission (“FERC”) and state public utility commissions rely on a multi-factor test, known as the “seven factor test,” to distinguish between “transmission” facilities, which are subject to FERC’s exclusive jurisdiction,¹ and “local distribution” facilities, which are subject to state jurisdiction. The seven factors are used to identify the “primary function of a facility.”² If the primary function is transmission, the facility is subject to FERC’s exclusive jurisdiction; if the primary function is distribution, the facility is under state jurisdiction. FERC first articulated the test in Order No. 888, as follows:

1. local distribution facilities are normally in close proximity to retail customers
2. local distribution facilities are primarily radial in character
3. power flows into local distribution systems; it rarely, if ever, flows out
4. when power enters a local distribution system, it is not re-consigned or transported on to some other market
5. power entering a local distribution system is consumed in a comparatively restricted geographic area
6. meters are based at the transmission/local distribution interface to measure flow into the local distribution system; and
7. local distribution systems will be of reduced voltage.³

FERC makes assessments under the seven-factor test on a case-by-case basis, applying “totality of the circumstances” principles.⁴ How a facility is classified under one part of the test is not determinative where other factors indicate that the “primary function” of the facility is the opposite.⁵

Where unbundled retail wheeling occurs because of a state retail access program, FERC’s policy is to defer to state recommendations as to where to draw the jurisdictional line, provided that the state’s recommendations are based on the seven factor test.⁶ FERC expects states to “specifically evaluate the seven indicators and any other relevant facts and to make recommendations consistent with the essential

¹ 16 U.S.C. § 824(b)(1) (granting FERC exclusive jurisdiction over the “transmission of electric energy in interstate commerce” and “sale of electric energy at wholesale in interstate commerce”).

² *Cal. Pac. Elec. Co., LLC*, 133 FERC ¶ 61,018 at P 45 (2010) (“[E]ven when a distribution facility is used to facilitate a jurisdictional wholesale sale . . . if the primary function of the facility is local distribution, only the use of the facility for the [FERC]-jurisdictional services will be subject to [FERC’s] jurisdiction.”).

³ *Promoting Wholesale Competition Through Open-Access Non-Discriminatory Transmission Serv. by Pub. Utils. & Recovery of Stranded Costs by Pub. Utils. & Transmitting Utils.*, Order No. 888, FERC Stats. & Regs., Regulations Preambles January 1991 - June 1996 ¶ 31,036, 31,771, 31,981 (1996).

⁴ *Cal. Pac. Elec. Co., LLC*, 133 FERC ¶ 61,018 at PP 45, 48.

⁵ *Id.* at P 48.

⁶ *Order No. 888* at 31,784 & n.548.

elements of Order No. 888.”⁷ “Other relevant facts” could include, for example, “technical factors that the state believes are appropriate in light of historical uses of particular facilities.”⁸

Navigant Consulting (“Navigant”) was engaged to review the existing classifications of transmission and distribution facilities owned by three FirstEnergy subsidiary utilities - Pennsylvania Electric Co. (“Penelec”), Metropolitan Edison Co. (“Met-Ed”), and Jersey Central Power & Light Co. (“JCP&L”), collectively for this report to be known as the “three FirstEnergy Subsidiary Utilities.” Navigant was also engaged to perform an independent analysis of whether, under each of the seven factors set forth in Order No. 888, the facilities are indicative of local distribution or transmission. In this Technical Report, we determined the primary function of each voltage class. Table 3 - Percentage of Lines that Operate in Radial vs Networked Fashion, summarizes the results of our analysis under each of the seven factors, and Table 9 - Final Determination of Asset Classification Indicators, provides our independent opinion as to the proper classification of each voltage class.

⁷ *Id.*

⁸ *Id.*

Executive Summary***System Description***

The three FirstEnergy Subsidiary Utilities' customer counts for 2014 are summarized in Table ES-1 - Customer Counts. The voltage levels and pole miles for each utility's existing transmission and local distribution facilities are summarized in Table ES-2 - Voltage Levels and Pole Miles. As Table ES-2 shows, the three FirstEnergy Subsidiary Utilities own and operate electric transmission and local distribution facilities within their service areas at 500 kV, 345 kV, 230 kV, 138 kV, 115 kV, 69 kV, 46 kV, 34.5 kV, 19.9 kV, and other lower voltages. Throughout this Technical Report, the term less than 34.5 kV refers to the lines that are 19.9/34.5 kV wye and lower in voltage.

Table ES-1 - Customer Counts

Operating Company	Customer Count (2014)
Penelec	588,000
Met-Ed	558,000
JCP&L	1,103,000

Table ES-2 - Voltage Levels and Pole Miles

Voltage Level	Operating Company		
	Penelec (Miles)	Met-Ed (Miles)	JCP&L (Miles)
500 kV	380	203	18
345 kV	107	NA	NA
230 kV	640	399	472
138 kV	11	3	NA
115 kV	1375	367	192
69 kV	NA	434	NA
46 kV	364	NA	NA
34.5 kV	106	35 *	1503
19.9/34.5 kV wye	6530	1477	264
13.2/23 kV wye	2032	NA	NA
7.62/13.2 kV wye	NA	8330	NA
7.2/12.5 kV wye	6671	NA	8804
12.0 kV delta	11	NA	NA
4.8/8.32 kV wye	167	NA	NA
7.2 kV delta	127	NA	NA
2.4/4.8 kV delta	9	NA	NA
4.8 kV delta	581	1450	1593
2.4/4.16 kV wye	619	NA	1028

* Limited amount of 34.5 kV located in the Glendon(Met-Ed) to Gilbert(JCP&L) areas which is no longer networked. These lines are currently classified as transmission

Existing and Proposed Classifications

Each of the three FirstEnergy Subsidiary Utilities currently classifies all of its facilities with voltage levels at or above 46 kV as transmission facilities.⁹ In addition, all the 34.5 kV facilities in JCP&L and a small amount of 34.5 kV facilities in Met-Ed are also classified as transmission facilities. All other facilities are classified as distribution facilities.¹⁰ Based on our findings under the seven factor test, Navigant does not recommend any changes to the existing transmission and distribution classifications with the exception of moving 6 of the 56 Met-Ed 34.5 kV facilities from transmission to distribution since our analysis determined they are not operated as a transmission network and are serving a distribution function. The remaining 50 Met-Ed 34.5 kV facilities are classified as distribution. Table ES-3 - Seven Factor Test Summary Findings, summarizes the results for the seven factor test, for each of the three FirstEnergy Subsidiary Utilities, by voltage level.

