

**REPORT OF THE
STATE CORPORATION COMMISSION STAFF**

**Study on Inclusion of
Conservation Efforts in
Transmission Line Applications**

**TO THE GOVERNOR,
SPEAKER OF THE HOUSE, AND
GENERAL ASSEMBLY OF VIRGINIA**



**COMMONWEALTH OF VIRGINIA
RICHMOND
2008**

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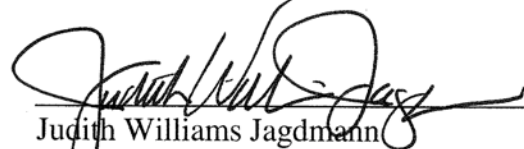
STATE CORPORATION COMMISSION

December 1, 2008

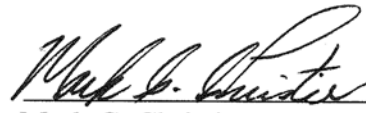
TO: The Honorable Timothy M. Kaine, Governor of Virginia
The Honorable William J. Howell, Speaker of the House
The General Assembly of Virginia

The State Corporation Commission is pleased to submit the Commission Staff's report, regarding the inclusion of conservation efforts in calculations of generation and load demand in electric utility applications for approval to construct high voltage transmission lines, as requested by the House Rules Committee.

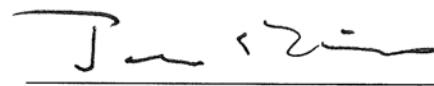
Respectfully Submitted,



Judith Williams Jagdmann
Commission Chairman



Mark C. Christie
Commissioner



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TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY.....	ii
INTRODUCTION.....	1
TRANSMISSION SYSTEM RELIABILITY ASSESSMENT.....	2
STATUTORY REFERENCES.....	4
AUTHORITY PURSUANT TO § 56-46.1 OF THE CODE OF VIRGINIA.....	13
ASSESSMENT OF LOAD FORECAST TREATMENT OF ON-GOING ENERGY CONSERVATION EFFORTS.....	14
CONCLUSIONS AND RECOMMENDATION.....	17
APPENDIX A: HOUSE RULES COMMITTEE REQUEST FOR STUDY.....	19

EXECUTIVE SUMMARY

By letter dated February 11, 2008, the Honorable William J. Howell, Speaker of the House of Delegates of the Virginia General Assembly, forwarded a study request on behalf of the House Rules Committee to the State Corporation Commission (“Commission”). Specifically, the Commission was requested to determine whether and to what extent the calculations of generation and load demand in electric utility applications for approval to construct high voltage transmission lines should include a review of the ongoing conservation efforts set forth in certain Virginia statutes, federal acts, and other official directives. In response, the Commission requested its Staff to perform the study and prepare this report.

Due to the extensive challenges currently associated with the provision of a secure, reliable, and environmentally sensitive energy supply at affordable prices, the federal government and many state governments, including Virginia, have recently established aggressive energy conservation and renewable energy resource goals and strategies. These conservation efforts are expected to play an increasingly important role in meeting the future energy needs of the nation, which raises the study question relative to the appropriate consideration of these resources in the transmission system reliability planning process.

For purposes of the requested study, the Commission Staff specifically focused on whether the load forecasts in transmission line applications should be adjusted by projections of incremental peak load demand reductions associated with the energy conservation efforts stemming from: 1) the Virginia energy conservation goal, and 2) § 102 of the Federal Energy Policy Act of 2005 (“EPAct 2005”) and Title IV, Subtitle C, §§ 431–441 of the Energy Independence and Security Act of 2007 (“EISA”).

Most of the electric utility transmission systems east of the Rocky Mountains in the United States and Canada are interconnected. Therefore, each of these transmission systems is potentially subject to catastrophic impacts arising from disruptions on any of the other interconnected transmission systems. Due to the public interest importance of maintaining reliable electric service across the country, the North American Electric Reliability Corporation establishes and enforces federally mandated electric transmission reliability standards. Such standards include requirements that transmission systems be assessed annually in order to determine system vulnerabilities and needed enhancements with sufficient lead time to implement such solutions.

In making such assessments, it is a standard industry practice to use conservative study assumptions relative to the inclusion of future demand side

management (“DSM”) and generation resources. A reasonable degree of specificity and certainty with respect to the measurability, amount, timing, and location of these resources is typically required. Given that the Speaker’s letter directed the Commission not to make recommendations that would “increase reliability risk of the transmission network,” the Commission Staff believes that a conservative planning approach should be maintained.

At present, there are a number of factors that would make projections of the amounts, timing, and location of future incremental peak demand load reductions associated with Virginia and federal energy conservation efforts highly uncertain and, therefore, lacking the specificity needed for evaluating peak loadings on specific transmission facilities. Among these factors, both the Virginia and federal goals are targeted at energy conservation, as opposed to reducing peak demand, which is the focus of transmission system reliability planning. Additionally, the effort to develop and implement programs to achieve the Virginia energy conservation goal is in its infancy, with DSM pilot programs currently underway to acquire information needed to facilitate such efforts; and the federal energy consumption reduction requirements, also in the implementation process, are applicable to agency total energy usage, not simply electricity usage.

