Jessica A. Cano
Senior Attorney
Florida Power & Light Company
700 Universe Boulevard
Juno Beach, FL 33408-0420
(561) 304-5226
(561) 691-7135 (Facsimile)

July 7, 2015

-VIA ELECTRONIC FILING-

Carlotta Stauffer, Director
Division of Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

Re: Docket No. 150009-EI; Nuclear Cost Recovery Clause

Dear Ms. Stauffer:

Please find enclosed for filing in the above referenced docket Florida Power & Light Company's ("FPL's") rebuttal testimony of S. Scroggs, S. Sim, and J. Reed. This letter, the three pieces of rebuttal testimony, and a certificate of service together are being submitted via the Florida Public Service Commission's Electronic Filing Web Form as a single PDF file.

If there are any questions regarding this filing, please contact me at 561-304-5226.

Sincerely,

s/ Jessica A. Cano
Jessica A. Cano
Fla. Bar No. 0037372

Enclosures
cc: Counsel for Parties of Record (w/encl.)

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 150009-EI
FLORIDA POWER & LIGHT COMPANY

IN RE: NUCLEAR POWER PLANT COST RECOVERY AMOUNT FOR THE YEAR 2016

REBUTTAL TESTIMONY OF:

STEVEN D. SCROGGS

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

REBUTTAL TESTIMONY OF STEVEN D. SCROGGS

DOCKET NO. 150009-EI

JULY 7, 2015

Q. Please state your name and business address.

A. My name is Steven D. Scroggs. My business address is 700 Universe Boulevard, Juno Beach, Florida 33408.

Q. By whom are you employed and what is your position?

A. I am employed by Florida Power & Light Company (FPL or the Company) as Senior Director, Project Development. In this position I have responsibility for the development of power generation projects to meet the needs of FPL's customers.

Q. Have you previously provided testimony in this docket?

A. Yes.

Q. Are you sponsoring or co-sponsoring any rebuttal exhibits in this case?

A. No.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to discuss and respond to statements made by the Office of Public Counsel (OPC) Witness Jacobs and the City of Miami (COM) Witness Meehan, who have filed testimony in this docket.

Q. Please summarize your rebuttal testimony.

A. My testimony corrects mischaracterizations by Witness Jacobs with respect to the basis of FPL's non-binding cost estimate range and the validity of FPL's feasibility analysis. My testimony also addresses, and places into the proper context within the Turkey Point Unit 6 & 7 project, the experience of the first wave of U.S. AP1000 projects and how the lessons learned in these projects have informed and will continue to inform FPL's planning and implementation of the project. I also discuss the misleading nature of calls by Witnesses Jacobs for obtaining construction bids at this stage of the Turkey Point Units 6 & 7 project and describe the process FPL plans to employ within the amended Nuclear Cost Recovery (NCR) statute to achieve the desired level of certainty to inform the necessary decisions the Florida Public Service Commission (FPSC or the Commission) must make as the project develops. Finally, I address the nature of the Initial Assessments and the role they play in reducing the uncertainty at this stage of the project while remaining consistent with the amended NCR statute.

PROJECT COST ESTIMATE AND FEASIBLITY

Q. Please respond to Witness Jacobs's assertion that FPL's feasibility analysis is flawed because the analysis uses unreasonably low cost estimates for Turkey Point 6 & 7.

A. I disagree. FPL's cost estimate range for the Turkey Point Units 6 & 7 project is well supported and reasonable. It is based on the original cost estimate range provided in the 2008 Need Determination, was substantiated by a cost

estimate "check" using Westinghouse pricing information in 2010, and now reflects FPL's revised project schedule and estimated spend curve over the duration of the project. FPL's nonbinding cost estimate range has been updated and reviewed in annual NCR filings each year from 2009 through 2014.