Table ES-3 - Seven Factor Test Summary Findings

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Penelec							
500 kV	T	T	T	T	T	T	T
345 kV	T	T	T	T	T	T	T
230 kV	T	T	T	T	T	T	T
138 kV	T	T	T	T	T	T	T
115 kV	T	T	T	T	T	T	T
46 kV	T	T	T	D	T	T	T
34.5 kV	T	D	D	D	D	D	D
<= 34.5 kV	D	D	D	D	D	D	D
Met-Ed							
500 kV	T	T	T	T	T	T	T
230 kV	T	T	T	T	T	T	T
138 kV	T	T	T	T	T	T	T
115 kV	T	T	T	T	T	T	T
69 kV	T	T	T	T	T	T	T
34.5 kV	T	D	D	D	D	D	D
<= 34.5 kV	D	D	D	D	D	D	D
JCP&L							
500 kV	T	T	T	T	T	T	T
230 kV	T	T	T	T	T	T	T
115 kV	T	T	T	T	T	T	T
34.5 kV	T	T	T	T	T	T	T
< 34.5 kV	D	D	D	D	D	D	D

⁹ PJM Interconnection, L.L.C. has functional control of the three FirstEnergy Subsidiary Utilities' transmission facilities and operates these transmission facilities under the terms of the PJM Open Access Transmission Tariff.

¹⁰ Penelec and Met-Ed provide transmission service over distribution facilities to a total of nine municipal entities under rates approved by FERC. The voltages of these distribution facilities is below 34.5 kV. FERC's exercise of jurisdiction with respect to these facilities is solely for the limited purpose of approving the rates charged to the municipal entities, and the facilities over which these services are provided are nonetheless primarily used as local distribution facilities.

Factor 1: Local distribution facilities are normally in close proximity to retail customers

1.1 Analysis Approach

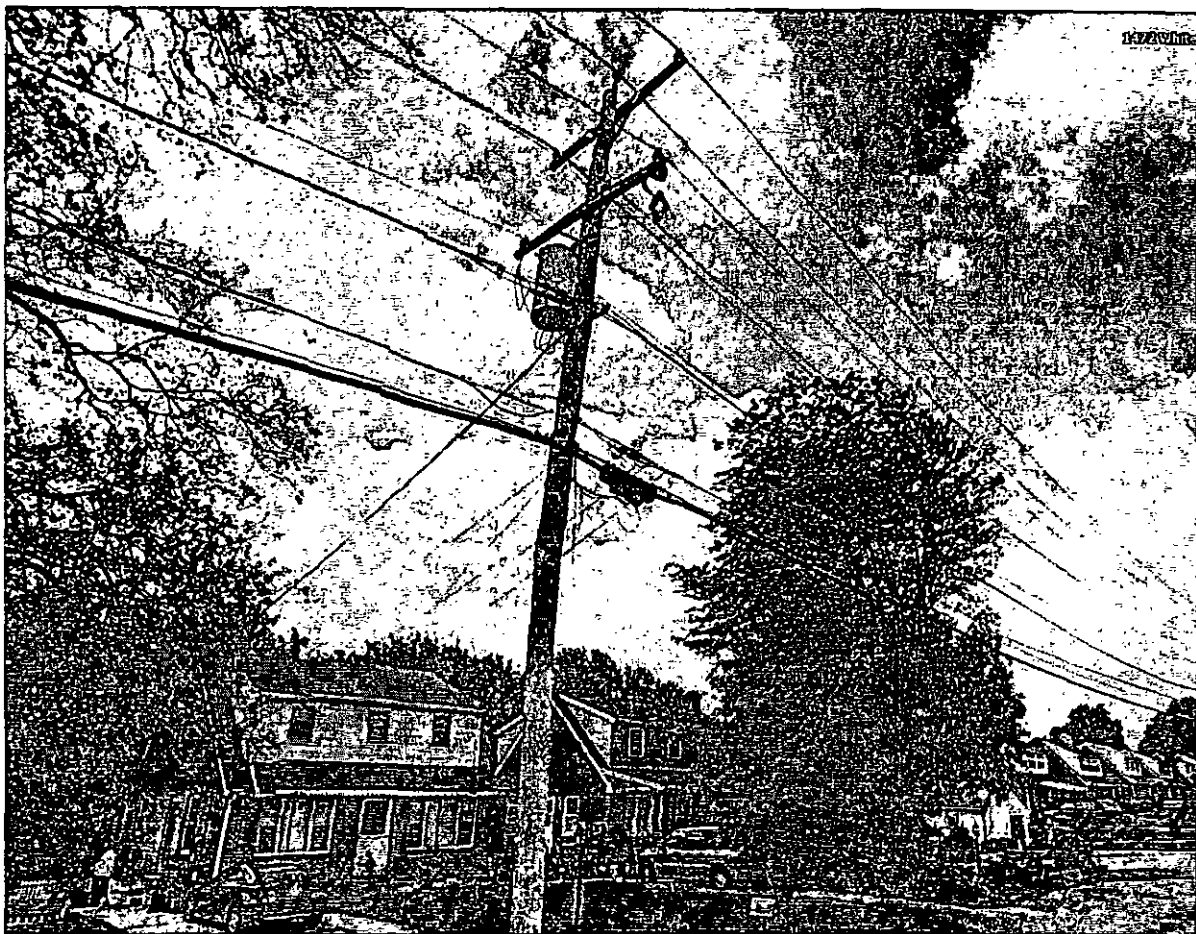
Factor 1 provides that local distribution facilities are normally in close proximity to retail customers. To analyze this factor, we used spatial data from Google Earth to superimpose the power lines listed in Table ES-2 on aerial snapshots of all three FirstEnergy Subsidiary Utilities' service areas. Using snapshots, we could measure the physical distance between specific power lines to retail customers.