Rather than improving the results of system assessments, the inclusion of such uncertain projections could increase system reliability risk by delaying the timely recognition of needed enhancements and the development and implementation of appropriate solutions. Additionally, the load forecasting process, though not directly adjusting projected load to reflect future incremental levels of DSM, incorporates actual achieved levels of DSM into load forecasts over time; and these forecasts are currently considered in the evaluation of need for new transmission facilities.

Finally, it is important to note that the recently amended § 56-46.1 of the Code of Virginia provides the Commission with the clear statutory authority and responsibility to verify the reasonableness of load flow studies and contingency analyses presented by applicants to justify new transmission line proposals. In accordance with this authority and responsibility, the Commission specifically considers the reasonableness of such studies presented in transmission line applications, including the load forecast and generation resource assumptions. Should these studies or their underlying assumptions fall short of the reasonableness standard, the Commission may take appropriate corrective action.

For the reasons described above, the Commission Staff makes no recommendation for legislative action in this report.

INTRODUCTION

By letter dated February 11, 2008,¹ the Honorable William J. Howell, Speaker of the House of Delegates of the Virginia General Assembly, forwarded a study request on behalf of the House Rules Committee to the State Corporation Commission (“Commission”). Specifically, the Commission was requested to determine whether and to what extent the calculations of generation and load demand in electric utility applications for approval to construct high voltage transmission lines should include a review of the ongoing conservation efforts set forth in: 1) §§ 56-235.1 and 56-585.2 of the Code of Virginia; 2) the provisions of Title I, Subtitle A, § 102 of the Federal Energy Policy Act of 2005 (“EPAAct 2005”) and Title IV, Subtitle C, §§ 431–441 of the Energy Independence and Security Act of 2007 (“EISA”), to the extent federal buildings subject thereto located in the Commonwealth can be identified; and 3) such other applicable federal or state statutes, regulations, executive orders, or other binding requirements concerning energy conservation, demand management or response, or distributed generation as the Commission may deem appropriate and necessary (“Study Request”).

The Commission was requested to submit a written report of its findings and any recommendations to the 2009 Session of the General Assembly, and directed to ensure that any recommendation regarding the review of conservation measures shall not i) delay review of an application by the Commission; ii) increase reliability risk of the transmission network; or iii) violate federal regulations under the jurisdiction of the Federal Energy Regulatory Commission or the North American Electric Reliability Corporation.

In response to the Speaker’s letter, the Commission requested its Staff to perform the requested study and prepare this report. The following sections of the report include: 1) a contextual overview of transmission system reliability assessment; 2) a summary of the Virginia statutes and federal acts referenced in the Study Request; 3) a review of Commission authority pursuant to § 56-46.1 of the Code of Virginia relative to the consideration of load flow and contingency analysis studies presented in transmission line applications; 4) the Commission Staff’s assessment of the appropriate load forecast treatment of energy savings anticipated as a result of the Virginia energy conservation goal and federal agency energy consumption reductions required by EPAAct 2005 and EISA; and 5) the Commission Staff’s conclusions and recommendations.

¹ Copy included as Appendix A.

TRANSMISSION SYSTEM RELIABILITY ASSESSMENT

Public policy in the United States has long recognized the importance of a reliable electric system. The reliable supply of electricity is essential to maintaining a stable and growing economy and to providing essential health, safety and welfare benefits with respect to the general public's standard of living.

The three functional components of the electric system are generation, transmission, and distribution. Electricity is generated from raw fuel or other energy sources at power plants that are connected to and feed the transmission system. Bulk power flows across high-voltage transmission lines to load centers where substations step-down the voltage for delivery of electricity over lower-voltage distribution lines to end use consumers. While each component plays an important role in the reliable provision of electric service, the issues addressed in this report directly relate to transmission system reliability planning.

As part of the Eastern Interconnection, the transmission systems of utilities serving Virginia, including Allegheny Power, American Electric Power, Dominion Virginia Power, and Kentucky Utilities, are interconnected, directly or indirectly with all other utility transmission systems in the United States and Canada between the Rocky Mountains and the Atlantic coast, excluding Quebec and most of Texas. Consistent with Virginia law requiring membership in a regional transmission entity,² the State's investor-owned electric utilities, with the exception of Kentucky Utilities, are members of PJM Interconnection, LLC ("PJM"), a large regional transmission organization ("RTO"). PJM plans, with the substantial participation of its transmission-owning members, and operates the transmission systems of its members. PJM also administers competitive wholesale energy, capacity, and ancillary service markets within its regional footprint.

