Attachment III

UNITED STATES OF AMERICA BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

New York Independent System Operator, Inc.) Docket No. ER12-360-001

AFFIDAVIT OF CHRISTOPHER D. UNGATE

Mr. Christopher D. Ungate declares:

1. I have personal knowledge of the facts and opinions herein and if called to testify could and would testify competently hereto.

I. Purpose of this Affidavit

 The purpose of this Affidavit is to support the New York Independent System Operator, Inc.'s (the "NYISO") proposed revised definition of "Commenced Construction" that is included in the "Further Compliance Filing" to which this Affidavit is attached.

II. Qualifications

- 3. I am a Senior Principal Management Consultant with Sargent & Lundy LLC ("Sargent & Lundy" or "S&L") and have over thirty years of experience in electric utility operations, planning, and consulting. Prior to joining S&L in 2006, my professional work experience included management of generation resource planning for a 30,000 megawatt ("MW") portfolio of nuclear, coal, hydro and gas generation, providing annual power supply plans, monthly cost forecast updates, and system reliability analyses; hydro operations business planning; re-engineering and process improvement initiatives in utility planning and operations; and laboratory and prototype testing for hydro and thermal generating plants.
- 4. My consulting practice at Sargent & Lundy focuses on the areas of integrated resource planning, financial modeling and analysis for the assessment of power generation

technologies, project development, asset transactions, operational reviews, and facility modifications and refurbishment projects. I also perform due diligence reviews of new technology development, new projects, modification and refurbishment of existing facilities, asset transactions, and operational assessments.

5. My resume is provided in Exhibit CDU-1.

III. The NYISO's Proposed Revised Definition of "Commenced Construction"

- 6. In its June 2012 Filing in this proceeding,¹ the NYISO proposed to "grandfather" projects in new capacity zones ("NCZs") from the NCZ market power mitigation measures if they have "Commenced Construction" and have received Capacity Resources Interconnection Service ("CRIS") or have met specific requirements regarding a CRIS transfer at the same location, as of the date that the NYISO files to establish the NCZ.
- 7. In order to determine which projects would qualify to be grandfathered, the NYISO proposed to revise section 23.2.1 of its Services Tariff to include the following new definition:

"Commenced Construction" shall mean (a) all of the following site preparation work is completed: ingress and egress routes exist; the site on which the project will be located is cleared and graded; there is power service to the site; footings are prepared; and foundations have been poured consistent with purchased equipment specifications and project design; or (b) as approved by the ISO in accordance with ISO Procedures, a financial commitment comparable to (a) has been made, which includes costs incurred, and costs of cancelling, discontinuing, or suspending the project; and may consist of a combination of actions or commitments. Such actions or commitments may include: major equipment has been purchased; an engineering, procurement, and construction contract for the project has been executed by all parties and is effective; or financing has been completed.

¹ New York Independent System Operator, Inc., *Further Compliance Filing*, (filed June 29, 2012) (the "June 2012 Filing").

- 8. In its June 2013 Order,² the Commission accepted the concept of grandfathering projects that had "Commenced Construction" and the specific "physical prong" language of the proposed definition (*i.e.*, subsection "(a)" above). At the same time, it directed the NYISO to "revise the language of subsection (b) of the Commenced Construction definition to eliminate the 'as approved by the ISO in accordance with ISO Procedures' language and include, instead, specific criteria for its proposed 'financial commitment."³
- 9. The NYISO's Further Compliance Filing includes revisions to subsection (b) of the definition of "Commenced Construction" that respond to the Commission's directive. The NYISO would revise subsection (b) as follows:

"Commenced Construction" shall mean (a) all of the following site preparation work is completed: ingress and egress routes exist; the site on which the project will be located is cleared and graded; there is power service to the site; footings are prepared; and foundations have been poured consistent with purchased equipment specifications and project design; or (b) as approved by the ISO in accordance with ISO Procedures, a financial commitment comparable to (a) has been made, which includes costs incurred, and costs of cancelling, discontinuing, or suspending the project; and may consist of a combination of actions or commitments. Such actions or commitments may include: major equipment has been purchased; an engineering, procurement, and construction contract for the project has been executed by all parties and is effective; or financing has been completed the following financial commitments have been made: (i)(A) an engineering, procurement, and construction contract ("EPC") has been executed by all parties and is effective; or (B) contracts (collectively, "EPC Equivalents") for all of the following have been executed by all parties and are effective: (1) project engineering, (2) procurement of all major equipment, and (3) construction of the project, and (ii) the cumulative payments made by the developer under the EPC or EPC Equivalents to the counterparties to those respective agreements is equal to at least thirty (30) percent of the total costs of the EPC or EPC Equivalents without reference to recoverable costs or cancellation fees.