Further, the feasibility analysis provides multiple conservative assumptions ensuring the results are appropriate for an informed decision by the Commission. For example, the feasibility analysis conservatively compares the breakeven cost of the next best alternative to the high end of the cost estimate range for Turkey Point Units 6 & 7. Additionally, the analysis is annually updated to reflect the characteristics of the improving competitive technology and the evolving economic and regulatory market (for example, updating fuel and emission compliance cost forecasts) in which the project will operate.

Q. Is FPL's non-binding cost estimate range based on the publicly reported costs for Vogtle Units 3 and 4 and Summer Units 2 and 3, as Witness Jacobs claims?

A. No. FPL's cost estimate was developed using an independent government and industry study of costs for a two unit project at TVA's Bellefonte site combined with cost estimates specific to the Turkey Point site for civil work and supporting infrastructure. This cost estimate has been maintained through the history of the project by escalating the overnight capital cost to the current

year, and calculating time related costs (e.g., interest during construction, escalation) based on the then current project schedule. In 2010, a check of this cost estimate range was conducted using a price estimate provided by Westinghouse. The check confirmed that the non-binding cost estimate range was inclusive of the Westinghouse price estimate. Further, the cost check indicated that the likely cost of the Turkey Point 6 & 7 project was toward the high end of the cost estimate range.

Q. Both Witness Meehan for COM and Witness Jacobs for OPC observe that other new nuclear projects have experienced schedule delays and cost increases. Please respond.

A. The issues experienced by first wave new nuclear construction projects are not unexpected. In fact, as I have communicated throughout this project's life, FPL's stepwise approach has been designed to monitor and benefit from the lessons learned and experience gained by the industry as these first wave projects move through licensing and construction into operation. FPL continues to monitor the first wave projects through involvement in industry groups, monitoring visits to the active construction sites, and involvement in continuous efforts to improve quality controls and the safety oriented culture of the industry supply chain that supports new nuclear deployment.

Q. Witness Meehan states that FPL's feasibility analysis does not "sufficiently consider or explain" the uncertainty of the construction schedule and cost assumptions (p. 10-11). He later opines that a more

complete review of construction costs and schedule is needed (p. 21). Please respond.

A. FPL's consideration of the uncertainties associated with new nuclear construction schedules and costs is the driving force behind its stepwise decision-making approach to new nuclear development; an approach OPC Witness Jacobs now characterizes as a "minimalist approach" that is "a preferable course of action" (p. 5).

As with many decisions in the face of uncertainty, a bounding analysis (i.e., the examination of a range of potential outcomes as compared to a singular set of assumptions with a singular result) is relied upon to provide decision makers the necessary foundation to make incremental decisions. FPL's feasibility analysis is uniquely designed to address this uncertainty by bounding key economic factors: nuclear capital cost, and competitive alternative generation lifecycle costs, including a range of fuel and emission compliance costs. Further, as indicated in my May 1, 2015 testimony in this docket, consistent with its measured approach to this project, FPL is currently engaged in work that will provide a higher predictability in cost and schedule for key activities. This work, referred to as Initial Assessments, will provide additional schedule and cost granularity to better inform the feasibility analysis that will support the decision to move into "preconstruction work" (as that term is used in F.S. 366.93(3)(c)) following receipt of the Combined License ("COL") in early 2017, and help ensure that the future work will

comply with the requirements of the COL. The feasibility analysis that the Initial Assessments support is scheduled to be provided for Commission consideration in the 2016 NCR docket.

Q. Witness Jacobs recommends that FPL incorporate "actual, binding bids" from qualified Engineering Procurement and Construction (EPC) firms, plus contingency, in FPL's non-binding cost estimate range and feasibility analysis now and prior to beginning preconstruction work (p. 15-16). What is your reaction?

A. In my opinion, it is not possible to obtain "actual, binding bids" from a contractor that could be relied upon at this stage of the project.

Q. Please explain.

A. Witness Jacobs's call for a more definitive cost basis through "actual, binding bids" is misleading as it includes an assumption that such bids can be developed at this stage of the project. An actionable bid requires a detailed scope of work, firm schedule milestones, and contractual terms and conditions. In the absence of any of these essential components, there is an incomplete basis upon which bids can be developed.