Because all the transmission systems within the Eastern Interconnection are interconnected, each transmission system is potentially subject to catastrophic impacts arising from disruptions on the other interconnected transmission systems. Consequently, the North American Electric Reliability Corporation is authorized by law to establish and enforce federally mandated electric transmission reliability standards. Such standards include requirements that transmission systems be assessed annually for a near-term planning horizon (one to five years) and a longer-term horizon (six to ten years). These performance assessments require complex computer simulations to determine system vulnerabilities and enhancements needed to maintain system stability and facility operation within rated thermal and voltage limitations under projected peak loading conditions. The assessments include analysis of the impacts of various key facility outages, or

² Section 56-579 of the Code of Virginia.

contingencies. The assessments, frequently referred to as load flow and contingency analysis studies, are required to ensure that adequate lead time is available to secure the necessary approvals and to construct needed enhancements to maintain a reliable system. In order to demonstrate the need for a proposed transmission line, as required by § 56-46.1 of the Code of Virginia, the results of these studies are generally presented in the testimony accompanying the transmission line application filed with the Commission.

In addition to the electrical layout and technical parameters of transmission system facilities, projected loads (electricity leaving the transmission system) and generation (electricity entering the transmission system) are key assumptions for the computer simulations. The electrical location of projected loads and generation significantly impacts the anticipated loading of specific transmission facilities, and therefore, is critical to the validity of the outcome of the performance assessment studies.

Due to the importance of maintaining transmission system reliability, and the lead time required for implementing required enhancements, it is a standard industry practice to employ a conservative approach regarding calculations of future generation resources or demand reductions to forecasted load that are beyond the control of the RTO or the transmission-owning utility. A reasonable degree of specificity with respect to the measurability, amount, timing, and location of these resources is typically required.

With respect to the transmission system assessments of PJM and its Virginia transmission-owning members, new and existing generating resources typically have been included in the studies to the extent these generators have executed PJM Interconnection Service Agreements (“ISAs”).³ Projected loads typically have not been reduced directly for new or increased levels of demand side management (“DSM”) resources.⁴ It is important to note, however, that the PJM load forecasting process employs an econometric model which projects load based on historic relationships between actual metered loads and key economic, weather, and other variables. Accordingly, load forecasts inherently reflect the actual achieved DSM resource levels, including the impacts of energy conservation programs.

³ PJM has stated that its intent moving forward is to include new and existing generation resources that have completed Facility Study Agreements and that have cleared the PJM RPM capacity auction.

⁴ PJM has informed the Commission Staff that it intends to seek Federal Energy Regulatory Commission approval to allow Energy Efficiency resources to participate in its RPM capacity auctions beginning in May of 2009. It is unclear at this time as to whether and how such committed resources would be included in load forecasts.

STATUTORY REFERENCES

The Study Request references certain Virginia statutes and federal acts with respect to the establishment of energy conservation and renewable energy goals or requirements. Specifically, these include the following.

Section 56-235.1 of the Code of Virginia

One of the referenced Virginia statutes, § 56-235.1 of the Code of Virginia, provides:

It shall be the duty of the Commission to investigate from time to time the acts, practices, rates or charges of public utilities so as to determine whether such acts, practices, rates or charges are reasonably calculated to promote the maximum effective conservation and use of energy and capital resources used by public utilities in rendering utility service. Where the Commission finds that the public interest would be served, it may order any public utility to eliminate, alter or adopt a substitute for any act, practice, rate or charge which is not reasonably calculated to promote the maximum effective conservation and use of energy and capital resources used by public utilities in providing utility service and it may further provide for the dissemination of information to the public, either through the Commission staff or through a public utility, in order to promote public understanding and cooperation in achieving effective conservation of such resources; provided, however, that nothing in this section shall be construed to authorize the adoption of any rate or charge which is clearly not cost-based or which is in the nature of a penalty for otherwise permissible use of utility services.

A number of Commission activities have historically been responsive to this requirement. For example, such activities have included the review of utility integrated resource plans, the establishment of competitive bidding rules for incremental generation needs, and the formal consideration of DSM programs, time-of-use rates, real time pricing, and interruptible rates.

In recent years, significantly fewer activities of this nature were undertaken, as the Virginia Electric Utility Restructuring Act envisioned market prices driving the efficient consumption of electric energy as well as the construction of optimal generating facilities. With the re-regulation of the electric industry in Virginia

pursuant to Chapter 933 of the 2007 Acts of the General Assembly⁵ (“Chapter 933”), however, many of these activities are beginning to resume. For example, legislation⁶ enacted in the 2008 Session of the General Assembly requires each Virginia electric utility to file an initial integrated resource plan with the Commission no later than September 1, 2009, and an updated plan every two years thereafter. The utilities are specifically directed to recommend plans that, among other things, reduce load and demand growth through cost-effective demand reduction programs.

Of particular relevance to the Study Request, Chapter 933 legislatively adopts the 2007 Virginia Energy Plan’s conservation goal of reducing the consumption of electric energy by retail customers by 10 percent of 2006 levels by 2022, or roughly 10 million megawatt-hours. Specifically, the third enactment clause of SB 1416 states in part:

That it is in the public interest, and is consistent with the energy policy goals in § 67-102 of the Code of Virginia, to promote cost-effective conservation of energy through fair and effective demand side management, conservation, energy efficiency, and load management programs, including consumer education. These programs may include activities by electric utilities, public or private organizations, or both electric utilities and public or private organizations. The Commonwealth shall have a stated goal of reducing the consumption of electric energy by retail customers through the implementation of such programs by the year 2022 by an amount equal to ten percent of the amount of electric energy consumed by retail customers in 2006.