² New York Independent System Operator, Inc., 143 FERC ¶ 61,217 (2013).

³ June 2013 Order at P 68.

- I refer to proposed subsection (b) of the revised definition as the "Financial Commitment Threshold." A project will satisfy the Financial Commitment Threshold, and thus have "Commenced Construction" if it has an executed and effective EPC contract or "EPC Equivalents," and it has made payments to the respective counterparty or counterparties to those agreements.
- 11. The 30% cumulative payment requirement in proposed section (b)(ii) is based on Sargent & Lundy's review at my direction of construction cash flows of typical natural gas fired simple cycle and combined cycle generating plants and transmission projects. These projects are representative of the area that would be included in the proposal to establish a NCZ that is currently pending before the Commission in Docket No. ER13-1380, *i.e.*, Load Zones G, H, I, and J. I believe that this cumulative payment level would also be reasonable as a general rule for other potential future NCZs.
- 12. The Commission-accepted criteria set forth in subsection (a) of the term "Commenced Construction" requires a project to have completed certain milestones: site preparation, procurement of major equipment (because foundations have been poured consistent with the purchased equipment specifications,) engineering, and mobilization of construction. Site preparation requires the expenditure of funds for site acquisition or leasing, construction of access roads, and preparation of the site for construction, including site security, grading, and temporary electrical service. Construction of footings and foundations requires that major equipment needed for the project (*e.g.*, turbines, heat recovery steam generators, transformers, switchgear, and transmission cable) has been ordered. Subsection (a) also requires that design specifications have been provided by the equipment suppliers and engineering of the footings and foundations have been provided by

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performed, and that the construction contractor has mobilized and performed construction of the footings and foundations in advance of delivery of the major equipment to the site.

- 13. The contracts that collectively constitute the term "EPC Equivalents" are consistent with those that a developer would enter into if it did not have an EPC. For example, EPC's do not include owner's engineering; therefore, the "project engineering" is appropriate. Procurement of all major equipment is consistent with the subsection (a) criteria requiring foundations be poured consistent with the specifications, and is also consistent with industry practice that small equipment with short lead times is not typically procured early in a project.
- 14. My analysis of data from actual projects found EPC or EPC Equivalents spending thresholds of 22% for typical simple cycle plants and 30% for typical combined cycle plants were consistent with the physical milestones of subsection (a). I found spending thresholds ranging from 28% to 44% for transmission projects consistent with those physical milestones. Accordingly, the payment level of 30% of the total cost of the EPC or EPC Equivalents in subsection b(ii) of the Financial Commitment Threshold provision is reasonable and consistent with the subsection (a) criteria. Using a payment level of 30 % is reasonable for simple cycle projects because the rate of spending increases significantly after the physical milestones of subsection (a) are met, such that the amount of time between 22% of project spending and 30% of project spending is relatively short in duration.
- 15. The payment level is proposed to be calculated without consideration of recoverable costs and cancellation fees. A payment level of 30% represents a significant commitment of resources to the execution of a project. Some portion of the 30% expended may be

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recoverable if the project is, or is in jeopardy of being, abandoned, but the amount that is recoverable would depend on the structure of the financing security package, the specific circumstances of the cancellation, external market conditions, and other factors. For example, third parties may be available to take over a project, or major equipment ordered for a project may be resold, but factors such as the length of the schedule delay, transaction costs, and secondary market pricing would be difficult to predict. The 30% level of expenditures is an objective and verifiable criterion, and is consistent with the physical milestones in subsection (a).

This concludes my Affidavit.

ATTESTATION

I am the witness identified in the foregoing affidavit. I have read the affidavit and am familiar with its contents. The facts set forth therein are true to the best of my knowledge, information, and belief.

