

**FILE**

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**BEFORE**

**THE PUBLIC UTILITIES COMMISSION OF OHIO**

**Case No. 10-503-EL-FOR**

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**In the matter of Duke Energy Ohio, Inc.**

**2010 Electric Long-Term Forecast**

**Report and Resources Plan**

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**Direct Testimony**

**Contains Confidential Information**

**Prepared by:**

**Peter Lanzalotta**

**Lanzalotta & Associates LLC**

**67 Royal Point Drive, Hilton Head Island, SC 29926**

**Prepared for:**

**The Natural Resources Defense Council and Sierra Club**

**RECEIVED**

**MAR 14 2011**

**DOCKETING DIVISION  
Public Utilities Commission of Ohio**

1    **Q.    Mr. Lanzalotta, please state your name, position and business address.**

2    A.    My name is Peter J. Lanzalotta. I am a Principal with Lanzalotta & Associates LLC,  
3        ("Lanzalotta"), 67 Royal Point Drive, Hilton Head Island, SC 29926.

4    **Q.    On whose behalf are you testifying in this case?**

5    A.    I am testifying on behalf of the Natural Resources Defense Council ("NRDC") and the  
6        Sierra Club.

7    **Q.    Mr. Lanzalotta, please summarize your educational background and recent work**  
8        **experience.**

9    A.    I am a graduate of Rensselaer Polytechnic Institute, where I received a Bachelor of  
10        Science degree in Electric Power Engineering. In addition, I hold a Masters degree in  
11        Business Administration with a concentration in Finance from Loyola College in  
12        Baltimore.

13        I am currently a Principal of Lanzalotta & Associates LLC, which was formed in January  
14        2001. Prior to that, I was a partner of Whitfield Russell Associates, with which I had  
15        been associated since March 1982. My areas of expertise include electric system  
16        planning and operation. I am a registered professional engineer in the states of Maryland  
17        and Connecticut.

18        In particular, I have been involved with the planning and operation of electric utility  
19        systems as an employee of and as a consultant to a number of privately- and publicly-  
20        owned electric utilities over a period exceeding thirty years.

1 I have presented expert testimony before the FERC and before regulatory commissions  
2 and other judicial and legislative bodies in 22 states, the District of Columbia, and the  
3 Provinces of Alberta and Ontario. My clients have included utilities, state regulatory  
4 agencies, state ratepayer advocates, independent power producers, industrial consumers,  
5 the United States Government, environmental interest groups, and various city and state  
6 government agencies.

7 A copy of my current resume is included as Exhibit PJJ-1 and a list of my testimonies is  
8 included as Exhibit PJJ-2.

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

10 A. I was retained by to evaluate Duke's transmission system in Ohio and to study its ability  
11 to reliably accommodate the near-term closure of the coal-fired generation units at the  
12 Beckjord Station. This testimony presents the results of our evaluation.

13 **Q. Please explain how you conducted your analyses.**

14 A. I have reviewed the following information in our investigation:

15 i. Duke's IRP, formally titled Duke Energy Ohio, Inc. 2010 Electric Long-  
16 Term Forecast Report And Resource Plan, filed June 15, 2010 ("IRP"),  
17 and the February 2011 revised Resource Plan filing.

18 ii. The responses by Duke to discovery questions submitted by NRDC in this  
19 case.

20 iii. Various publicly-available transmission planning documents from the  
21 Mid-West ISO and the PJM websites.

1 Using the information from these sources, a load flow study was performed on the Duke  
2 system to study the loading levels and voltage levels that result from shutting down the  
3 coal-fired generation at the Beckjord Station.

4 **Q. Please summarize your conclusions.**

5 A. My conclusion is that the Duke transmission system as portrayed in Duke's 2015 base  
6 case is capable of meeting mandatory NERC transmission system planning requirements  
7 and Duke system planning practices, all of which address the electric system's capability  
8 to provide reliable electric service, even if all of the Beckjord coal-fired generation is  
9 retired within the next several years with little or no transmission system reinforcement.

10 **Q. Please describe the generation that is currently in operation at the Beckjord Station.**

11 A. There are currently ten generating units operated by Duke at Beckjord, consisting of four  
12 combustion turbine ("CT") generating units with a summer maximum generating  
13 capacity of 47,000 kilowatts ("kW") each and six coal-fired ("CF") steam generating  
14 units with a combined summer maximum generating capacity of 859,000 kW in total.  
15 All of the CTs and five of the six CF generating units, Unit Nos. 1-5, are wholly owned  
16 by Duke. The sixth CF generating unit, Unit No. 6, is jointly owned by Duke (37.5%),  
17 Dayton Power & Light Company (50%), and Columbus Southern Power Company  
18 (12.5%).<sup>1</sup>

19 **Q. Please specify which of these generating units you assumed would be shut down in**  
20 **your study.**

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<sup>1</sup> This information taken from or developed from pages 146 and 147 of Duke's IRP.

A. Table 1 below lists the CF generating units which are assumed shut down in my study, along with each generating unit's date of installation and summer maximum generating capacity in kW.

Table 1

Beckjord Coal-Fired Generation		
Unit	Year	Summer
Number	Installed	Max kW
1	1952	94,000
2	1953	94,000
3	1954	128,000
4	1958	150,000
5	1962	238,000
6	1969	155,000
Total		859,000

**Q. Please describe the load flow study process and how it helps study electric system reliability.**

A. The modern electric system is composed of a series of electrical busses, which are located in substations. Transmission lines connect each bus to one or more other busses. On Duke's electric system in Ohio, the bulk transmission system is comprised of transmission lines operating at voltages of 345 kV and 138 kV. There are transformers which provide for electric flow between two busses that are operating at different voltages, such as a 345 kV-to-138 kV transformer. Some substation busses have customer loads hooked up to them, while others have generating units hooked up to them. A load flow study uses a commercially-available load flow computer program which starts with a system configuration made up of digital representations of the system's

1 substation busses, transmission lines, and substation transformers. Projected peak loads  
2 at each substation and a generation dispatch<sup>2</sup> are added, and the load flow model  
3 calculates the amount of power flowing in every transmission line and in every  
4 transformer, as well as the voltage level of every substation bus. The load flow model  
5 can be used to how study system performance changes i) under heavier or lighter peak  
6 load conditions, ii) when the system has been reinforced with new substation busses, new  
7 transmission lines, and/or new substation transformers, iii) when new generating units are  
8 added, existing generating units are retired, or the dispatch of existing generating units is  
9 changed, and iv) under contingency conditions in which one or more system components  
10 are deemed to be unexpectedly forced out of service<sup>3</sup>. In each of these scenarios, the load  
11 flow program will recalculate power flows in all lines and transformers remaining in  
12 service<sup>4</sup> and the voltage levels of all substation busses.