The third enactment clause also directed the Commission to conduct a proceeding to determine, among other things, whether the stated goal was achievable. By letter dated December 14, 2007, the Commission transmitted a Staff Report responding to this legislative directive. The report of the Commission Staff found that the stated energy conservation goal is achievable.

On September 18, 2007, Dominion Virginia Power filed with the Commission an application requesting expedited approval to implement nine pilot programs designed to test various aspects of energy conservation, energy efficiency, customer education, demand response, and/or load management. The

⁵ Chapter 933 (“SB 1416”) amends and reenacts §§ 56-233.1, 56-234.2, 56-235.2, 56-235.6, 56-249.6, 56-576 through 56-581, 56-582, 56-584, 56-585, 56-587, 56-589, 56-590, and 56-594 of the Code of Virginia; amends the Code of Virginia by adding sections numbered 56-585.1, 56-585.2, and 56-585.3; and repeals §§ 56-581.1 and 56-583 of the Code of Virginia, relating to the regulation of electric utility service.

⁶ Chapter 24 of Title 56 of the Code of Virginia, §§ 56-597 *et seq.*

Commission approved the pilot programs application on January 17, 2008, finding that the pilots “are necessary in order to acquire information which is or may be in furtherance of the public interest, specifically how the Commonwealth’s goal of reducing energy demand by 10% by 2022 may be reached.”

Section 56-585.2 of the Code of Virginia

This section of the Virginia Code establishes a renewable energy portfolio standard program, in which the full implementation of the program is intended to result in twelve percent of the energy sold in 2007 (excluding nuclear) coming from renewable resources by 2022. A rough calculation indicates that this would require generation of approximately 8.2 million megawatt-hours coming from renewable resources by that date. The program provides for a performance incentive of 50 basis points to the authorized return on equity for achieving specified benchmarks to encourage the voluntary participation of Virginia’s investor-owned incumbent electric utilities in this program. As of November 1, 2008, one Virginia utility, Appalachian Power Company, has applied and been approved for participation in the program.

With respect to renewable generation resources, the impact on the need for transmission lines is difficult to gauge. For example, if the renewable generation is remote to load centers, flows on the transmission network could actually increase, perhaps significantly, potentially increasing the need for additional transmission facilities. On the other hand, if such generation is located within load centers, network flows could be reduced, potentially reducing the need for additional lines. Then again, if such generation is typically not available or severely restrained during peak transmission loading periods due to its fuel source (e.g., wind), there may be little or no impact on transmission flows and the need for new facilities. In any event, the appropriate timing of the inclusion of projected renewable generation resources in calculations of generation for purposes of transmission system performance assessment would be in accordance with the guidelines established for inclusion of all other generation resources.

Section 102 of the EPC Act 2005

The National Energy Conservation Policy Act ("NECPA") was enacted by Congress in 1978 as part of the National Energy Act. See 42 U.S.C. §§ 8201 *et seq.* (2006). The legislation was inspired by the energy crisis of the mid-1970s. The purposes of NECPA are "to provide for the regulation of interstate commerce, to reduce the growth in demand for energy in the United States, and to conserve nonrenewable energy resources produced in this Nation and elsewhere, without inhibiting beneficial economic growth." 42 U.S.C. § 8201(b) (2006).

Sections 101 through 104 of EPAct 2005 amend Part 3 of Title V of NECPA.⁷ Section 102 of the Energy Policy Act ("Section 102") describes energy management requirements.⁸ In Section 102(a), which amends subsection (a) of Section 543 of NECPA, energy reduction goals were established. Congress set 2003 as the baseline year for calculating energy savings for federal buildings and stated that each agency shall apply "energy conservation measures to, and shall improve the design for the construction of, the Federal buildings of the agency (including each industrial or laboratory facility) so that the energy consumption for each gross square foot of the Federal buildings of the agency for fiscal years 2006 through 2015 is reduced" incrementally according the following chart:

Fiscal Year	Percentage Reduction
2006	2
2007	4
2008	6
2009	8
2010	10
2011	12
2012	14
2013	16
2014	18
2015	20

As an incentive to achieve this target, Section 102(e), which amends subsections (a) and (b) of Section 543 of NECPA, provides that federal agencies can retain funds allocated for energy expenses that are not incurred because of energy and water conservation. However, the agencies can use these savings only for energy efficiency, water conservation, or unconventional and renewable energy resources projects.

Section 102(b), which amends Section 543(c) of NECPA, states that an agency may exclude any federal building, or collection of federal buildings, from energy performance requirements and energy management requirements if the head of the agency finds that (i) compliance with those requirements would be impracticable; (ii) the agency has completed and submitted all federally required energy management reports; (iii) the agency has achieved compliance with the

⁷ NECPA has also previously been amended by several other acts, including, but not limited to, the Energy Policy and Conservation Act Amendments of 1985, Pub. L. No. 99-58 (1985); the Federal Energy Management Improvement Act of 1988, Pub. L. No. 100-615 (1988); and the Energy Policy Act of 1992, Pub. L. No. 102-486 (1992).