Given the impacts of recent NCR statutory amendments, FPL is unable to provide the requisite level of schedule and funding commitment that would be necessary to solicit meaningful and realistic bids from potential participants at this stage of the project. An "actual, binding bid" from a contractor would necessarily include commitments of contractor resources, material and labor

pricing based on current market conditions, and the financial capacity to execute on a specific timeline. Until a clear path to implementation is identified and approved by the Commission, FPL will not be able to obtain meaningful and realistic competitive bids reflecting the combined influences of current costs, a defined schedule, and associated terms and conditions needed to support a more certain and executable cost and schedule estimate. Bids solicited and received without a solid timeline and a well-defined set of terms and conditions would be expected to reflect those uncertainties in the form of additional costs.

It is simply not commercially reasonable for Mr. Jacobs to suggest that vendors would be willing to provide a competitive, binding bid without this kind of project and schedule definition.

Q. Is a clear path to implementation achievable within the revised statutory framework?

A. Yes. In order to obtain Commission authorization to undertake preconstruction work, FPL is working to better develop available information on cost and schedule. This requires the work scope identified in the company's Initial Assessments; work specifically identified to provide needed fidelity on that which can be developed *without* preconstruction work, which is more in-depth. Specifically, the Initial Assessments sharpen the focus on the forward schedule sequence and critical activities to implement the project. This information is needed to support the pivotal feasibility analysis that will

support moving from licensing activities to preconstruction work, anticipated for this proceeding in 2016. If, based on the more focused work that will be reflected in that feasibility study, the Commission authorizes preconstruction work, then the Company would be in a position to proceed with work that will include obtaining realistic and actionable bids to support the ultimate decision to proceed from post-COL preconstruction work to actual plant construction.

If it were not for the very practical problems I discuss above, OPC Witness Jacobs's suggestion would provide a higher predictability in cost and schedule for key construction activities. But one can see the circularity in this challenge. So, while agreeing conceptually with Witness Jacob's as to the need to move toward that objective, FPL is taking a more pragmatic approach.

Again, this stepwise approach has served FPL and its customers very well and we are endeavoring to take the right steps in time to ensure appropriate decisions are able to be made at the appropriate points in time by the Commission.

Q. In the alternative, Witness Jacobs claims FPL should include in its non-binding cost estimate range the owners' costs and estimates for contractors' costs related to the Vogtle and Summer projects. Please respond.

A. With respect, this makes no sense. It further demonstrates a lack of understanding of how FPL developed its estimate and is fundamentally

misleading. Such an approach fails to acknowledge the very real impact incorporation of lessons learned from the first wave of new nuclear projects are expected to have on the execution of the Turkey Point 6 & 7 project. A blanket adoption of the first wave experience would not reflect anticipated improvements, differences in construction of supporting infrastructure, or changes in contracting or execution support. Witness Reed discusses impacts of lessons learned in project execution and cost.

Q. Is FPL incorporating these lessons learned at this stage of the project?

A. Yes. Through our project schedule review conducted in 2014, with the assistance of Chicago Bridge and Iron, many of these lessons learned have been identified and guided assumptions used in the development of the revised project schedule. For example, other new nuclear projects have faced issues associated with the time necessary to construct, test, and validate the quality of the "batch plant" concrete, which must comply with nuclear safety requirements. As a result, FPL has incorporated an earlier start date for that work in its revised project schedule. FPL also identified the need to perform the Initial Assessments discussed in my May 1, 2015 testimony to better refine the schedule prior to initiating preconstruction work as part of that review. Further incorporation of lessons from the first wave of new nuclear projects will be important to the development of information that will form the basis of the ultimate decision to proceed to construction.

Q. Please respond to Witness Jacobs's prediction that "it is highly unlikely that in the next round of AP 1000 construction projects, contractors will offer fixed/firm price EPC contracts" (p. 11).