13 **Q. What reliability requirements did you take into account?**

14 A. There is a need for Duke to meet mandatory reliability planning requirements. These  
15 requirements are specified by NERC. NERC, in its transmission planning standards<sup>5</sup>,

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<sup>2</sup> Most electric systems have more generation available than needed to serve the projected peak load. This margin is called a reserve margin. Due to this reserve, transmission planning studies pick which generating units are operated at maximum levels and which are not operated or are operated at reduced levels. Different mixes of operating generation, called generation dispatches, are used to study system performance under differing operating conditions.

<sup>3</sup> A single contingency reflects a single system component being forced out of service.

<sup>4</sup> In the case where outages of transmission lines, transformers, and or other equipment take some system components out of service.

<sup>5</sup> See NERC Standards, TPL-001-1, TPL-002-1b, TPL-003-1a, and TPL-004.

1 describes various system states, including i) normal conditions (no contingencies<sup>6</sup>), single  
2 contingency (referred to as N-1) conditions, multiple contingency conditions (referred to  
3 as N-2 or N-1-1), and extreme contingency conditions, and the NERC standards describe  
4 the minimum system performance required under each set of contingencies. Since the  
5 large blackout in parts of the midwest and northeast in August of 2003, NERC  
6 transmission planning reliability requirements were made mandatory.

7 For our purposes here, the NERC planning requirements that are of the most interest  
8 involve normal system conditions (i.e., no contingencies) and single contingency  
9 conditions. For forecast peak loads under normal system conditions, NERC requires that  
10 all transmission lines and substation transformers are to be loaded no higher than 100%  
11 of their normal maximum ratings<sup>7</sup>, and the voltage of every substation bus should be at  
12 least 95% of nominal voltage.<sup>8</sup> For forecast peak load conditions under any single  
13 contingency situation (i.e., with any one system component forced out of service), NERC  
14 requires that all transmission lines and substation transformers are to be loaded no higher  
15 than 100% of their emergency ratings<sup>9</sup>, and the voltage of every substation bus should be  
16 at least 90% of nominal voltage. Under normal conditions and under single contingency  
17 conditions, NERC generally requires that the system be capable of serving all firm  
18 customer load and carrying all firm transmission transfers.

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<sup>6</sup> A contingency is an unplanned outage of a component of the electric utility system.

<sup>7</sup> Some equipment has different normal and/or emergency ratings for the summer and for the winter. Winter line and transformer ratings are frequently higher due to the effect of colder ambient winter temperatures on the loading capacity of such equipment, whose maximum capacities are often determined by how much they heat up as they carry more and more load.

<sup>8</sup> Nominal voltage for a 345 kV substation bus is 345 kV.

<sup>9</sup> Emergency ratings are typically higher than normal maximum ratings.

1 NERC transmission planning standards also address multiple contingency conditions and  
2 extreme contingency scenarios, but do not require that the electric system be capable of  
3 serving all firm customer load and carrying all firm transmission transfers under these  
4 conditions or scenarios. In other words, under double contingencies, or even more severe  
5 conditions, NERC permits firm customer load to be dropped in planning scenarios.

6 Duke also specifies detailed transmission planning criteria in Part 4 of its 2010 FERC  
7 Form 715<sup>10</sup>, which is publicly available on the Mid-West ISO website. These criteria are  
8 generally consistent with the NERC criteria addressed above for normal conditions and  
9 for single contingency conditions. Duke's FERC Form 715, Part 4, addresses the use of  
10 double contingencies thusly:

11 Double contingency line outages are considered primarily in cases involving 138  
12 kV underground cable feeders, which supply the West End and Charles  
13 substations in the Cincinnati, Ohio metropolitan area. For an outage of any other  
14 line with one such underground circuit out of service, the loading on all lines  
15 should be no higher than 100% of the emergency conductor rating and voltage  
16 should be 90% or higher at all points on the 138 kV system.  
17

18 Our study shows that closing the CF generation at Beckjord has a limited impact on the  
19 138 kV feeds to the West End and Charles substations in downtown Cincinnati.  
20 Therefore, these double contingencies were not explicitly modeled.

21 **Q. What is the importance of violations of these transmission planning criteria?**

22 **A.** NERC transmission reliability planning criteria require that upgrades be planned in order  
23 that the transmission planning reliability criteria be satisfied. Duke's transmission

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<sup>10</sup> FERC Form 715 is entitled Annual Transmission Planning and Evaluation Report. Part 4 includes a detailed description of the transmission planning reliability criteria used to evaluate used to evaluate system performance.



1 planning reliability criteria appears to allow more flexibility, although meeting the NERC  
2 criteria remains legally mandatory. Duke's FERC Form 715, Part 4, states (on page 1):

3 Violations of these criteria would result in one or several of the following actions:  
4 expansion of transmission system; operating procedures; or a combination of the  
5 two. Acceptance of operating procedures is based on engineering judgment with  
6 the consideration of the probability of violation weighed against its consequences  
7 and possibly other factors.