⁸ As the State Corporation Commission was asked to specifically look at Section 102 of the Energy Policy Act ("Section 102"), that section is the only one that will be described in detail here.

energy efficiency requirements of this Act, the Energy Policy Act of 1992, Executive orders and all other federal law, and (iv) the agency has implemented all practicable, life-cycle cost-effective projects with respect to the federal building or collection of federal buildings to be excluded. A finding of impracticability under Section 102(b) shall be based on (i) the energy intensiveness of activities carried out in the federal building or collection of federal buildings; or (ii) the fact that the federal building or collection of federal buildings is used in the performance of a national security function. Section 102(b) further states that the Secretary of Energy shall issue guidelines that establish criteria for exclusions not later than 180 days after the enactment of the section.

Finally, Congress directs, in Section 102(a)(3), that not later than December 31, 2013, the Secretary of Energy is to review the results of the implementation of the energy performance requirements and recommend new target reductions in energy consumption for "each of fiscal years 2015 through 2024."

Sections 431–441 of EISA

In addition to creating new requirements for High-Performance Federal Buildings, §§431 through 441 of EISA amend §§543 and 544 of the NECPA and §305 of the Energy Conservation and Production Act ("ECPA").⁹ The stated purpose of the EISA is "to move the United States toward greater energy independence and security...to improve the energy performance of the Federal Government...."¹⁰

Sections 431 through 441 fall under the subsection entitled "High-Performance Federal Buildings" and establish requirements and procedures for obtaining the goals announced in the NECPA and the ECPA. Additionally, the EISA establishes new energy efficiency requirements not contemplated in either of the other Acts.

The following summary of the provisions of EISA will first address the four sections that amend the NECPA (§§431, 432, 434, 441). It will then address the section that amends the ECPA (§§433), and finally it will address the sections that are new (§§435, 436, 437, 438, 439, and 440).

⁹ The Energy Conservation and Production Act ("ECPA") was passed in 1976 to increase domestic energy supplies and availability, to restrain energy demand, to prepare for energy emergencies, and for other purposes. In 1978, portions of the ECPA were amended by NECPA.

¹⁰ 110 P.L. 140 (later codified at 42 U.S.C.S. 17001, *et seq.*)

AMENDMENTS TO THE NECPA

Section 431. Energy Reduction Goals for Federal Buildings

This section replaces the energy reduction targets established for federal buildings in the Energy Policy Act of 2005 with more aggressive energy reduction goals, subject to the same exemptions. It requires federal building energy consumption per gross square foot in FY2006 through 2015 be reduced incrementally, using 2003 as the base year, according to the following chart:

Fiscal Year	Percentage Reduction
2006	2
2007	4
2008	9
2009	12
2010	15
2011	18
2012	21
2013	24
2014	27
2015	30

Section 432. Management of Energy and Water Efficiency in Federal Buildings

This section amends the NECPA in that it adds an entire subsection to the end of §543 of the NECPA. Along with definitions, this amendment adds the requirement that each federal agency shall designate an energy manager responsible for implementing this subsection and reducing energy use at each covered facility.

This section also requires the energy managers to (1) complete an energy and water evaluation for approximately 25% of the covered facilities within 180 days of the date of enactment of this subsection (date of enactment is December 19, 2007) and (2) identify and assess recommissioning measures for each facility.

In addition, this section provides for many other substantive and procedural requirements of implementing the program (none of which are relevant for the purposes of this discussion).

Section 434. Management of Federal Building Efficiency

The first provision of this section amends the NECPA in that it adds an entire subsection to the end of §543 of the NECPA. The subsection addresses large capital energy investments and requires that any such improvement employ the most energy efficient designs, etc. that are life-cycle cost effective.

The second provision amends §543(e)(1) by inserting verbiage related to equivalent metering of natural gas and steam by October 1, 2016.

Section 441. Public Building Life-Cycle Costs

This section amends §544 of the NECPA and changes the life-cycle cost calculation from 25 years to 40 years.

AMENDMENTS TO THE ECPA

Section 433. Federal Building Energy Efficiency Performance Standards

This section adds a new subparagraph to the ECPA. Based on a comparison of the energy consumption by a similar building in 2003, the fossil fuel-generated energy consumption of new federal buildings and federal buildings undergoing major renovations must be reduced incrementally by the percentages listed in the following chart¹¹:

Fiscal Year	Percentage Reduction
2010	55
2015	65
2020	80
2025	90
2030	100

SECTIONS THAT DO NOT AMEND PRIOR ACTS

Section 435. Leasing

This section provides that beginning December 19, 2010, no federal agency shall enter into a lease for a building that has not earned an Energy Star label. There are also exceptions listed that provide for an agency to enter into a lease for a building that has not received an Energy Star label within the last year, so long

¹¹ There are provisions in this section that allow for exemptions or leniency under certain circumstances approved by the Secretary.

as, within a year of signing the lease, the building is renovated to be energy efficient in a cost-effective manner (taking into consideration the cost and the life of the lease).