A. It is debatable that the first wave contracts can accurately be characterized as fixed/firm price EPC contracts, as that term has been commonly used in power plant construction. FPL is very familiar with execution of true EPC contracts, and we have long expressed our concern that such a contract, with truly firm price components and contractually fixed price components, could not be developed and implemented for a project of this scale and complexity. That is why FPL has maintained the potential that the final contract may be more of a set of contracts, or an EP and a C contract. In summary, FPL has never relied on the expectation of a "fixed/firm price EPC contract" in order to implement the Turkey Point Units 6 & 7 project or estimate project costs.

Thus, regardless of how one characterizes the nature of first round of AP 1000 contracts, Witness Jacobs's point is essentially moot as far as FPL's planning is concerned.

Q. With respect to the 6 scenarios in which the breakeven costs are within the non-binding cost-estimate range, Witness Meehan claims FPL has offered a weak endorsement of the project by categorizing these as scenarios that "may" be economic. Please respond.

A. The break-even analysis is a tool that has been developed for this project due to the lengthy process of obtaining licensing approvals ahead of the timeframe

in which actionable bids can be obtained. The bounding approach conservatively measures the project's quantitative benefits by comparing the high end of the cost estimate range against an ever increasingly efficient combined cycle gas fired alternative plant on an increasingly efficient FPL system. Given the significant changes that have occurred in technology, fuels and other markets during the duration of the Turkey Point 6 & 7 project, the continued staying power of the project is a rather strong endorsement of its robustness. Additionally, the qualitative benefits of zero emissions and fuel diversity remain in favor of the new nuclear technology.

Q. Witness Meehan also implies that FPL should consider a significant deferral of the Turkey Point 6 & 7 project (i.e., to 2047) and meeting interim needs with gas plants. Please respond.

A. FPL believes that the history of nuclear power in the U.S. and in the FPL system, along with the many qualitative benefits Turkey Point 6 & 7 is expected to provide, support deployment of the technology on its earliest practicable timeframe. However, FPL's stepwise approach on this project is not inconsistent with Witness Meehan's suggestion. As I have discussed in prior testimony, FPL employs a continuous check and adjust process, with the potential use of "off-ramps" to control project expenditures as new information is developed.

INITIAL ASSESSMENTS

Q. Please respond to Witness Jacobs's contention that FPL's Initial Assessments are not related to or required for obtaining the COL.

A. Although the Initial Assessments are not "required" to obtain the COL, they are in fact related to the COL process. Initial Assessments are achievable and reasonable to provide a more robust cost and schedule estimate to be used for the feasibility analysis. The feasibility analysis is part of the NCR process that enables FPL to obtain a COL. (FPL previously has stated that absent the NCR statute and rule, FPL would not be able to pursue its new nuclear power plant investments.) In order to obtain the cost recovery that allows FPL to obtain and then maintain the COL, the NCR filing requirements must be satisfied. Additionally, conduct of the Initial Assessments better informs the technical work necessary to maintain compliance with the COL.

Q. He also claims that the Initial Assessment costs "as described by FPL" (p. 17) are preconstruction work beyond those activities that are necessary to obtain or maintain a COL. Please respond.

A. The Initial Assessments have a specific purpose, which is to increase the project schedule certainty for use in the feasibility analysis required by the cost recovery process and to support authorization to begin preconstruction work. This purpose is essentially what Witness Jacobs suggests would be served by engaging in the time and cost intensive effort to obtain binding bids from contractors. For the reasons I have discussed above, this is not a commercially practicable or viable option at this step of the project. However,

we will obtain a more refined schedule and cost data through the Initial Assessment work in progress. This will facilitate the review process at the next major step in this project, i.e., a Commission determination of whether FPL should proceed to pre-construction work. Further, as discussed above, this cost recovery process is fundamental to FPL's pursuit and maintenance of the COL.