<u>Christopher D. Ungate</u>

Subscribed and sworn to before me this 5^{th} day of July 2013

Quelliony A Halletto Notary Public

My commission expires: Feb 12, 2023





EDUCATION

University of Tennessee, Master of Business Administration, 1984 Massachusetts Institute of Technology, M.S. Civil Engineering, 1974 Massachusetts Institute of Technology, B. S. Civil Engineering, 1973

REGISTRATIONS

Professional Engineer - Tennessee

EXPERTISE

Utility Planning Technology Evaluation Market Analysis Decision Analysis Asset Valuation and Due Diligence Generation Portfolio Analysis Risk Analysis Expert Witness

RESPONSIBILITIES

Mr. Ungate is accountable for Sargent & Lundy offerings in the Utility Planning business segment. He develops and evaluates integrated resource plans and associated analyses to identify and evaluate the optimum power supply options. He reviews and evaluates power supply planning and procurement options such as generation options available in the region (potential greenfield or plant expansion options), the viability of siting and permitting new nuclear, coal, gas, wind, solar, biomass or other alternative generation, the prospects for purchase of existing assets, and the potential for partnering with other load serving entities or power generators. He also assesses the potential and/or required renewable energy resource options, the state of transmission planning and upgrade programs, recent wholesale prices in the Client's load zone, and the fuel market and transportation capacities. He assures consistency with the Client's long-term plans and objectives and Client-specific economic factors (such as standard inflation, inflation, discount, or escalation rates).

Mr. Ungate develops models and analyses utilized in the assessment of power generation technologies, project development, asset transactions, operational reviews, and facility modifications and refurbishment projects. He bases the models on appropriate economic, project, operating, and client-specific inputs related to base-case scenarios, as well as associated sensitivity analyses. He also reviews existing models and analyses to determine if they are reasonable and appropriate, and to evaluate or develop resulting conclusions and recommendations. He also performs system reliability studies, load forecasting, and market evaluations in support of utility planning or other Client needs. He evaluates and develops plans to optimize the utilization of renewable energy resources with thermal generating units. He also performs due diligence reviews of new technology development, new projects,



modifications and refurbishment of existing facilities, asset transactions, and operational assessments.

EXPERIENCE

Mr. Ungate has over 35 years of experience in engineering and planning for electric utilities. Since joining Sargent & Lundy in 2006, his assignments have included:

UTILITY PLANNING

• Maui Electric Company

 Conducted a Generation Asset Assessment Study to review the condition of Maui Electric's generating facilities and the impact of the expected changes in usage resulting from increasing amounts of intermittent renewable resources. Each unit's remaining useful life and performance was assessed given the expected operational demands. Operational and maintenance adjustments were proposed to maximize the performance and useful life of the units.

• Grand Haven Board of Light and Power and Zeeland Board of Public Works

Prepared individual Integrated Resource Plans for two Michigan municipal utilities as part of a single study. Parts of the study related to their location in Ottawa County Michigan were common to both utilities. Integrated resource strategies were developed that included equipment maintenance and replacement recommendations and a recommended resource portfolio for the next twenty years. Potential resource options included existing and new non-renewable generation facilities, renewable energy resources, energy conservation and demand reduction programs, and longterm power purchase agreements or shared ownership options in large economiesof-scale facilities. Risk analysis was performed to evaluate how portfolio options performed under varying fuel and market prices, and environmental regulatory scenarios.

• Tennessee Valley Authority

 Supported preparation of the Need for Power and Alternatives sections of the Integrated Resource Plan. Developed Need for Power and Alternatives sections for Environmental Impact Statements for Sequoyah Nuclear Plant Relicensing and Bellefonte Nuclear Plant Unit 1 that were prepared concurrently.

• PSEG

 Developed the need for power and energy alternatives analyses to satisfy the NUREG 1555 requirements for Environmental Reports associated with an Early Site Permit Application for a new nuclear plant project. Responded to NRC questions on need for power and alternatives at the environmental site audit. Prepared responses to Requests for Additional Information.

Oklahoma Municipal Power Authority

 Reviewed the analysis of power supply options completed by OMPA staff, including a review of the annual revenue requirements derived by the OMPA power supply planning model, assessment of various options for power purchase agreements,



analysis of power plant self-build and joint ownership options, evaluation of a potential transmission upgrade, and analysis of the impact of long-term changes in fuel prices and environmental regulations.

SaskPower

 Supervised a review of corporate resource planning processes. Processes and work products were compared to state-of-the-art utility industry examples and gaps identified. Recommendations for process improvements were prepared.

• Tennessee Valley Authority

 Developed the need for power analysis to satisfy the NUREG 1555 requirements for Environmental Reports associated with a Combined Operating License Application for a new nuclear plant project.

PLANNING AND MARKET STUDIES

• New York Independent System Operator

Estimated the cost of new entrant peaking units used in the updating of demand curves for the NYISO capacity market in 2007, 2010 and 2013. Estimated going forward costs of existing generation used in determining need for market power mitigation. Estimated cost of new entry for proposed projects used to determine need for buyer side mitigation. Assisted in development of technical assessment process supporting a determination of whether a generator could transfer interconnection service rights when proposing to repower a generating unit.