Section 436. High-Performance Green Federal Buildings

This section requires the General Services Administration (“GSA”) to establish an Office of Federal High-Performance Green Buildings to coordinate green building information and activities within the GSA and with other federal agencies. The Office must also develop standards for federal facilities, establish green practices, review budget and life-cycle costing issues, and promote demonstration of innovative technologies.¹²

Section 437. Federal Buildings Performance

This section directs the Government Accountability Office (“GAO”) to audit the implementation of activities required under this subtitle. The audit must cover budget, life-cycling costing, contracting, best practices, and agency coordination.¹³

Section 438. Storm Water Runoff Requirements for Federal Development Projects

This section requires that any federal agency development project with a footprint that exceeds 5,000 square feet to incorporate site planning and maintenance strategies to control storm water runoff.

Section 439. Cost-Effective Technology Acceleration Program

This section defines certain terms and directs the GSA to establish a program to accelerate the use of more cost-effective technologies and practices at GSA facilities. It further requires that the manager responsible for implementing the plan at each facility submit a report to Congress regarding implementation of the plan.

Section 440. Authorization of Appropriations

This section authorizes \$4,000,000 for each FY2008–2012 to carry out §§434–439 and 482.

¹² CRS Report to Congress, Energy Independence and Security Act of 2007: Summary of Major Provisions, December 21, 2007.

¹³ *Id.*

Other Applicable Federal or State Statutes, Regulations, Executive Orders, or Other Binding Requirements

The Commission Staff is not aware of other federal or Virginia statutes, regulations, executive orders,¹⁴ or other binding requirements regarding demand reduction or energy conservation that would significantly impact projected transmission system loads or resources within the relative short-term planning horizon (generally five years, or less) underlying proposed transmission lines.

Due to: 1) the physics governing electricity flows across interconnected transmission systems; 2) the dependence of reliable Virginia service on certain key transmission facilities in neighboring states; and 3) PJM's focus on optimizing the regional aspects of its member-owned transmission systems, the condition and any needed enhancements of transmission facilities in Virginia are impacted by the loads, generation, and transmission facilities in neighboring states. Accordingly, it is appropriate to report that several states within the PJM footprint, similarly to Virginia, have recently enacted legislation or published energy plans with very aggressive energy conservation requirements or goals. For example, in the spring of 2008, Maryland passed legislation that calls for a 15 percent reduction in electric usage, per capita, over the next seven years. More recently, in October of 2008, Pennsylvania passed legislation requiring utilities to reduce annual electricity usage beginning in 2011, and New Jersey unveiled an energy plan calling for a 20 percent reduction in energy use over 12 years. Equally important, however, these laws and plans do not detail specific programs to achieve the targeted energy conservation goals; nor, with the exception of Pennsylvania, do the goals specifically target peak load demand reductions.

¹⁴ On April 5, 2007, the Governor of Virginia issued Executive Order 48 that directed executive branch agencies and institutions to reduce energy consumption and costs within the executive branch, setting a goal to reduce the annual cost of non-renewable energy purchases by at least 20 percent of fiscal year 2006 expenditures by fiscal year 2010. The Executive Order also directed several energy efficiency measures and standards relative to new construction and renovation of certain state-owned facilities, new leases on facilities, transportation energy use, and the purchase of appliances and equipment.

AUTHORITY PURSUANT TO § 56-46.1 OF THE CODE OF VIRGINIA

With respect to the required Commission approval of transmission lines of 138 kV or more, recently amended § 56-46.1 B of the Code of Virginia states in part:

As a condition to approval the Commission shall determine that the line is needed and that the corridor or route the line is to follow will reasonably minimize adverse impact on the scenic assets, historic districts and environment of the area concerned. In making the determinations about need, corridor or route, and method of installation, the Commission shall verify the applicant's load flow modeling, contingency analyses, and reliability needs presented to justify the new line and its proposed method of installation. [emphasis added]

The Commission has the statutory authority and responsibility to determine the reasonableness of load flow studies and contingency analyses presented by applicants to justify new transmission line proposals. This authority logically extends to consideration of the appropriateness of the key assumptions included in such studies, including calculations of projected load (which may be affected by DSM programs and conservation) and generation.

ASSESSMENT OF LOAD FORECAST TREATMENT OF ON-GOING ENERGY CONSERVATION EFFORTS

Virginia Energy Conservation Goal

Virginia's electric utilities, as well as the national electric utility industry in general, currently face major challenges. Generation capacity and transmission infrastructure are needed to meet growing load; raw energy prices and the construction costs of new generation are exceptionally high by historical standards; and major environmental concerns exist with respect to traditional generation fired by fossil fuels. Given this environment, Virginia's Governor and General Assembly have established aggressive goals for cost-effective energy conservation and renewable generation resources to help Virginia meet its future electric needs. As previously noted, several other states likewise are establishing aggressive goals to increase DSM and renewable resources.