8  
9 Duke's FERC Form 715, Part 4, continues (on page 5):

10 These planning criteria are not intended to be absolute or applied without  
11 exception. Other factors, such as severity of consequences, availability of  
12 emergency switching procedures, probability of occurrence and the cost of  
13 remedial action are also considered in the evaluation of the transmission system.  
14

15 **Q. What was the starting point for your analysis?**

16 **A.** The starting point for our analysis was the 2015 base case as referred to in Duke's IRP.<sup>11</sup>  
17 Our analysis assumes that minimizing changes in the loading of transmission lines and  
18 transformers from the levels in this base case will also minimize the development of new  
19 NERC planning violations.

20 **Q. When you model the shutdown of the Beckjord CF generating units, where do you**  
21 **assume that replacement generation comes from?**

22 **A.** Power flows were run that sequentially shut down the Beckjord CF generating Units 1  
23 through 6. While there are innumerable ways to change the dispatch of available  
24 generation to replace the power from the generating units that are being shut down, these  
25 choices can affect the transmission system loading. Since we were not finding  
26 substantive problems in our analysis, it was decided to redispatch generation in a simple

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<sup>11</sup> Page 107.

1 and understandable way. The dispatch was changed by allowing the Browns Ferry  
2 generating station, a big generating station on the TVA electric system, to increase  
3 generation to make up for the reduced Duke generation. Using Browns Ferry has two  
4 advantages. First, it is relatively far away from Duke Ohio. Second, it is connected to  
5 the electric transmission system at 500 kV, a relatively high voltage. Both of these allow  
6 power to readily redistribute through the network and minimize spot impacts, so the  
7 effects of the location of the source of replacement power for this analysis should not  
8 have a particularly large impact. And, at any rate, it was not clear that a different  
9 redispatch method would particularly find problems that this approach missed.

10 As generation within Duke Ohio is reduced by the closure of the Beckjord CF generating  
11 units, the change in power flows over transmission lines depends on the number of paths  
12 available, and the impedance (electrical resistance) of the transmission paths between  
13 where generation changes are made. The biggest changes in power flows will almost  
14 always be close to where the generation changes are made. It is likely that much of the  
15 reduced Duke Ohio generation could be made up by using increased energy efficiency  
16 and demand response, or, if necessary, through the addition of new generating units  
17 within the area. There are several Duke CT generating units that were not modeled as  
18 running in the cases, including the CTs at Miami Fort, and Beckjord CT # 4. If the  
19 Beckjord CT were operating, or if new generating capacity were installed at Beckjord,  
20 any transmission system impacts from closing the Beckjord CF generation would be  
21 reduced even further.

1 Q. Please describe your general approach to this analysis.

2 A. The general approach was to compare [REDACTED]  
3 [REDACTED]  
4 [REDACTED]  
5 [REDACTED]. This comparison looked at the 2015 summer base case  
6 with and without the Beckjord CF generation. [REDACTED]

7 [REDACTED]  
8 [REDACTED]  
9 [REDACTED]  
10 [REDACTED]  
11 [REDACTED]  
12 [REDACTED]  
13 [REDACTED]  
14 [REDACTED]  
15 [REDACTED]  
16 [REDACTED]  
17 [REDACTED]

18 In those instances where the shutdown of the Beckjord CF generating units resulted in a  
19 significant change<sup>12</sup> in the loading of a transmission line that was loaded to 40% or more  
20 of its rated capability, we looked at contingencies that involved those lines to look for

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<sup>12</sup> This was usually taken to mean a ten percent change or more.

1 overloads. We also looked at contingencies of the 345-to-138 kV transformers we  
2 reviewed, regardless of their load levels.

3 **Q. Please describe your findings.**

4 A. We found that the Duke transmission system is quite robust, especially in the vicinity of  
5 Beckjord. We found that the loading of transmission lines was generally light, with many

6 [REDACTED]

7 [REDACTED]

8 [REDACTED] None of the transmission line contingencies we reviewed  
9 produced overloads.

10 The loading of transformers was typically more significant than that of the transmission  
11 lines, and most transformers experienced increases in loading, although none increased in  
12 load enough to have problems in the contingency conditions we reviewed. The before  
13 and after loading of 345 kV and 138 kV transmission lines and transformers is included  
14 in Exhibit PJL-3, which is confidential. The conclusion we reached is that Duke's  
15 electric system in its 2015 base case can be reliably operated to tolerate the shutdown of  
16 the Beckjord CF generating units with little or no transmission reinforcement.

17 **Q. In the event that reinforcement of Duke's transmission system is required, is some**  
18 **expansion capability already provided for in the transmission facilities on Duke's**  
19 **system?**

20 A. Yes. A number of Duke's 138 kV transmission lines are actually designed for 345 kV  
21 operation. As identified on page 88 of Duke's IRP, the following 138 kV transmission  
22 lines are designed to be operated at 345 kV:

23 i) Beckjord to Redbank

- 1           ii)     Red Bank to Terminal
- 2           iii)    Port Union to Evandale
- 3           iv)     Evandale to Terminal
- 4           v)      Foster to Shaker Run
- 5           vi)     Shaker Run to Rockies Express
- 6           vii)    Rockies Express to Todhunter

7           Converting these lines to 345 kV operation would be expected to more than double the  
8           capacity of each of these lines, as indicated on page 88 of Duke's IRP by the difference in  
9           ratings between lines operating at 345 kV and lines designed for 345 kV but operating at  
10          138 kV.

11   **Q.     What implications does the shutdown of the Beckjord CF generating units have for**  
12       **the need for generating capacity on the Duke system in Ohio?**

13   **A.     My analysis does not address the adequacy of the amount of generating capacity**  
14       **available to Duke either before or after the presumed shutdown of the Beckjord CF**  
15       **generating units. I note, however, that if new generation is installed at the Beckjord site,**  
16       **or if increased energy efficiency and/or increased demand response resources get**  
17       **implemented in the areas of the system that are currently supplied by Beckjord**  
18       **generation, it will tend to reduce any negative reliability impacts that may result from the**  
19       **closure of the Beckjord CF generating units.**

20   **Q.     Does this conclude your direct testimony?**

21   **A.     Yes.**

**Prior Experience Of Peter J. Lanzaotta**

Mr. Lanzaotta has more than thirty-five years experience in electric utility system planning, power pool operations, distribution operations, electric service reliability, load and price forecasting, and market analysis and development. Mr. Lanzaotta has appeared as an expert witness on utility reliability, planning, operation, and rate matters in more than 90 proceedings in 22 states, the District of Columbia, the Provinces of Alberta and Ontario, and before the Federal Energy Regulatory Commission. He has developed evaluations of electric utility system cost, value, reliability, and condition. He has participated in negotiations or other interactions between utilities and customers or regulators in more than ten states regarding transmission access, the need for facilities, electric rates, electric service reliability, the value of electric system components, and system operator structure under wholesale competition.