Q. Witness Jacobs ultimately recommends that only costs related to, or necessary for, obtaining the COL be approved for recovery at this time. Please respond.

A. FPL is only seeking to recover costs related to, or necessary for, obtaining the COL at this time. It is FPL's view that this recovery request could have included the costs associated with the Initial Assessments, had FPL chosen to seek recovery of those costs at this time. Instead, FPL has proposed to defer recovery until the decision to proceed to preconstruction work and the supporting feasibility analysis, which those Initial Assessment activities support, is presented to the Commission.

Q. Does this conclude your testimony?

A. Yes.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 150009-EI
FLORIDA POWER & LIGHT COMPANY

IN RE: NUCLEAR POWER PLANT COST RECOVERY AMOUNT FOR THE YEAR 2016

REBUTTAL TESTIMONY OF:

STEVEN R. SIM

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

REBUTTAL TESTIMONY OF STEVEN R. SIM

DOCKET NO. 150009-EI

July 7, 2015

Q. Please state your name and business addresses.

A. My name is Steven R. Sim, and my business address is 9250 West Flagler Street, Miami, Florida 33174.

Q. By whom are you employed and what is your position?

A. I am employed by Florida Power & Light Company (FPL) as Senior Manager of Integrated Resource Planning in the Resource Assessment & Planning Department.

Q. Please describe your duties and responsibilities in that position.

A. I supervise and coordinate analyses that are designed to determine the magnitude and timing of FPL's resource needs and then develop the integrated resource plan with which FPL will meet those resource needs.

Q. Please describe your education and professional experience.

A. I graduated from the University of Miami (Florida) with a Bachelor's degree in Mathematics in 1973. I subsequently earned a Master's degree in Mathematics from the University of Miami (Florida) in 1975 and a Doctorate in Environmental Science and Engineering from the University of California at Los Angeles (UCLA) in 1979.

While completing my degree program at UCLA, I was also employed full-time as a Research Associate at the Florida Solar Energy Center during 1977 - 1979. My responsibilities at the Florida Solar Energy Center included an evaluation of Florida consumers' experiences with solar water heaters and an analysis of potential renewable energy resources including photovoltaics, biomass, wind power, etc., applicable in the Southeastern United States.

In 1979 I joined FPL. From 1979 until 1991 I worked in various departments including Marketing, Energy Management Research, and Load Management, where my responsibilities included the development, monitoring, and cost-effectiveness analyses of demand side management (DSM) programs. In 1991 I joined my current department, then named the System Planning Department, where I held different supervisory positions dealing with integrated resource planning. In late 2007 I assumed my present position.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is primarily to rebut statements made about forecasts and assumptions used in FPL's 2015 feasibility analyses made by City of Miami (COM) witness Meehan and Office of Public Counsel (OPC) witness Jacobs in their testimonies. I explain why these statements are incorrect and/or misleading. I conclude that neither Mr. Meehan's nor Dr. Jacobs' testimonies provide meaningful or reliable information for use by the Florida Public Service Commission (FPSC).

Q. Please summarize your rebuttal testimony.

A. The testimonies of Mr. Meehan and Dr. Jacobs contain a number of problems. Mr. Meehan calls for the FPSC to conduct a thorough review of the feasibility analyses, apparently unaware that is what the FPSC do each year in accordance with the Nuclear Cost Recovery (NCR) Rule. Although he calls particular attention to the fact that the CO_2 and transmission-related projected benefits are significant, he offers no alternate forecasts or analysis methodologies that he believes are superior to FPL's forecasts and methodologies. Instead, Mr. Meehan simply makes unsupported assumptions that these benefits should be reduced by 100% or 50%. He presents exhibits that are designed to show that the Turkey Point 6 & 7 project is not economical but only after he makes these arbitrary adjustments to FPL's projected CO_2-related and transmission-related benefits. However, even ignoring his lack of methodology and his application of arbitrary assumptions, if we factor in his own statements that new nuclear units likely would operate for 60 years and there would likely be carbon costs, the opposite result emerges: the overwhelming majority of his cases project that Turkey Point 6 & 7 are projected to be either economically feasible or potentially feasible.