Similar to the circumstances in many of these states, the implementation of this new strategy within Virginia is in its infancy, with DSM pilot programs currently underway to acquire information needed to facilitate such efforts. While there is general consensus regarding the appropriateness of this policy and its technical achievability, there are virtually no currently established energy conservation programs in Virginia (of the scale needed to achieve the goals) with proven track records relative to needed market penetrations and cost-effectiveness. In fact, prudently inherent in the long timeframe provided for achieving the energy conservation goal (by 2022, or roughly 14 years) is the realistic recognition that the development of cost-effective programs, consumer education, and market penetration and maintenance will require significant effort and time. As such, Virginia's electric utilities will obviously play an important role in the design and implementation of specific energy conservation programs; but this involvement does not resolve the basic issues of uncertainty that accompany the initiation of a major new strategy.

Contributing to this uncertainty relative to the amount, timing, and location of program benefits is the ultimate dependency of such benefits on the interest, voluntary participation, and on-going energy consumption decisions of end-use consumers. Further, when benefits are in fact realized in terms of reduced annual electric consumption, there is no assurance that a proportional reduction in peak demand will be realized since the conservation goal targets annual energy savings as opposed to reductions in peak demand. Therefore, the Commission Staff believes that the inclusion of such adjustments in the load forecast at the present time for purposes of the critically important function of transmission reliability planning, including the evaluation of peak loading on specific transmission facilities, would be premature. Rather than improving the results of system

assessments, the inclusion of such uncertain adjustments possibly could increase system reliability risk by delaying the timely recognition of needed enhancements and the development and implementation of appropriate solutions. Additionally, as noted previously, the PJM load forecasting process, though not directly adjusting projected load for anticipated incremental DSM benefits, incorporates actual achieved levels of DSM into load forecasts over time.

It must also be recognized that, assuming normal levels of economic activity, Virginia peak demand will continue to grow and require additional infrastructure, even with successful progress toward achieving the Virginia energy conservation goal. For example, the 2008 PJM load forecast projects annual compounded growth in peak load of 1.7 percent for the Dominion zone through the year 2012. If that growth rate is extended through 2022 and the arbitrary assumption is made that a proportionate reduction in peak demand will accompany targeted energy savings from the Virginia energy conservation goal (i.e., a reduction in 2022 peak load by 10 percent of the 2006 peak load, or 1,938 MW for the Dominion zone – a yearly average of 138 MW of incremental peak load reduction for 14 years), annual compounded peak load growth would be reduced to 1.1 percent, a reduction of approximately 35 percent. Under these assumptions, peak demand load in 2022 would still increase by approximately 3,200 MW.

Finally, it is important to note that the facilities proposed in transmission line applications typically have planned in-service dates within five years. Given the relatively low current levels of DSM as compared to overall load, even if load forecasts were adjusted for a projection of incremental DSM peak demand reductions, properly adjusted for the significant level of associated uncertainty, such projections may not have a significant impact on the need for new utilities due to the relatively short planning horizon. At best, facilities might be delayed for a short period of time, perhaps a year or two. In other words, such risk adjusted projections may very well be within the load forecast margin of error, and overshadowed by forecast deviations attributable to cyclical economic activity or swings in yearly weather patterns.

EPAct 2005 and EISA

The Commission Staff believes that projections of incremental peak demand load reductions based on the energy consumption reduction requirements (30 percent by 2015 relative to 2003 consumption) as specified by EPAct 2005 and EISA would also be highly uncertain with respect to amount, timing, and location. Accordingly, it would be difficult to reasonably incorporate such projections into load forecasts for purposes of transmission system reliability planning.

Several aspects of EPOA 2005 and EISA contribute to the uncertainties with respect to the potential impact on peak demand load, including the following:

- The energy reduction requirements apply to all energy forms, including electricity, fuel oil, natural gas, LNG / propane, coal, purchased steam, and other. As of 2005, less than half the total energy usage of federal agencies, on a BTU basis, was electricity. The near achievement of the previous energy consumption reduction requirements for federal agencies pursuant to the President's June 3, 1999 Executive Order 13123, that in part required a 30 percent reduction by 2005 relative to 1985, appears to have been achieved primarily through reductions in fuel oil and natural gas usage.
- The energy reduction requirements are stated in terms of energy consumption for each gross square foot of the federal agency. Accordingly, with expansion, an agency could meet its reduction target and still use more total energy. Additionally, certain buildings within an agency may be able to contribute substantially more than others in targeting the required energy reductions.
- Penalties are not assessed for an agency failing to meet its energy reduction requirements.
- Exemptions from the energy reduction requirements are provided to federal buildings or collection of buildings, assuming implementation of all cost-effective energy projects, based on impracticality due to energy intensiveness or performance of a national security function.

While all federal facilities in Virginia (in excess of 2,000 accounts) can probably be identified, surveying each facility for both current and planned electric energy conservation efforts would be impractical with respect to both cost and time. Additionally, since load flows on interconnected neighboring systems can significantly impact one another, undertaking such an exercise in Virginia would be of limited value unless all federal facilities within the PJM system were surveyed, especially those in Washington D.C. and Maryland that are electrically close to Virginia. Further, examining energy conservation efforts at this end-user level of granularity would be inconsistent with the aggregated methodology employed by PJM to forecast loads, including new and expanded load additions.