For 34.5 kV and higher voltages, we measured the distance of the pole lines to retail customer property at uniform length intervals (see Figure 1 - Measuring Customer Distance from Power Lines). For voltages Less than 34.5 kV, we measured the length of the service drop from the distribution pole to customer property (see Figure 2 - Measuring Customer Distance of Power Lines with Voltages Less than 34.5 kV in Google Earth). We randomly sampled a quarter of the pole miles for each voltage class for each of the three FirstEnergy Subsidiary Utilities; a sample that we determined would give accurate estimates of customer distances for each of the voltage classes.

Figure 1 - Measuring Customer Distance from Power Lines



Figure 2 - Measuring Customer Distance of Power Lines with Voltages Less than 34.5 kV in Google Earth



1.2 Results

Based on the results of our Factor 1 analysis, we conclude that facilities operated by the three FirstEnergy Subsidiary Utilities at voltages less than 34.5 kV are indicative of local distribution, and facilities operated at voltages 34.5 kV and higher are indicative of transmission.

For each of the three FirstEnergy Subsidiary Utilities, the survey showed that facilities with voltages of 34.5 kV or higher for the majority of their lengths are located in designated "rights-of-way," either along railways or water bodies, or in cleared corridors. These rights-of-way are generally a significant distance away from private property and public roads. (see Figure 3 - Google Earth View of 34.5 kV Power Lines in a Right-of-Way in JCP&L) for an example. This is consistent with a transmission classification.

In contrast, facilities with voltages less than 34.5 kV are usually located on poles along public roads, close to customer property. For many customer properties, wires, typically between 30 and 100 feet long, run from a pole mounted distribution transformer to the customer's electric meter (see Figure 3-

Measuring Customer Distance of Power Lines with Voltages less than 34.5 kV in Google Earth for an example). This is consistent with a distribution classification.

Figure 3 - Google Earth View of 34.5 kV Power Lines in a Right-of-Way in JCP&L



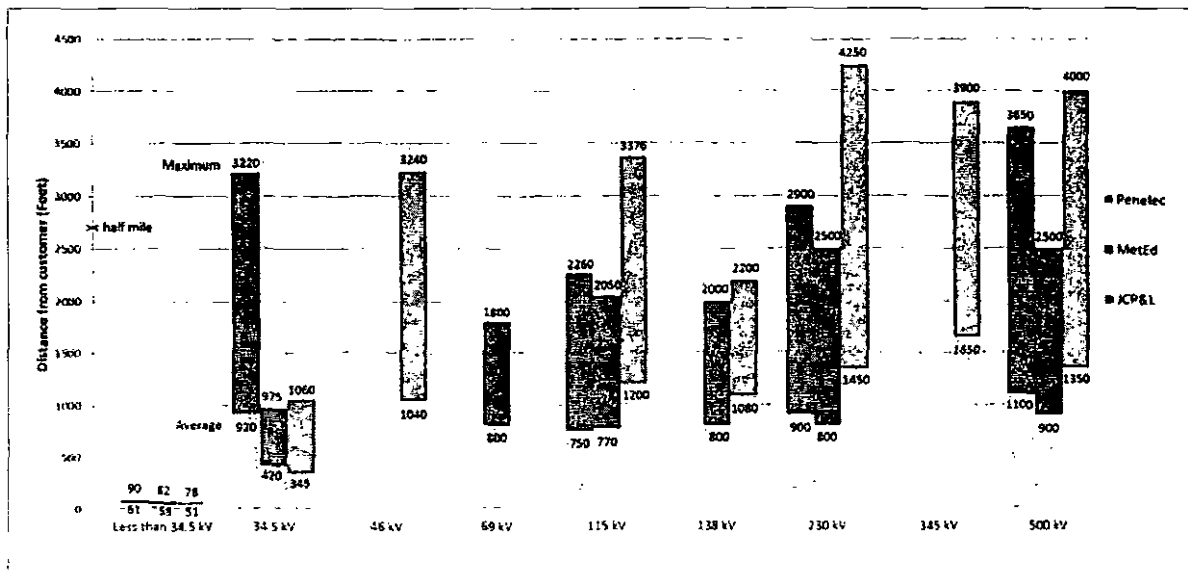
Table 1 - Average and Maximum Distances (in Feet) to Customer and Figure 4 - Average and Maximum Distances (in Feet) to Customer, show the average and maximum distances from sampled customer properties for each of the voltage classes. Figure 4 shows a dramatic difference in proximity to customers between the 34.5 kV and above voltage lines and the less than 34.5 kV voltage lines. The vast majority of the less than 34.5 kV voltage lines are located an average of 50 to 60 feet from customers, close enough for a wire to be dropped directly from the line to the customer's property. For the 34.5 kV and higher voltage lines, similar direct customer connections are rare. The average distance of the JCP&L 34.5 kV voltage lines from the customers is 920 feet, and higher voltages are at similar distances from customers.

The layout of the three FirstEnergy Subsidiary Utilities' systems thus showed that only facilities less than 34.5 kV are "in close proximity to retail customers," which under Factor 1 would indicate a distribution classification. The 34.5 kV and higher voltage lines are not "in close proximity to retail customers," so Factor 1 indicates a transmission classification for these higher voltage facilities.

Table 1 - Average and Maximum Distances (in Feet) to Customer

Voltage Level	Operating Company					
	JCP&L		Met-Ed		Penelec	
	Average	Maximum	Average	Maximum	Average	Maximum
Less than 34.5 kV	61	90	55	82	51	78
34.5 kV	920	3220	420	975	345	1060
46 kV	-	-	-	-	1040	3240
69 kV	-	-	800	1800	-	-
115 kV	750	2260	770	2050	1200	3376
138 kV	-	-	800	2000	1080	2200
230 kV	900	2900	800	2500	1340	4250
345 kV	-	-	-	-	1650	3900
500 kV	1100	3650	900	2500	1350	4000

Figure 4 - Average and Maximum Distances (in Feet) to Customer



Factor 2: Local distribution facilities are primarily radial in character.

2.1 Analysis Approach

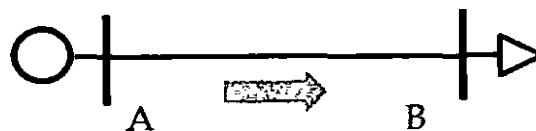
The second factor provides that “local distribution facilities are primarily radial in character.” Under Factor 2, we analyzed which of the three FirstEnergy Subsidiary Utilities’ lines operate in a radial (distribution) or networked (transmission) character.