Prior to his forming Lanzaotta & Associates LLC in 2001, he was a Partner at Whitfield Russell Associates for fifteen years and a Senior Associate for approximately four years before that. He holds a Bachelor of Science in Electric Power Engineering from Rensselaer Polytechnic Institute and a Master of Business Administration with a concentration in Finance from Loyola College of Baltimore.

Prior to joining Whitfield Russell Associates in 1982, Mr. Lanzaotta was employed by the Connecticut Municipal Electric Energy Cooperative ("CMEEC") as a System Engineer. He was responsible for providing operational, financial, and rate expertise to Coop's budgeting, ratemaking and system planning processes. He participated on behalf of CMEEC in the Hydro-Quebec/New England Power Pool Interconnection project and initiated the development of a database to support CMEEC's pool billing and financial data needs.

Prior to his CMEEC employment, he served as Chief Engineer at the South Norwalk (Connecticut) Electric Works, with responsibility for planning, data processing, engineering, rates and tariffs, generation and bulk power sales, and distribution operations. While at South Norwalk, he conceived and implemented, through Northeast Utilities and NEPOOL, a peak-shaving plan for South Norwalk and a neighboring municipal electric utility, which resulted in substantial power supply savings. He programmed and implemented a computer system to perform customer billing and maintain accounts receivable

accounting. He also helped manage a generating station overhaul and the undergrounding of the distribution system in South Norwalk's downtown.

From 1977 to 1979, Mr. Lanzaotta worked as a public utility consultant for Van Scoyoc & Wiskup and separately for Whitman Requart & Associates in a variety of positions. During this time, he developed cost of service, rate base evaluation, and rate design impact data to support direct testimony and exhibits in a variety of utility proceedings, including utility price squeeze cases, gas pipeline rates, and wholesale electric rate cases.

Prior to that, He worked for approximately 2 years as a Service Tariffs Analyst for the Finance Division of the Baltimore Gas & Electric Company where he developed cost and revenue studies, evaluated alternative rate structures, and studied the rate structures of other utilities for a variety of applications. He was also employed by BG&E in Electric System Operations for approximately 3 years, where his duties included operations analysis, outage reporting, and participation in the development of BG&E's first computerized customer information and service order system.

Mr. Lanzaotta is a member of the Institute of Electrical & Electronic Engineers, the Association of Energy Engineers, the National Fire Protection Association, and the American Solar Energy Society. He is also registered Professional Engineer in the states of Maryland and Connecticut.

**Proceedings In Which  
Peter J. Lanzalotta  
Has Testified**

1. **In re: Public Service Company of New Mexico**, Docket Nos. ER78-337 and ER78-338 before the Federal Energy Regulatory Commission, concerning the need for access to calculation methodology underlying filing.
2. **In re: Baltimore Gas and Electric Company**, Case No. 7238-V before the Maryland Public Service Commission, concerning outage replacement power costs.
3. **In re: Houston Lighting & Power Company**, Texas Public Utilities Commission Docket No. 4712, concerning modeling methods to determine rates to be paid to cogenerators and small power producers.
4. **In re: Nevada Power Company**, Nevada Public Service Commission, Docket No. 83-707 concerning rate case fuel inventories, rate base items, and O&M expense.
5. **In re: Virginia Electric & Power Company**, Virginia State Corporation Commission, Case No. PUE820091, concerning the operating and reliability-based need for additional transmission facilities.
6. **In re: Public Service Electric & Gas Company**, New Jersey Board of Public Utilities, Docket No. 831-25, concerning outage replacement power costs.
7. **In re: Philadelphia Electric Company**, Pennsylvania Public Utilities Commission, Docket No. P-830453, concerning outage replacement power costs.
8. **In re: Cincinnati Gas & Electric Company**, Public Utilities Commission of Ohio, Case No. 83-33-EL-EFC, concerning the results of an operations/fuel-use audit conducted by Mr. Lanzalotta.
9. **In re: Kansas City Power and Light Company**, before the State Corporation Commission of the state of Kansas, Docket Nos. 142,099-U and 120,924-U, concerning the determination of the capacity, from a new base-load generating facility, needed for reliable system operation, and the capacity available from existing generating units.



**Proceedings In Which  
Peter J. Lanzalotta  
Has Testified**

10. **In re: Philadelphia Electric Company**, Pennsylvania Public Utilities Commission, Docket No. R-850152, concerning the determination of the capacity, from a new base-load generating facility, needed for reliable system operation, and the capacity available from existing generating units.
11. **In re: ABC Method Proposed for Application to Public Service Company of Colorado**, before the Public Utilities Commission of the State of Colorado, on behalf of the Federal Executive Agencies ("FEA"), concerning a production cost allocation methodology proposed for use in Colorado.
12. **In re: Duquesne Light Company**, Docket No. R-870651, before the Pennsylvania Public Utilities Commission, on behalf of the Office of Consumer Advocate, concerning the system reserve margin needed for reliable service.
13. **In re: Pennsylvania Power Company**, Docket No. I-7970318 before the Pennsylvania Public Utilities Commission, on behalf of the Office of Consumer Advocate, concerning outage replacement power costs.
14. **In re: Commonwealth Edison Company**, Docket No. 87-0427 before the Illinois Commerce Commission, on behalf of the Citizen's Utility Board of Illinois, concerning the determination of the capacity, from new base-load generating facilities, needed for reliable system operation.
15. **In re: Central Illinois Public Service Company**, Docket No. 88-0031 before the Illinois Commerce Commission, on behalf of the Citizen's Utility Board of Illinois, concerning the degree to which existing generating capacity is needed for reliable and/or economic system operation.
16. **In re: Illinois Power Company**, Docket No. 87-0695 before the State of Illinois Commerce Commission, on behalf of Citizens Utility Board of Illinois, Governors Office of Consumer Services, Office of Public Counsel and Small Business Utility Advocate, concerning the determination of the capacity, from a new base-load generating facility, needed for reliable system operation, and the capacity available from existing generating units.