CONCLUSIONS AND RECOMMENDATION

The Commission Staff concludes the following:

- Given that the Speaker’s letter directed the Commission not to make recommendations that would “increase reliability risk of the transmission network,” a conservative approach to transmission system reliability planning should be maintained.
- Both the Virginia energy conservation goal and the federal EAct 2005 and EISA energy consumption reduction programs are targeted at annual energy savings, as opposed to peak demand reduction, which is the focus of the transmission system reliability planning.
- The effort to develop and implement cost-effective programs to achieve the Virginia energy conservation goal is in its infancy, with DSM pilot programs currently underway to acquire information needed to facilitate such efforts. The ultimate success of these programs, however, will largely depend on the voluntary participation and ongoing decisions of end-use consumers.
- The EAct 2005 and EISA energy consumption reduction requirements target federal agency total energy usage, not just electricity, with exemptions based on energy intensive activities or the performance of a national security function.
- At present, projections of the amount, timing and location of future incremental peak demand load reductions attributable to conservation efforts stemming from the Virginia energy conservation goal or the energy consumption reduction requirements of EAct 2005 and EISA would be highly uncertain. Therefore, such projections would lack the specificity needed for evaluating peak loadings on specific transmission facilities.
- The inclusion of projections of uncertain conservation impacts in load forecasts could increase system reliability risk by delaying the timely recognition of needed transmission enhancements and the development and implementation of appropriate solutions.
- The PJM load forecasting process, though not directly adjusting projected load to reflect future incremental levels of DSM, incorporates actual achieved levels of DSM into load forecasts over time.

- Section 56-46.1 of the Code of Virginia provides the Commission with the clear statutory authority and responsibility to determine the reasonableness of load flow studies and contingency analyses presented by applicants to justify new transmission line proposals, including underlying calculations of projected load and generation. Should such studies or their underlying assumptions fall short of the reasonableness standard, the Commission may take appropriate corrective action.

For the reasons discussed above, the Commission Staff makes no recommendation for legislative action in this report.

APPENDIX A
HOUSE RULES COMMITTEE REQUEST FOR STUDY



COMMONWEALTH OF VIRGINIA
HOUSE OF DELEGATES
RICHMOND

STATE CORPORATION COMMISSION
RECEIVED
FEB 14 2008
Clerk's Office

WILLIAM J. HOWELL
SPEAKER

SPEAKER'S ROOM
STATE CAPITOL
POST OFFICE BOX 406
RICHMOND, VIRGINIA 23218

TWENTY-EIGHTH DISTRICT

COMMITTEE ASSIGNMENT:
RULES (CHAIRMAN)

February 11, 2008

The Honorable Joel H. Peck, Clerk
State Corporation Commission
1300 E. Main Street, First Floor
Richmond, VA 23218

Re: House Rules Committee Request for Study

Dear Mr. Peck:

During the 2008 Session of the General Assembly, the House Committee on Rules considered House Resolution 8, patroned by Del. Clifford L. Athey, Jr. House Resolution 8 was not reported. However, the House Rules Committee believes that certain of the issues addressed by the resolution merit further study. In particular, the House Rules Committee requests that the State Corporation Commission undertake a study to determine whether and to what extent the calculations of generation and load demand in electric utility applications for approval to construct high voltage transmission lines should include a review of the ongoing conservation efforts set forth in: 1) §§ 56-235.1 and 56-585.2 of the Code of Virginia; 2) the provisions of Title I, Subtitle A, § 102 of the Federal Energy Policy Act of 2005 and Title IV, Subtitle C, §§ 431-441 of the Energy Independence and Security Act of 2007, to the extent federal buildings subject thereto located in the Commonwealth can be identified; and 3) such other applicable federal or state statutes, regulations, executive orders, or other binding requirements concerning energy conservation, demand management or response, or distributed generation as the Commission may deem appropriate and necessary.

The State Corporation Commission is requested to submit a written report of its findings and any recommendations to the 2009 Session of the General Assembly. The Commission is further requested to ensure that any recommendation for review of such conservation measures shall not operate (i) to delay review of an application by the Commission; (ii) to increase reliability risk of the transmission network; or (iii) to violate federal regulations under the jurisdiction of the Federal Energy Regulatory Commission

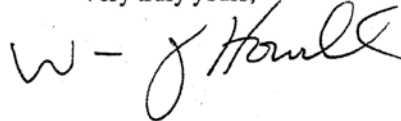
PHONE: (804) 698-1510 • FAX: (804) 698-1801

The Honorable Joel H. Peck, Clerk
State Corporation Commission
February 11, 2008
Page 2

or the North American Electric Reliability Corporation. Please note that this study request expires at the end of the 2008 legislative year.

Thank you for your assistance and cooperation in this matter.

Very truly yours,

A handwritten signature in black ink, appearing to read "W - J Howell". The signature is written in a cursive, somewhat stylized font.

William J. Howell
Speaker of the House

cc: The Honorable Mark C. Christie
The Honorable Judith Williams Jagdmann