New England Power Generators Association

 Estimated the cost of new entrant peaking units in New England for a NEPGA proposal to revise the basis for capacity payments in ISO-NE.

GenOn Energy

Estimated the cost of new entrant peaking and combined cycle units in two PJM zones to support GenOn's comments on PJM's CONE pricing proposal. Made presentation to and answered questions from participants in FERC Settlement Conference held to develop an agreement on the value of CONE.

Eskom

 Surveyed major equipment suppliers with capabilities to support a large coal-fired project in Africa to assess the potential effect of current and projected production capacity, resource availability, and transportation requirements on project schedule, quality, and costs.

• EPB

- Conducted seminars on selected generation, transmission and electricity market topics to prepare senior management on current trends and issues.

Confidential Client

 Led the preparation of a business plan for a client considering whether to develop a fleet of generating plants based on small modular nuclear reactor technology.



Confidential Client

 Estimated potential market volume for a cable manufacturer exploring entering the utility market.

DUE DILIGENCE STUDIES

Confidential Client

 Reviewed the operating history, environmental and regulatory requirements, contractual agreements, and technical and financial model inputs for two natural gas fired plants in support of a potential sale.

• Seven States Power Corporation

 Reviewed the performance history, environmental and regulatory requirements, contractual agreements, and operations and maintenance activities and plans for two natural gas fired combined cycle plants in support of a potential acquisition.

Confidential Client

 Reviewed the operating history, environmental and regulatory requirements, and contractual agreements, and identified potential operational limitations, plant upgrades, and expected operating life for four coal or natural gas fired cogeneration plants in support of a potential transaction.

National Economic Research Associates

 Forecast capital and operations and maintenance (O&M) costs for an existing coal plant as input to an appraisal of the plant's market value being conducted by NERA. The scope of work included the review of any necessary environmental retrofits, upgrades, etc. as required for compliance with federal or state environmental regulation and the investments required for ongoing operations assuming a remaining useful life of 20 years.

ALTERNATIVES ANALYSIS

- NV Energy
 - Developed simple and combined cycle natural gas fired capacity expansion options at six brownfield sites in Clark County, NV, to support development of the Integrated Resource Plan. Factors considered in the development of options included emissions, water availability, transmission constraints, natural gas availability, and the shape and amount of space available at the site.

• San Miguel Electric Cooperative

 Conducted study of generation alternatives to meet federal and state requirements for justification of new coal project.

CPS Energy

 Developed cost and performance assumptions for alternative technologies for use in integrated resource planning studies. Compared published estimates of costs for new nuclear plants.



• Entegra Power Services

- Conducted a planning study of adding 300 MW of natural gas-fired peaking capacity to an existing power station in the southwest US. Estimated capital costs, operating performance, and operations and maintenance (O&M) costs for three aeroderivative combustion turbine models with and without selective catalytic reduction (SCR), and two frame combustion turbine models without SCR.
- South Mississippi Electric Power Association
 - Reviewed renewable energy alternatives for this G&T cooperative in anticipation of future Renewable Portfolio Standard requirements. Directed the evaluation of responses to an RFP for renewable energy and capacity.
- Department of Energy and Sandia Renewable Energy Laboratory
 - Updated the 2003 report, "Assessment of Parabolic Trough and Power Tower Solar Technology Cost and Performance Forecasts" with the Dish technology.
- Oklahoma Gas & Electric
 - Contributed to the analysis of generating alternatives for a study of how to reduce carbon emissions from the OG&E generating portfolio.

RISK ANALYSIS

- Various Clients
 - Analyzing the risks associated with the cost, schedule, and performance impacts of proposed projects.
- Globeleq
 - Identified and quantified key drivers of increases in capital estimates for coal fired power plants.

American Electric Power

- Identified and compared key characteristics of new nuclear plant technologies.
 Assessed the risk of each technology relative to client objectives.
- Allegheny Energy
 - Developed a comprehensive risk analysis model to determine the expected outage days, generation and costs for a fleet of supercritical coal-fired units based on a high level condition assessment. The objectives were to assess the impacts of the risk issues and associated mitigation projects and to provide support for the development of capital spending plans.
- Confidential Client
 - Led a due diligence study of a potential investment in temporary power services to countries with developing economies based on diesel engine technology.