A “radial line” is normally supplied by a single source of power using one line, and power flows in one direction from the source at point A to the customer at point B (see Figure 5 - Radial in Character). If the single source of power at point A is lost, or the line breaks, the customer at point B loses power.

A “network line” typically has two or more paths of sources and two or more lines supplying the customer for enhanced reliability. With a network line, the loss of one power source or one line usually does not cause the customer to lose power (see Figure 6 - Network in Character).

Sometimes, for improved reliability, tie switches between radial lines are installed to quickly transfer the customer’s load to an alternate supply or in advance of converting the radial line to a network line. From a customer’s perspective, this is typically considered as having two feeds, one being “hot” and the other as being “hot standby” (see Figure 7 - Hot Standby Character).

Figure 5 - Radial in Character



A-B Radial (local or distribution)

Figure 6 - Network in Character

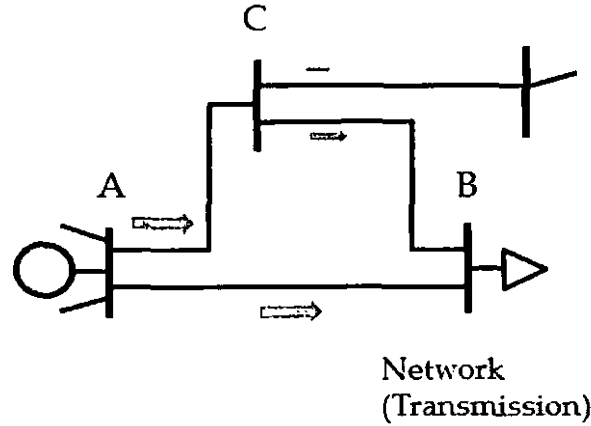
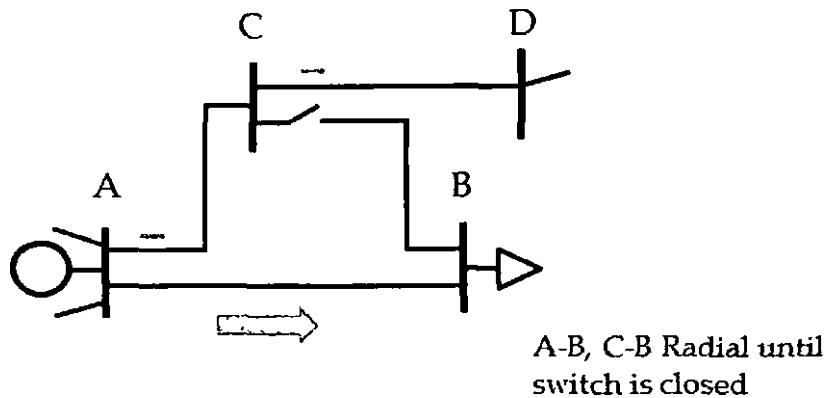


Figure 7 - Hot Standby Character



FirstEnergy retained PowerGEM, another independent consultant, to assist by performing a power flow study to determine which of the three FirstEnergy Subsidiary Utilities' lines are radial and which are networked. Power flow studies are commonly used in the energy industry to determine how power would flow through a particular line based on a range of mathematical inputs to the model. The model used by PowerGEM was produced in February 2014 for the expected 2018 summer peak condition. The Power Flow Model represents over 65,000 buses, with the focus being on the buses in the areas of the three FirstEnergy Subsidiary Utilities for this analysis. All calculations were based on linear ("DC") power flow methods. In a linear power flow analysis it is assumed that there is no change in voltages or line losses during varying grid conditions or contingencies. Linear methods are a suitable means of performing the seven-factor analysis because the primary attribute leading to characterization of a facility as transmission or local distribution is the relative impedance of each facility and its location on the electric grid. Table 2 - Number of FirstEnergy Subsidiary Facilities Included in Power Flow Study shows the facilities for the three FirstEnergy Subsidiary Utilities that were included in PowerGEM's power flow study.

Table 2 - Number of FirstEnergy Subsidiary Facilities Included in Power Flow Study

Voltage Class	Penelec	Met-Ed	JCPL	Ties	Total
34.5 kV	0	0	618	0	618
46 kV	136	0	0	0	136
69 kV	0	112	0	2	114
115 kV	148	69	21	12	250
138 kV	0	0	0	2	2
230 kV	33	20	75	47	175
345 kV	5	0	0	5	10
500 kV	0	0	0	24	24
500 kV Trf *	0	0	0	8	8
345 kV Trf	9	0	0	0	9
230 kV Trf	25	20	75	2	122
138 kV Trf	2	1	0	2	5
115 kV Trf	16	4	16	0	36
46 kV Trf	2	0	0	0	2
Total	376	226	805	104	1511

*Trf = Substation Auto Transformer

The power flow study, conducted by PowerGEM, allowed us to analyze each individual line in the three FirstEnergy Subsidiary Utilities' systems to determine if it is a radial or a networked line. We then calculated the percentage of the lines, by voltage classes, that are radial vs. networked.

Navigant validated PowerGEM's percentages of radial vs. networked lines (see PowerGEM's percentages in Table 3 below) by reviewing electric switching schematic data for the three FirstEnergy Subsidiary Utilities. Reviewing electric switching schematics is another means of determining if a line is radial or networked. Reviewing the electrical switching schematics can reveal if a particular line has one source of power and is open on the other end (a radial line), or has multiple sources and multiple lines supply the load (a network line).

2.2 Results

After reviewing the results of the power flow study and the electric switching schematics described above, Navigant concluded that essentially all of the lines operating at less than 34.5 kV, the Met-Ed 34.5 kV lines, and essentially all the Penelec 34.5 kV lines are radial in nature, consistent with a classification as local distribution. Most of the JCP&L 34.5 kV lines and all of the three FirstEnergy Subsidiary Utilities' higher voltage lines are networked, consistent with a classification as transmission. Table 3 - Percentage of Lines that Operate in Radial vs Networked Fashion shows the results of the power flow study.