**Proceedings In Which  
Peter J. Lanzalotta  
Has Testified**

17. **In re: Florida Power Corporation**, Docket No. 860001-EI-G (Phase II), before the Florida Public Service Commission, on behalf of the Federal Executive Agencies of the United States, concerning an investigation into fuel supply relationships of Florida Power Corporation.
18. **In re: Potomac Electric Power Company**, before the Public Service Commission of the District of Columbia, Docket No. 877, on behalf of the Public Service Commission Staff, concerning the need for and availability of new generating facilities.
19. **In re: South Carolina Electric & Gas Company**, before the South Carolina Public Service Commission, Docket No. 88-681-E, On Behalf of the State of Carolina Department of Consumer Affairs, concerning the capacity needed for reliable system operation, the capacity available from existing generating units, relative jurisdictional rate of return, reconnection charges, and the provision of supplementary, backup, and maintenance services for QFs.
20. **In re: Commonwealth Edison Company**, Illinois Commerce Commission, Docket Nos. 87-0169, 87-0427, 88-0189, 88-0219, and 88-0253, on behalf of the Citizen's Utility Board of Illinois, concerning the determination of the capacity, from a new base-load generating facility, needed for reliable system operation.
21. **In re: Illinois Power Company**, Illinois Commerce Commission, Docket No. 89-0276, on behalf of the Citizen's Utility Board Of Illinois, concerning the determination of capacity available from existing generating units.
22. **In re: Jersey Central Power & Light Company**, New Jersey Board of Public Utilities, Docket No. EE88-121293, on behalf of the State of New Jersey Department of the Public Advocate, concerning evaluation of transmission planning.
23. **In re: Canal Electric Company**, before the Federal Energy Regulatory Commission, Docket No. ER90-245-000, on behalf of the Municipal Light Department of the Town of Belmont, Massachusetts, concerning the reasonableness of Seabrook Unit No. 1 Operating and Maintenance expense.

**Proceedings In Which  
Peter J. Lanzalotta  
Has Testified**

24. **In re: New Hampshire Electric Cooperative Rate Plan Proposal**, before the New Hampshire Public Utilities Commission, Docket No. DR90-078, on behalf of the New Hampshire Electric Cooperative, concerning contract valuation.
25. **In re: Connecticut Light & Power Company**, before the Connecticut Department of Public Utility Control, Docket No. 90-04-14, on behalf of a group of Qualifying Facilities concerning O&M expenses payable by the QFs.
26. **In re: Duke Power Company**, before the South Carolina Public Service Commission, Docket No. 91-216-E, on behalf of the State of South Carolina Department of Consumer Advocate, concerning System Planning, Rate Design and Nuclear Decommissioning Fund issues.
27. **In re: Jersey Central Power & Light Company**, before the Federal Energy Regulatory Commission, Docket No. ER91-480-000, on behalf of the Boroughs of Butler, Madison, Lavallette, Pemberton and Seaside Heights, concerning the appropriateness of a separate rate class for a large wholesale customer.
28. **In re: Potomac Electric Power Company**, before the Public Service Commission of the District of Columbia, Formal Case No. 912, on behalf of the Staff of the Public Service Commission of the District of Columbia, concerning the Application of PEPCO for an increase in retail rates for the sale of electric energy.
29. **Commonwealth of Pennsylvania, House of Representatives**, General Assembly House Bill No. 2273. Oral testimony before the Committee on Conservation, concerning proposed Electromagnetic Field Exposure Avoidance Act.
30. **In re: Hearings on the 1990 Ontario Hydro Demand\Supply Plan**, before the Ontario Environmental Assessment Board, concerning Ontario Hydro's System Reliability Planning and Transmission Planning.

**Proceedings In Which  
Peter J. Lanzaotta  
Has Testified**

31. **In re: Maui Electric Company**, Docket No. 7000, before the Public Utilities Commission of the State of Hawaii, on behalf of the Division of Consumer Advocacy, concerning MECO's generation system, fuel and purchased power expense, depreciation, plant additions and retirements, contributions and advances.
32. **In re: Hawaiian Electric Company, Inc.**, Docket No. 7256, before the Public Utilities Commission of the State of Hawaii, on behalf of the Division of Consumer Advocacy, concerning need for, design of, and routing of proposed transmission facilities.
33. **In re: Commonwealth Edison Company**, Docket No. 94-0065 before the Illinois Commerce Commission on behalf of the City of Chicago, concerning the capacity needed for system reliability.
34. **In re: Commonwealth Edison Company**, Docket No. 93-0216 before the Illinois Commerce Commission on behalf of the Citizens for Responsible Electric Power, concerning the need for proposed 138 kV transmission and substation facilities.
35. **In re: Commonwealth Edison Company**, Docket No. 92-0221 before the Illinois Commerce Commission on behalf of the Friends of Illinois Prairie Path, concerning the need for proposed 138 kV transmission and substation facilities.
36. **In re: Commonwealth Edison Company**, Docket No. 94-0179 before the Illinois Commerce Commission on behalf of the Friends of Sugar Ridge, concerning the need for proposed 138 kV transmission and substation facilities.
37. **In re: Public Service Company of Colorado**, Docket Nos. 95A-531EG and 95I-464E before the Colorado Public Utilities Commission on behalf of the Office of Consumer Counsel, concerning a proposed merger with Southwestern Public Service Company and a proposed performance-based rate-making plan.