Prior to joining Sargent & Lundy, Mr. Ungate had over 30 years of experience at the Tennessee Valley Authority in a variety of engineering and planning assignments. Examples of assignments include the following:

Sargent & Lundy



- Directed supply planning for 30,000 MWs of nuclear, coal, gas, renewable, and hydro generation, and determined peak season power purchase requirements. Directed the preparation of power supply plans, and the valuation of capacity additions, major projects, product offerings, and bulk power transactions. Plans provided the basis for purchase and sale decisions; fuel purchase and inventory decisions; and hedging strategies for the commodity book.
- Led environmental controls optimization study to determine least cost approach to meeting CAIR/CAMR requirements for TVA's 15,000 MW coal generation portfolio. Alternatives included mothballing of units; increased allowance purchases; modified capital improvement programs; re-powering; and replacement with capacity and energy purchases from gas-fired units. Developed approach that resulted in reduction of projected end of period debt by more than \$1 billion.
- Provided cost analysis for product pricing for industrial customers. Determined analytical approach and oversaw analyses to determine value of interruptible products, standby power, customer co-generation, long vs. short term contracts, and dispersed power products.

BUSINESS AND STRATEGIC PLANNING

- Directed business planning for portfolio of 109 conventional hydropower units at 29 sites and four pumped storage units. Portfolio supplies 10-15% of company sales with 5000 MWs of capacity. Forced outage rates, recordable injury incident rates, and reportable environmental events were increasing over the previous six years. Developed a five year business plan to increase resources to facilitate the transition to a process management maintenance strategy, and to integrate plant modernization and automation projects to change technology and workflow at the plants.
- Directed the first reassessment of the operating policies of Tennessee Valley Authority reservoirs since the system was designed in the 1930's. Stakeholders were concerned about water quality issues affecting the reservoirs and about the adverse impact of lake levels on property values and recreation-oriented businesses. Led initiative to redefine operating policies, examine environmental concerns, expand public interest and support, and more effectively meet the needs of multi-state customer base. Directed the development of an operating scheme that preserved hydropower value while improving summer lake levels for recreation and increasing minimum flows for water quality.
- Developed competitive analysis for an electric utility. Customers seeking choice of energy suppliers created need for a credible competitive analysis for electric utility monopoly. Price to customers was above competitive energy suppliers. Loss of customer load would create the risk of not recovering the high fixed costs of generation built to serve former customers. Quantified the competitive threat, and identified the circumstances under which loss of customers was most likely.

PROJECT ENGINEERING



- Directed 40-50 engineers, technicians and building trades conducting laboratory and prototype testing of thermal and hydro plant performance problems. Responsible for daily operating management, laboratory safety, quality assurance, human resources, technology acquisition and facilities management.
- Conducted field tests and physical modeling studies on the effects of thermal generating plants on rivers and reservoirs. Contributed to preparation of several environmental statements impacting authorizations for plant operations and discharge.

MEMBERSHIPS

Board of Examiners, Tennessee Quality Award, 1997-99

PUBLICATIONS

"Baseload Generation Capital Cost Trends," Electric Power Conference, May 2007.

"Resolving Conflicts in Reservoir Operations: Some Lessons Learned at the Tennessee Valley Authority," American Fisheries Society symposium, 1996.

"Tennessee Valley Authority's Clean Water Initiative: Building Partnerships for Watershed Improvement," Journal of Environmental Planning and Management, 39(1), 1996.

"Equal Consideration' at TVA: Changing System Operations to Meet Societal Needs," Hydro Review, July 1992.

"Reviewing the Role of Hydropower in TVA Reservoir Operations," with Douglas H. Walters, Waterpower '91, An International Conference on Hydropower, Denver, Colorado, 1991.

"TVA's Lake Improvement Plan: Reviewing the Operating Objectives of TVA's Reservoir System," National Conference on Hydraulic Engineering, Nashville, Tennessee, July 1991.

"Tennessee River and Reservoir System Operation and Planning Review, Final Environmental Impact Statement," with TVA staff, December 1990.

"Field and Model Results for Multiport Diffuser Plume," with Charles W. Almquist and William R. Waldrop, American Society of Civil Engineers Specialty Conference on Verification of Mathematical and Physical Models, University of Maryland, August 1978.

"Mixing of Submerged Turbulent Jets at Low Reynolds Number," with Gerhard Jirka and Donald R. F. Harleman, M.I.T. Ralph M. Parsons Laboratory, Report No. 197, February 1975.