Table 3 - Percentage of Lines that Operate in Radial vs Networked Fashion

Results	Normal Operating Configuration	*Tie Switches Closed
Less than 34.5 kV	~100% Radial (Note that cities sometimes are networked feed)	
34.5 kV Met-Ed	100% Radial	
34.5 kV Penelec	90% Radial	
34.5 kV JCP&L	25% Radial	2% Pure Radial
46 kV Penelec	45% Radial	21% Pure Radial
69 kV Met-Ed	7% Radial	4% Pure Radial
115 kV All areas	10% Radial	8% Pure Radial
230 kV All areas	4% Radial	0% Pure Radial
345 kV All areas	0% Radial	0% Pure Radial
500 kV All areas	0% Radial	0% Pure Radial

** For comparison only; some lines operate as loops with tie switches open.*

As shown in Table 3, the 46 kV lines in Penelec are presently 45% radial. Because the majority of the lines are networked, a transmission classification under Factor 2 is reasonable. A review of the electric switching schematic showed that the 46 kV Penelec lines have tie switches that could be closed to create an even higher percentage of network reliability. While power flow constraints and other operating limitations currently require these switches to remain open at this time, changes to the system may result in the switches being closed in the future so that more of the lines can be operated in a networked fashion.

Factor 3: Power flows into local distribution systems; it rarely, if ever, flows out

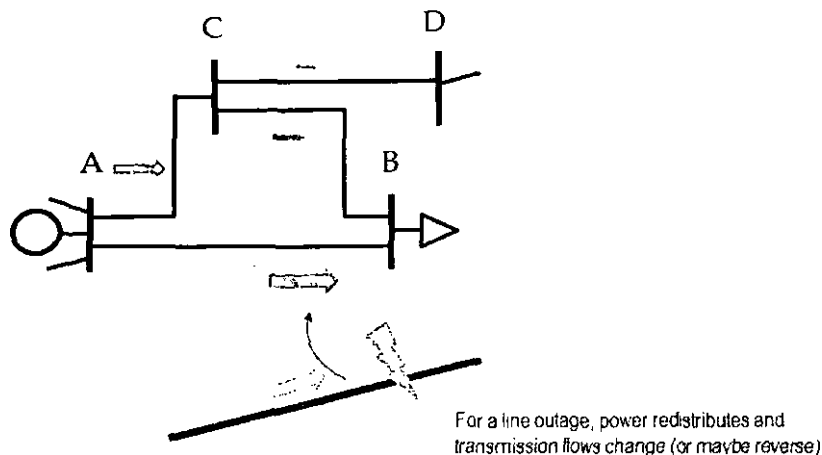
3.1 Analysis Approach

The third factor in FERC’s seven factor analysis provides, “power flows into local distribution systems; it rarely, if ever, flows out.” As illustrated in Table 3 above, 100 % of the less than 34.5 kV lines, 100% of the Met-Ed 34.5 kV lines and 90% of the Penelec 34.5 kV lines are radial in nature, which means that power on those radial lines typically flow in one direction, and cannot flow out. As illustrated in Figure 5 - Radial in Character, power normally flows in a single direction from the source at point A to the customers at point B. Thus, the less than 34.5 kV, the Met-Ed 34.5kV and the Penelec 34.5 kV lines are indicative of local distribution under this factor.

We used the PowerGEM power flow studies to analyze this factor for networked JCP&L 34.5 kV and higher voltage lines. Specifically, we used the “through flow” test to measure power flow changes that occur during an event like a line outage. In some instances, the power transfer during an event was large enough that the normal power flow reversed direction. This is termed the “reverse flow” test. As an example, using Figure 8 - Power Flows Redistributes, should a line outage occur from point A to B, the power flow would redistribute to points A to C to B and the power from C to D may automatically reverse direction in order to supply power to point B.

We used the “through flow” and the “reverse flow” tests to determine whether changes in dispatch patterns among generators, located in the three FirstEnergy Subsidiary Utilities’ service areas, would cause changes in power flows on specific lines. Generators within the three FirstEnergy Subsidiary Utilities’ service areas were used for this test because of the level of impact these generators would have on the facilities. For each line outage, if the model showed changes in power flow or if the flow reversed direction, we viewed this as indicative of transmission under Factor 3. If the model did not show any changes in power flow, we viewed this as indicative of distribution under Factor 3.

Figure 8 - Power Flows Redistributes



3.2 Results

We conclude that the less than 34.5 kV lines, the Met-Ed 34.5 kV lines and the Penelec 34.5 kV are indicative of local distribution and the JCP&L 34.5 kV and higher voltage lines are indicative of transmission under Factor 3.

As noted above, 100% of the less than 34.5 kV lines, 100% of the Met-Ed 34.5 KV lines and 90% of the Penelec 34.5 kV lines are radial in nature, meaning that power can only flow one way on these lines, and cannot flow out. Thus, it was not necessary (or even possible) to conduct power flow studies for the less than 34.5 kV lines, the Met-Ed 34.5 kV lines and 90% of the Penelec 34.5 kV lines in order to conclude that they are indicative of distribution under factor 3.

Table 4 - Summary of Through Flow and Reverse Flow Analysis, indicates the percentage of the lines that showed changes in power flow, and the percentage of the lines that reversed power direction, under the different system conditions that were modeled. JCP&L 34.5 kV and above voltage facilities did change power flow and they all had between 18% to 34% of their facilities reversing power flow direction during various models. This is consistent with a transmission classification under Factor 3.

Table 4 - Summary of Through Flow and Reverse Flow Analysis

Results	Through Flow Test Percent Changed	Reverse Flow Test Percent Changed
Less than 34.5 kV	N/A	N/A
34.5 kV Met-Ed	N/A	N/A
34.5 kV Penelec	N/A	N/A
34.5 kV JCP&L	68%	18%
46 kV Penelec	56%	24%
69 kV Met-Ed	94%	34%
115kV All areas	91%	29%
230 kV All areas	100%	27%
345 kV All areas	100%	20%
500 kV All areas	100%	20%

Since JCP&L 34.5 kV had a slightly lower reverse power flow result when compared to the higher voltage lines, Navigant performed three additional reviews to assure proper classification of transmission for this factor. First, we reviewed the history of line outages, over a two-year period, for the lines used in the model. This review confirmed that what was modeled in the power flow analysis did occur multiple times over the years.