**Proceedings In Which  
Peter J. Lanzalotta  
Has Testified**

38. **In re: South Carolina Electric & Gas Company, Duke Power Company, and Carolina Power & Light Company**, Docket No. 95-1192-E, before the South Carolina Public Service Commission on behalf of the South Carolina Department of Consumer Advocate, concerning avoided cost rates payable to qualifying facilities.
39. **In re: Lawrence A. Baker v. Truckee Donner Public Utility District**, Case No. 55899, before the Superior Court of the State of California on behalf of Truckee Donner Public Utility District, concerning the reasonableness of electric rates.
40. **In re: Black Hills Power & Light Company**, Docket No. OA96-75-000, before the Federal Energy Regulatory Commission on behalf of the City of Gillette, Wyoming, concerning the Black Hills' proposed open access transmission tariff.
41. **In re: Metropolitan Edison Company and Pennsylvania Electric Company** for Approvals of the Restructuring Plan Under Section 2806, Docket Nos. R-00974008 and R-00974009 before the Pennsylvania PUC on behalf of Operating NUG Group, concerning miscellaneous restructuring issues.
42. **In re: New Jersey State Restructuring Proceeding** for consideration of proposals for retail competition under BPU Docket Nos. EX94120585U; E097070457; E097070460; E097070463; E097070466 before the New Jersey BPU on behalf of the New Jersey Division of Ratepayer Advocate, concerning load balancing, third party settlements, and market power.
43. **In re: Arbitration Proceeding In City of Chicago v. Commonwealth Edison** for consideration of claims that franchise agreement has been breached, Proceeding No. 51Y-114-350-96 before an arbitration panel board on behalf of the City of Chicago concerning electric system reliability.
44. **In re: Transalta Utilities Corporation**, Application No. RE 95081 on behalf of the ACD companies, before the Alberta Energy And Utilities Board in reference to the use and value of interruptible capacity.

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45. **In re: Consolidated Edison Company**, Docket No. EL99-58-000 on behalf of The Village of Freeport, New York, before FERC in reference to remedies for a breach of contract to provide firm transmission service on a non-discriminatory basis.
46. **In re: ESBI Alberta Ltd.**, Application No. 990005 on behalf of the FIRM Customers, before the Alberta Energy And Utilities Board concerning the reasonableness of the cost of service plus management fee proposed for 1999 and 2000 by the transmission administrator.
47. **In re: South Carolina Electric & Gas Company**, Docket No. 2000-0170-E on behalf of the South Carolina Department of Consumer Affairs before the Public Service Commission of South Carolina concerning an application for a Certificate of Environmental Compatibility and Public Convenience and Necessity for new and repowered generating units at the Urquhart generating station.
48. **In re: BGE**, Case No. 8837 on behalf of the Maryland Office of People's Counsel before the Maryland Public Service Commission concerning proposed electric line extension charges.
49. **In re: PEPCO**, Case No. 8844 on behalf of the Maryland Office of People's Counsel before the Maryland Public Service Commission concerning proposed electric line extension charges.
50. **In re: GenPower Anderson LLC**, Docket No. 2001-78-E on behalf of the South Carolina Department of Consumer Affairs before the Public Service Commission of South Carolina concerning an application for a Certificate of Environmental Compatibility and Public Convenience and Necessity for new generating units at the GenPower Anderson LLC generating station.
51. **In re: Pike County Light & Power Company**, Docket No. P-00011872, on behalf of Pennsylvania Office of Consumer Advocate before the Pennsylvania Public Utility Commission concerning the Pike County request for a retail rate cap exception.

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52. **In re: Potomac Electric Power Company and Conectiv**, Case No. 8890, on behalf of the Maryland Office of People's Counsel before the Maryland Public Service Commission concerning the proposed merger of Potomac Electric Power Company and Conectiv.
53. **In re: South Carolina Electric & Gas Company**, Docket No. 2001-420-E on behalf of the South Carolina Department of Consumer Affairs before the Public Service Commission of South Carolina concerning an application for a Certificate of Environmental Compatibility and Public Convenience and Necessity for new generating units at the Jasper County generating station.
54. **In re: Connecticut Light & Power Company**, Docket No. 217 on behalf of the Towns of Bethel, Redding, Weston, and Wilton, Connecticut before the Connecticut Siting Council concerning an application for a Certificate of Environmental Compatibility and Public Need for a new transmission line facility between Plumtree Substation, Bethel and Norwalk Substation, Norwalk.
55. **In re: The City of Vernon, California**, Docket No. EL02-103 on behalf of the City of Vernon before the Federal Energy Regulatory Commission concerning Vernon's transmission revenue balancing account adjustment reflecting calendar year 2001 transactions.
56. **In re: San Diego Gas & Electric Company et. al.**, Docket No. EL00-95-045 on behalf of the City of Vernon, California before the Federal Energy Regulatory Commission concerning refunds and other monies payable in the California wholesale energy markets.
57. **In re: The City of Vernon, California**, Docket No. EL03-31 on behalf of the City of Vernon before the Federal Energy Regulatory Commission concerning Vernon's transmission revenue balancing account adjustment reflecting 2002 transactions.
58. **In re: Jersey Central Power & Light Company**, Docket Nos. ER02080506, ER02080507, ER02030173, and EO02070417 on behalf of the New Jersey Division of Ratepayer Advocate before the New Jersey Board of Public Utilities concerning reliability issues involved in the approval of an increase in

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base tariff rates.