In regard to Dr. Jacobs, most of his testimony is addressed by FPL witnesses Scroggs and Reed. I did review one calculation he presents in an attempt to show that, with increases in the capital costs of Turkey Point 6 & 7, the new nuclear units cannot be economic. As I explain later in my testimony, Dr.

Jacobs' approach is fundamentally flawed, as it arbitrarily adjusts only one lever in a multi-levered, annually changing evaluation of the project's economics.

REBUTTAL TO MR. MEEHAN

Q. Please summarize what you understood to be the main message of Mr. Meehan's testimony.

A. Mr. Meehan's testimony seemed to have a simple message that can be summarized as follows: the FPSC should conduct a thorough review of the 2015 feasibility analysis, including the transmission-related and CO_2-related benefits included in the feasibility analysis.

Q. Please summarize your response to his main message.

A. FPL's approach in its 2015 feasibility analyses, including transmission benefits and CO_2 benefits, is essentially unchanged from the prior feasibility analyses that have been filed by FPL. These analyses, including the analysis methodologies and assumptions, are reasonable and have been consistently reviewed and accepted by the FPSC.

Q. What is your response to Mr. Meehan's contention that there is a "*...need for a thorough, in-depth evaluation of the Turkey Point units 6 and 7 investment at this time, when it is clear that the circumstances under which the investment was approved have changed radically*"? (Page 9, lines 13-15)

A. From his testimony, it appears that Mr. Meehan is unaware that Florida has conducted a Nuclear Cost Recovery (NCR) hearing every year since a need

determination was granted for Turkey Point 6 & 7 in 2008. In each of these prior dockets, and again in this docket, FPL presents a detailed feasibility analysis that is required by the NCR Rule. FPL's annual feasibility analysis utilizes the most current values for a variety of assumptions including: forecasted fuel costs, forecasted environmental compliance costs, capital costs, sunk costs, etc. In other words, FPL's 2015 feasibility analysis is updated to account for many changes in assumptions – some of which are significant – since the Determination of Need in 2008. Furthermore, all of the assumptions will be reviewed and updated annually in future NCR dockets.

Thus Mr. Meehan's statement to the effect that assumptions have changed is well known to both the FPSC and FPL. Both parties recognize that major assumptions and forecasts change from year-to-year. Because of this fact, the assumptions such as those listed above are reviewed and, as appropriate, updated in each annual feasibility analysis. Thus Mr. Meehan's call for *"...a thorough, in-depth evaluation of ...Turkey Point 6 & 7..."* is exactly what FPL's 2015 feasibility analysis represents, and is what FPL's feasibility analyses have reflected in each prior year of the NCR filings.

Q. What is your response to Mr. Meehan's contention that feasibility of the new nuclear units *"...is increasingly dependent upon a 60 year life assumption..."*? (Page 9, lines 7-9)

A. I find this odd considering that on page 19, lines 11 and 12 of his testimony, Mr. Meehan makes the following statement: *"I do not question the likelihood*

that Turkey Point, if built would operate for 60 years." It appears that Mr. Meehan states on the one hand that 60 years is the correct assumption for the operating life of the new nuclear units, but on the other hand is somehow troubled that the new nuclear units are projected to be cost-effective when using what he agrees is the correct operating life assumption.

FPL agrees with Mr. Meehan that a 60-year life assumption is the more meaningful assumption for reasons discussed in FPL witness Brown's direct testimony beginning on page 17, line 19. As each year takes FPL's and NextEra Energy's existing nuclear units further beyond the point in time when they have operated for 40 years, and towards their licensed 60-year operating terms, the 60-year life assumption becomes more meaningful.