Secondly we reviewed system impact studies to determine what triggered system upgrades on the lines. We examined the JCP&L 34.5 kV system impact study for the Neptune HVDC line from Sayreville 230

kV substation (in New Jersey) to Duffy 345 kV substation (in Long Island), which confirmed that several 34.5 kV JCP&L facilities required system upgrades due to power flow constraints when this higher voltage line was proposed to be installed. The study revealed that the project created multiple overloads on the 34.5 kV JCP&L lines, resulting in a need for more than one million dollars in system upgrades. These system upgrades are a clear indication that the 34.5 kV JCP&L system is networked in such a way that *power flows in multiple directions*.

The third review was to determine if generators were connected to the 34.5 kV lines and selling power into the PJM market. Navigant determined that there are 9 generators that are connected to the JCP&L 34.5 KV line selling power to the PJM Market. This demonstrates the lines are used to supply power both in and out of the network.

Factor 4: When power enters a local distribution system, it is not re-consigned or transported on to some other market.

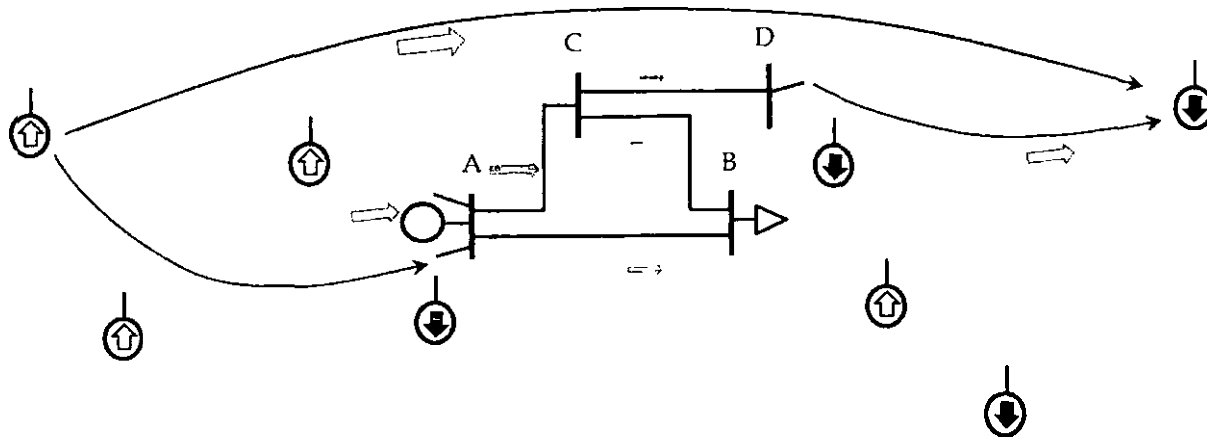
4.1 Analysis Approach

Factor 4 states that, "when power enters into a local distribution system, it is not re-consigned or transported on to some other market." Under this factor, we identified which of the three FirstEnergy Subsidiary Utilities' lines carry power flows that serve the broader PJM electricity market. This "through flow" carried by transmission facilities differs from the through flow measured in the Factor 3 tests in that the activity we analyzed under Factor 4 involves generation sources not connected to the three FirstEnergy Subsidiary Utilities' facilities. Distribution facilities will not transport the flows from generation sources not connected to three FirstEnergy Subsidiary Utilities' facilities, but a transmission facility will.

Our analysis of the three FirstEnergy Subsidiary Utilities' systems under Factor 4 consisted of power flow simulations to test whether generation pattern changes *outside* the three FirstEnergy Subsidiary Utilities' region are carried by the three FirstEnergy Subsidiary Utilities' facilities. A demonstration that power flow changes on a particular facility when triggered by broader PJM market activities would be an indication of transmission under Factor 4. At a fixed demand level, the power flow on a distribution facility will not change as the market generation mix changes.

Figure 9 - Market Impact

When generator outputs change in the market flows change in transmission facilities



4.2 Results

Table 5 - Percentage of Lines Affected By Generators Outside the FirstEnergy Subsidiary Region, shows the through flow participation of the three FirstEnergy Subsidiary Utility lines when generators not connected to the three FirstEnergy Subsidiary Utilities change their dispatch patterns. The results, shown in Table 5, are the number of lines, by percentage, that do not transfer power within the broader PJM market. As shown in the table, 100% of the less than 34.5 kV lines, 100% of the Met-Ed 34.5 kV and 93% of the Penelec 34.5 kV lines do not transfer power for generators not connected to the three FirstEnergy Subsidiary Utilities; this is indicative of a distribution classification under Factor 4. The majority of the JCP&L 34.5 kV and three FirstEnergy Subsidiary Utilities' higher voltage facilities do transfer power from external market activity; this is consistent with a transmission classification under Factor 4.

Since 60% of Penelec's 46 kV lines did not carry power from external market activity, we assigned a distribution classification to these lines. As discussed elsewhere in this report, all of the other factors in the seven-factor test indicate that Penelec's 46 kV lines should be classified as transmission, so we conclude that the primary purpose of Penelec's 46 kV lines is transmission, notwithstanding the results under Factor 4.

Table 5 - Percentage of Lines Affected By Generators Outside the FirstEnergy Subsidiary Region

Results	Through Flow Test Percent Not Changed
Less than 34.5 kV	100%
34.5 kV Met-Ed	100%
34.5 kV Penelec	93%
34.5 kV JCP&L	34%
46 kV Penelec	60%
69 kV Met-Ed	0-7%
115 kV All areas	0-17%
230 kV All areas	7%
345 kV All areas	0%
500 kV All areas	0%

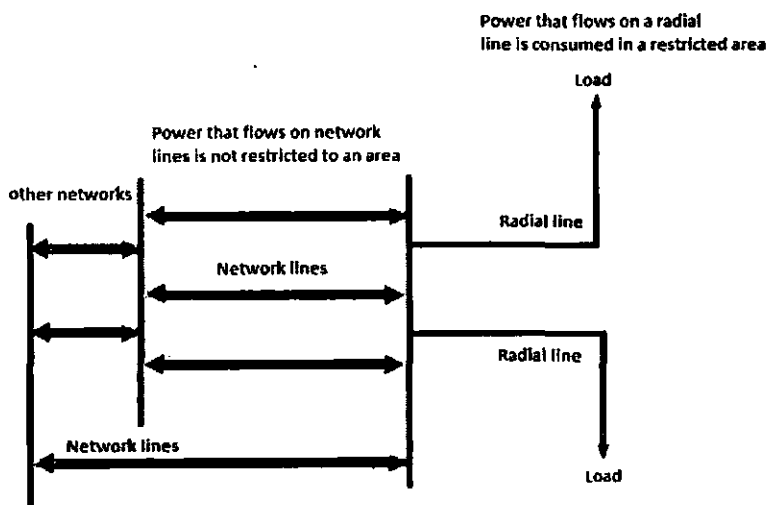
Factor 5. Power entering a local distribution system is consumed in a comparatively restricted geographical area