59. **In re: Proposed Electric Service Reliability Rules, Standards, and Indices To Ensure Reliable Service by Electric Distribution Companies**, PSC Regulation Docket No. 50, on behalf of the Delaware Public Service Commission Staff before the Delaware Public Service Commission concerning proposed electric service reliability rules, standards and indices.
60. **In re: Central Maine Power Company**, Docket No. 2002-665, on behalf of the Maine Public Advocate and the Town of York before the Maine Public Utilities Commission concerning a Request for Commission Investigation into the New CMP Transmission Line Proposal for Eliot, Kittery, and York.
61. **In re: Metropolitan Edison Company**, Docket No. C-20028394, on behalf of the Pennsylvania Office of Consumer Advocate, before the Pennsylvania Public Utility Commission concerning the reliability service complaint of Robert Lawrence.
62. **In re: The California Independent System Operator Corporation**, Docket No. ER00-2019 *et al.* on behalf of the City of Vernon, California, before the Federal Energy Regulatory Commission concerning wholesale transmission tariffs, rates and rate structures proposed by the California ISO.
63. **In re: The Narragansett Electric Company**, Docket No. 3564 on behalf of the Rhode Island Department of Attorney General, before the Rhode Island Public Utilities Commission concerning the proposed relocation of the E-183 transmission line.
64. **In re: The City of Vernon, California**, Docket No. EL04-34 on behalf of the City of Vernon before the Federal Energy Regulatory Commission concerning Vernon's transmission revenue balancing account adjustment reflecting 2003 transactions.
65. **In re: Atlantic City Electric Company**, Docket No. ER03020110 on behalf of the New Jersey Division of Ratepayer Advocate before the New Jersey Board of Public Utilities concerning reliability issues involved in the approval of an increase in base tariff rates.



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66. **In re: Connecticut Light & Power Company and the United Illuminating Company,** Docket No. 272 on behalf of the Towns of Bethany, Cheshire, Durham, Easton, Fairfield, Hamden, Middlefield, Milford, North Haven, Norwalk, Orange, Wallingford, Weston, Westport, Wilton, and Woodbridge, Connecticut before the Connecticut Siting Council concerning an application for a Certificate of Environmental Compatibility and Public Need for a new transmission line facility between the Scoville Rock Switching Station in Middletown and the Norwalk Substation in Norwalk, Connecticut.
67. **In re: Metropolitan Edison Company, Pennsylvania Electric Company, and Pennsylvania Power Company,** Docket No. I-00040102, on behalf of the Pennsylvania Office of Consumer Advocate before the Pennsylvania Public Utility Commission concerning electric service reliability performance.
68. **In re: Entergy Louisiana, Inc.,** Docket No. U-20925 RRF-2004 on behalf of Bayou Steel before the Louisiana Public Service Commission concerning a proposed increase in base rates.
69. **In re: Jersey Central Power & Light Company,** Docket No. ER02080506, Phase II, on behalf of the New Jersey Division of Ratepayer Advocate before the New Jersey Board of Public Utilities concerning reliability issues involved in the approval of an increase in base tariff rates.
70. **In re: Maine Public Service Company,** Docket No. 2004-538, on behalf of the Main Public Advocate before the Maine Public Utilities Commission concerning a request to construct a 138 kV transmission line from Limestone, Maine to the Canadian border near Hamlin, Maine.
71. **In re: Pike County Light and Power Company,** Docket No. M-00991220F0002, on behalf of the Pennsylvania Office of Consumer Advocate before the Pennsylvania Public Utility Commission concerning the Company's Petition to amend benchmarks for distribution reliability.
72. **In re: Atlantic City Electric Company,** Docket No. EE04111374, on behalf of the New Jersey Division of Ratepayer Advocate before the New Jersey

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Board of Public Utilities concerning the need for transmission system reinforcement, and related issues.

73. **In re: Bangor Hydro-Electric Company**, Docket No. 2004-771, on behalf of the Main Public Advocate before the Maine Public Utilities Commission concerning a request to construct a 345 kV transmission line from Orrington, Maine to the Canadian border near Baileyville, Maine.
74. **In re: Eastern Maine Electric Cooperative**, Docket No. 2005-17, on behalf of the Main Public Advocate before the Maine Public Utilities Commission concerning a petition to approve a purchase of transmission capacity on a 345 kV transmission line from Maine to the Canadian province of New Brunswick.
75. **In re: Virginia Electric and Power Company**, Case No. PUE-2005-00018, on behalf of the Town of Leesburg VA and Loudoun County VA before the Virginia State Corporation Commission concerning a request for a certificate of public convenience and necessity for transmission and substation facilities in Loudoun County.
76. **In re: Proposed Electric Service Reliability Rules, Standards, and Indices To Ensure Reliable Service by Electric Distribution Companies**, PSC Regulation Docket No. 50, on behalf of the Delaware Public Service Commission Staff before the Delaware Public Service Commission concerning proposed electric service reliability reporting, standards, and indices.
77. **In re: Proposed Merger Involving Constellation Energy Group Inc. and the FPL Group, Inc.**, Case No. 9054, on behalf of the Maryland Office of Peoples' Counsel before the Maryland Public Service Commission concerning the proposed merger involving Baltimore Gas & Electric Company and Florida Light & Power Company.
78. **In re: Proposed Sale and Transfer of Electric Franchise of the Town of St. Michaels to Choptank Electric Cooperative, Inc.**, Case No. 9071, on behalf of the Maryland Office of Peoples' Counsel before the Maryland Public Service Commission concerning the sale by St. Michaels of their electric franchise and service area to Choptank.

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79. **In re: Petition of Rockland Electric Company for the Approval of Changes in Electric Rates, and Other Relief**, BPU Docket No. ER06060483, on behalf of the Department of the Public Advocate, Division of Rate Counsel, before the New Jersey Board of Public Utilities, concerning electric service reliability and reliability-related spending.
80. **In re: The Complaint of the County of Pike v. Pike County Light & Power Company, Inc.**, Docket No. C-20065942, et al., on behalf of the Pennsylvania Office of Consumer Advocate before the Pennsylvania Public Utilities Commission, concerning electric service reliability and interconnecting with the PJM ISO.
81. **In re: Application of American Transmission Company to Construct a New Transmission Line**, Docket No. 137-CE-139, on behalf of The Sierra Club of Wisconsin, before the Public Service Commission of Wisconsin, concerning the request to build a new 138 kV transmission line.
82. **In re: The Matter of the Self-Complaint of Columbus Southern Power Company and Ohio Power Company Regarding the Implementation of Programs to Enhance Distribution Service Reliability**, Case No. 06-222-EL-SLF, on behalf of The Office of The Ohio Consumers' Counsel, before the Public Utilities Commission of Ohio, concerning distribution system reliability and related topics.
83. **In re: Central Maine Power Company**, Docket No. 2006-487, on behalf of the Maine Public Advocate before the Maine Public Utilities Commission concerning CMP's Petition for Finding of Public Convenience & Necessity to build a 115 kV transmission line between Saco and Old Orchard Beach.
84. **In re: Bangor Hydro Electric Company**, Docket No. 2006-686, on behalf of the Maine Public Advocate before the Maine Public Utilities Commission concerning BHE's Petition for Finding of Public Convenience & Necessity to build a 115 kV transmission line and substation in Hancock County.
85. **In re: Commission Staff's Petition For Designation of Competitive Renewable Energy Zones**, Docket No. 33672, on behalf of the Texas Office