5.1 Analysis Approach

Factor 5 states that “power entering a local distribution system is consumed in a comparatively restricted geographical area.” Power that flows on radial lines is always consumed in a restricted area, since the power flows to the customers located at fixed geographic regions. Power that flows on “pure” network lines is not consumed in a restricted area since the power, at any given time, can flow in either direction, across the network or to another network. Figure 10 - Power Consumed in a Restricted Area, illustrates that radial lines provide power in a defined or restricted area and network lines provide power in a non-restricted area. To determine this factor, for each voltage level, Navigant determined what percentage of the power is used to supply radial load. In order to perform this analysis, Navigant reviewed the electrical schematics, GIS records, loading data and other documents to determine the percentage of power supplying radial loads. The percentage of power flowing radially, at each voltage level, is consumed in a comparatively restricted area for purposes of Factor 5.

As an example, in the Penelec service area we determined that there are 21 electrical substations that are supplied by radial 46 kV lines. It was also determined, from actual load data, that these 21 electrical substations had a 2014 summer peak load of 126 MW (power). Based on actual load data, it was determined that the total 2014 summer peak power usage for all the Penelec 46 kV lines was 415 MW. Based on this information, we determined that 30% ($126 / 415 = 30\%$) of the total amount of power on the Penelec 46 kV lines served radial load. Therefore, it is concluded that 30% of the power that flows on Penelec’s 46 kV lines is delivered to customers in a comparatively restricted geographic area. A similar analysis was performed for each of the three FirstEnergy Subsidiary Utilities.

Figure 10 - Power Consumed in a Restricted Area.



5.2 Results

Table 6 - Power Consumed in a Relatively Restricted Geographic Area, summarizes the results under Factor 5. As shown in Table 6, 100% of the power that flows on the lines with a voltage level less than 34.5 kV, 100% of the Met-Ed 34.5 kV and 86% of the Penelec 34.5 kV is consumed in a comparatively restricted geographic area.

It was determined that only a small percentage of the power flowing on the JCP&L 34.5 kV lines, the Penelec 46 kV, and the higher voltage lines is consumed in a comparatively restricted geographic area. Therefore, under Factor 5, the lines with voltage levels less than 34.5 kV, the Met-Ed 34.5 kV lines and the Penelec 34.5 kV lines are indicative of local distribution. The JCP&L 34.5 kV lines and higher voltage lines are indicative of transmission.

Table 6 - Power Consumed in a Relatively Restricted Geographic Area

Results	Power Consumed in Restricted Geographic Area
Less than 34.5 kV	100% Local
34.5 kV Met-Ed	100% Local
34.5 kV Penelec	86% Local
34.5 kV JCP&L	25% Local
46 kV Penelec	30% Local
69 kV Met-Ed	< 1% Local
115 kV All areas	0% Local
230 kV All areas	0% Local
345 kV All areas	0% Local
500 kV All areas	0% Local

Factor 6. Meters are based at the transmission/local distribution interfaces to measure flows into the local distribution system

6.1 Analysis Approach

The sixth factor in FERC's seven-factor test indicates that, for local distribution facilities, "meters are based at the transmission/local distribution interfaces to measure flows into the local distribution system." Under this factor, Navigant reviewed various reports that indicated the location, voltage level, and purpose of meters installed at various locations by the three FirstEnergy Subsidiary Utilities. It was determined that there are typically two types of meters: "customer revenue meters," which are used to measure power consumption used by the retail customers, and "bi-directional tie-line meters," which are used to measure flow on network lines that record power flow in the forward and reverse direction. Customer revenue meters are indicative of local distribution, while bi-directional tie-line meters are indicative of transmission.

6.2 Results

Under our Factor 6 analysis, as shown in Table 7 - Percentage of Revenue Meters and Number of Bi-Directional Tie Meters, the voltages less than 34.5 kV, Met-Ed 34.5 kV and Penelec 34.5 kV would be considered distribution facilities and the JCP&L 34.5 kV and higher voltage lines would be considered transmission facilities.

Navigant determined that the three FirstEnergy Subsidiary Utilities have more than 2.24 million customer revenue meters measuring electricity sales to retail customers. We also determined there are approximately 428 customer revenue meters measuring sales to retail customers installed on the 34.5 kV and higher voltage lines. Thus, virtually all of the customer revenue meters are installed on voltages less than 34.5 kV lines. The customer revenue meters that are installed on the 34.5 kV and higher voltage lines are, for the most part, associated with "primary meter customers." Primary meter customers are very large commercial/industrial customers that have a high power demand. Typically this high power demand cannot be accommodated on the lower voltage lines without causing overload and/or low voltage conditions.

Navigant determined that there are bi-directional tie-line meters installed on tie-lines for the 500 kV, 345 kV, 230 kV, 138 kV, 115 kV, 69 kV, 46 kV and JCP&L 34.5 kV facilities. There are no bi-directional tie-line meters at voltages levels less than 34.5 kV, Met-Ed 34.5 kV, or Penelec 34.5 kV lines.

Table 7 - Percentage of Revenue Meters and Number of Bi-Directional Tie Meters

Voltage - Service Area	One Way Revenue Meters	Bi-Directional Tie-Line Meters
Less than 34.5 kV - All	100%	0
34.5 kV - Met-Ed	≈0 **	0
34.5 kV - Penelec	≈0	0
34.5 kV - JCP&L	≈0	5
46 kV - Penelec	≈0	1
69 kV - Met-Ed	≈0	2
115 kV/138 kV - All	≈0	16
230 kV - All	0	64
345 kV - All	0	3
500 kV - All	0	10

* Bi-directional meter associated with "Normally Open tie point"

** Very limited number of primary metered customers at higher voltages

Factor 7: Local distribution systems will be of a reduced voltage.