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of Public Utility Counsel, concerning the Staff's Petition and the determination of what areas should be designated as CREZs by the Commission.

86. **In re: Virginia Electric and Power Company**, Case No. PUE-2006-00091, on behalf of the Towering Concerns and Stafford County VA before the Virginia State Corporation Commission concerning a request for a certificate of public convenience and necessity for electric transmission and substation facilities in Stafford County.
87. **In re: Trans-Allegheny Interstate Line Company**, Docket Nos. A-110172 et al., on behalf of the Pennsylvania Office of Consumer Advocate, before the Pennsylvania Public Utility Commission, concerning a request for a certificate of public convenience and necessity for electric transmission and substation facilities in Pennsylvania.
88. **In re: Commonwealth Edison Company**, Docket No. 07-0566, on behalf of the Illinois Attorney General, before the Illinois Commerce Commission, concerning electric transmission and distribution projects promoted as smart grid projects, and the rider proposed to pay for them.
89. **In re: Commonwealth Edison Company**, Docket No. 07-0491, on behalf of the Illinois Attorney General, before the Illinois Commerce Commission, concerning the applicability of electric service interruption provisions.
90. **In re: Hydro One Networks**, Case No. EB-2007-0050, on behalf of Pollution Probe, before the Ontario Energy Board, concerning a request for leave to construct electric transmission facilities in the Province of Ontario.
91. **In re: PEPCO Holdings, Inc.**, Docket No. ER-08-686-000, on behalf of the Maryland Office of Peoples' Counsel, before the Federal Energy Regulatory Commission, concerning a request for incentive rates of return on transmission projects.
92. **In re: PPL Electric Utilities Corporation and Public Service Electric and Gas Company**, Docket No. ER-08-23-000, on behalf of the Joint Consumer Advocates, including the state consumer advocacy offices for the States of

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Maryland, West Virginia, before the Federal Energy Regulatory Commission, concerning a request for incentive rates of return on transmission projects.

93. **In re: PPL Electric Utilities Corporation**, Docket Nos. A-2008-2022941 and P-2008-2038262, on behalf of Springfield Township, Bucks County, PA, before the Pennsylvania Public Utility Commission, concerning the need for and alternatives to proposed electric transmission lines and a proposed electric substation.
94. **In re: PEPCO Holdings, Inc.**, Docket No. ER08-1423-000, on behalf of the Maryland Office of Peoples' Counsel, before the Federal Energy Regulatory Commission, concerning a request for incentive rates of return on transmission projects.
95. **In re: Public Service Electric and Gas Company, Inc.**, Docket No. ER09-249-000, on behalf of the New Jersey Division of Rate Counsel, before the Federal Energy Regulatory Commission, concerning a request for incentive rates of return on transmission projects.
96. **In re: New York Regional Interconnect Inc.**, Case No. 06-T-0650, on behalf of the Citizens Against Regional Interconnect, before the New York Public Service Commission, concerning the economics of and alternatives to proposed transmission facilities.
97. **In re: Central Maine Power Company and Public Service of New Hampshire**, Docket No. 2008-255, on behalf of the Maine Public Advocate, before the Maine Public Utilities Commission, concerning CMP's and PSNH's Petition for Finding of Public Convenience & Necessity to build the Maine Power Reliability Project, a series of new and rebuilt electric transmission facilities to operate at 345 kV and 115 kV in Maine and New Hampshire.
98. **In re: PPL Electric Utilities Corporation**, Docket No. A-2009-2082652 **et al**, on behalf of the Pennsylvania Office of Consumer Advocate, before the Pennsylvania Public Utility Commission, concerning the Company's application for approval to site and construct electric transmission facilities in Pennsylvania.

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99. **In re: Bangor Hydro-Electric**, Docket No. 2009-26, on behalf of the Maine Public Advocate, before the Maine Public Utilities Commission, concerning BHE's Petition for Certificate of Public Convenience & Necessity to build a 115 kV transmission line in Washington and Hancock Counties.
100. **In re: United States, et al. v. Cinergy Corp., et al.** Civil Action No. IP99-1693 C-M/S, on behalf of Plaintiff United States and Plaintiff-Intervenors State of New York, State of New Jersey, State of Connecticut, Hoosier Environmental Council, and Ohio Environmental Council, before the United States District Court for the Southern District of Indiana, concerning the system reliability impacts of the potential retirement of Gallagher Power Station Unit 1 and Unit 3.
101. **In re: Application of Potomac Electric Power Company, et al.** Case No. 9179, on behalf of the Maryland Office of Peoples' Counsel before the Maryland Public Service Commission concerning the application for a determination of need under a certificate of public convenience and necessity for the Maryland portion of the MAPP transmission line, and related facilities.

Public Version

Confidential Information Redacted

***Base Case and Beckjord Coal-Fired Generation Removed***

Entries below show loading in MW and, in parentheses, as a percent of summer normal ratings. Positive flows are from the first location to the second, such as from Pierce to Dearborn in the first entry. Negative numbers indicate a flow from the second location to the first, such as from Dearborn to Pierce in the first entry.

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