7.1 Analysis Approach

Factor 7 states that “local distribution systems will be of a reduced voltage.” There are more than 2 million customers in the Penelec, Met-Ed, and JCP&L service areas. The majority of these customers require a voltage of 120V/240V, 277V/480V or other secondary voltage. In order to provide this secondary voltage, the three FirstEnergy Subsidiary Utilities utilize pole top distribution transformers and other distribution transformers connected to the high voltage lines to convert the high voltage to *reduced secondary voltage levels*.

Navigant reviewed the electrical specifications and other documentation for the distribution transformers to determine what voltage level they were designed to be connected to. In addition, we examined the records for the quantity and type of pole top transformers installed over the last 12 months. Google Earth was used to verify the accuracy of the records and to validate the voltage levels that had distribution transformers installed. Using electrical schematics and other documentation, we determined the percentage of customers supplied by the different voltage levels.

7.2 Results

Under our Factor 7 results, as summarized in Table 8 - Percentage of Customers Served at Different Voltage Levels, it was determined that the less than 34.5 kV lines, the Met-Ed 34.5 kV and Penelec 34.5 kV lines are part of the local distribution system. The JCP&L 34.5kV lines and higher voltage lines are part of the transmission system.

Navigant determined that Penelec and Met-Ed connected pole top distribution transformers to primary lines with a voltage of 34.5 kV and lower. We determined that JCP&L does not connect pole top distribution transformers to the 34.5kV lines. The three FirstEnergy Subsidiary Utilities have not installed any pole top transformers on their 46 kV, 69 kV, 115 kV, 138 kV, 230 kV, 345 kV, or 500 kV lines. There are a very limited number of commercial/industrial customers (less than 1% of total customers) that required a distribution transformer to be connected to the higher voltage lines. These commercial/industrial customers are “primary metered customers” with a very high current demand and in some cases utilized a higher secondary voltage. Navigant also found that 99% of all JCP&L, Penelec and Met-Ed customers are supplied by pole top distribution transformers connected to less than 34.5 kV (see Table 8). Less than 1% of the customers are connected to the higher voltage lines.

Table 8 - Percentage of Customers Served at Different Voltage Levels

Results	Pole Top Distribution Transformer used to create reduced customer voltage	% of customers connected at voltage level
Less than 34.5 kV	Yes	> 99%
34.5 kV Met-Ed	Yes	< 1% (219 cust.)
34.5 kV Penelec	Yes	< 1% (10 cust.)
34.5 kV JCP&L	No	< 1% (145 cust.)
46 kV Penelec	No	< 1% (46 cust.)
69 kV Met-Ed	No	< 1% (16 cust.)
115 kV All areas	No	≈ 0%
230 kV All areas	No	0%
345 kV All areas	No	0%
500 kV All areas	No	0%

Conclusion

Based on our review of the three FirstEnergy Subsidiary Utility facilities using FERC's seven factor test, we conclude that the JCP&L 34.5 kV facilities and all facilities with a voltage level greater than 34.5 kV are transmission facilities. The 34.5 kV Met-Ed lines, 34.5 kV Penelec lines and all lines with a voltage levels less than 34.5 kV are local distribution. This conclusion is fully supported by the data we reviewed as part of our analysis under each of the seven factors FERC identified in Order No. 888. With the exception of a small amount of Met-Ed 34.5kV, our conclusion is consistent with the facilities' existing classifications and the FirstEnergy Subsidiary Utilities' historical operation.

Table 9 - Final Determination of Asset Classification Indicators

Voltage Levels	Operating Companies		
	Penelec	Met-Ed	JCP&L
500 kV	T	T	T
345 kV	T	-	-
230 kV	T	T	T
138 kV	T	T	-
115 kV	T	T	T
69 kV	-	T	-
46 kV	T	-	-
34.5 kV	D	D	T
19.9/34.5 kV wye	D	D	D
13.2/23 kV wye	D	-	-
7.62/13.2 kV wye	-	D	-
7.2/12.5 kV wye	D	-	D
12.0 kV delta	D	-	-
4.8/8.32 kV wye	D	-	-
7.2 kV delta	D	-	-
2.4/4.8 kV delta	D	-	-
4.8 kV delta	D	D	D
2.4/4.16 kV wye	D	-	D

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**JOINT APPLICATION OF MID-
ATLANTIC INTERSTATE
TRANSMISSION, LLC (“MAIT”);
METROPOLITAN EDISON COMPANY
 (“MET-ED”) AND PENNSYLVANIA
ELECTRIC COMPANY (“PENELEC”)
FOR: (1) A CERTIFICATE
OF PUBLIC CONVENIENCE UNDER
66 PA.C.S. § 1102(A)(3) AUTHORIZING
THE TRANSFER OF CERTAIN
TRANSMISSION ASSETS FROM MET-
ED AND PENELEC TO MAIT;
(2) A CERTIFICATE OF PUBLIC
CONVENIENCE CONFERRING UPON
MAIT THE STATUS OF A
PENNSYLVANIA PUBLIC UTILITY
UNDER 66 PA.C.S. § 102; AND
(3) APPROVAL OF CERTAIN
AFFILIATE INTEREST AGREEMENTS
UNDER 66 PA.C.S. § 2102**

Docket Nos.: A-2015-2488903, et al.

VERIFICATION

I, Charles V. Fullem, hereby state that the facts set forth in the pre-marked statements and exhibits listed below are true and correct to the best of my knowledge, information and belief. I understand that this verification is made subject to the provisions and penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Joint Applicants’ Statement Nos. 1, 1S and 1-R.

Exhibit CVF- 1	Organizational Charts
Exhibit CVF- 2	Navigant Study
Exhibit CVF- 3	Letters to IBEW Locals 459 and 777

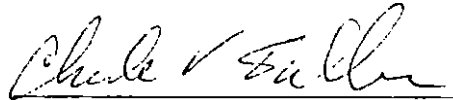
Exhibit CVF- 4

FERC Approved Returns on Equity

Exhibit 1-Settlement

Responses to TUS Interrogatories (cosponsored)

Date: 2/25/2016


Charles V. Fullem