Q. Please respond to Mr. Meehan's contention that feasibility of the new nuclear units "*...only appear economic because of these two assumptions (transmission benefits and CO_2 costs).*" (Page 11, line 13)

A. This year, the transmission and CO_2-related benefits play a relatively more significant role in the economic feasibility of the project than in past years, in part because other cost forecasts are lower. However, these assumptions have not always provided the predominant benefits. For example, in the years 2008-2014, the natural gas cost savings of the project have outweighed the CO_2 cost savings on both a nominal and Cumulative Present Value of Revenue Requirements basis. It should be obvious that as natural gas prices have declined, other forecasts and assumptions play an increasing role in the

analysis. I also believe that because natural gas prices are so low, any significant changes in natural gas prices that occur in the future are likely to be in the direction of higher costs. One cannot assume that in future analyses the transmission- and CO_2–related benefits will play as meaningful a role relative to other factors. Assumptions changes are made on a regular basis by FPL in order to utilize the best and most current information available in its resource planning analyses.

Q. Are the projected CO_2-related benefits in FPL's 2015 feasibility analyses significant?

A. Yes. However, that does not mean that the assumptions themselves are unreasonable.

Q. Are the projected CO_2-related benefits in FPL's 2015 feasibility analyses commensurate with CO_2-related benefits projected in prior feasibility analysis filings?

A. Yes. However, the current projection of CO_2-related benefits is smaller than projections from several years ago. Such a change in projections can always occur, in either direction, when updating assumptions and forecasts each year. Again, that is not the measure of the reasonableness of the assumption. Indeed, the point should be taken that assumptions do vary over time. The purpose of this year's feasibility analysis, as in prior years, is to reset from the subsequent year's work toward procuring the Combined License.

Q. Are the projected CO_2-related benefits in FPL's 2015 feasibility analyses based on a methodology similar to that used in FPL's prior annual

feasibility analyses that have been reviewed each year and accepted by the FPSC?

A. Yes. The methodology behind the cost values is essentially unchanged. The only exception is that, for the 2015 feasibility analysis, FPL advanced the start date of the previously (in 2014) forecasted CO_2 $/ton cost values by three years so that the start date for the CO_2 cost values is 2020 instead of 2023. This was done because the EPA's draft Clean Power Plan (CPP) rules that were released in mid-2014 called for CO_2 emission rate targets that begin in 2020.

Q. Please describe FPL's use of forecasted CO_2 costs and the source of this forecast.

A. FPL began using projected CO_2 compliance costs in 2006/2007 in its need determination for new coal-fired capacity. It has used a CO_2 cost forecast ever since in its resource planning work regarding all types of resource options. Thus forecasted CO_2 costs have been used in analyses of a variety of resource options, including: combined cycle (CC) units, combustion turbine units, demand side management (DSM), solar, and nuclear. CO_2 cost forecasts were also used in the determination of need filing for Turkey Point 6 & 7 in 2007 and have been updated and used ever since in the feasibility analyses that have accompanied FPL's annual NCR filings.

All of FPL's CO_2 cost forecasts have been based on projections made by the respected consulting firm, ICF International (ICF). ICF serves both private

and governmental clients, including the U.S. EPA. In its work for the EPA, ICF is providing analyses of various potential CO_2-related regulatory initiatives including the CPP.

ICF's CO_2 cost forecasts have been based on a probability-weighted projection of likely CO_2 compliance costs. Through 2012 ICF assigned probabilities for each year in the projection to a wide range of potential CO_2 costs. The range included no CO_2 costs (which was based on a scenario in which it was assumed no CO_2 legislation was passed by the U.S. House and Senate, then signed into law by the President) to various projections of CO_2 legislation (with associated costs) then being discussed by the House and/or Senate. Each of the probability-weighted outcomes for a given year were summed to derive a CO_2 cost value for that year. The resulting probability-weighted projection of CO_2 costs resulted in a value of $0/ton for some number of early years, then a range of non-zero $/ton values after that. As legislative initiatives ended or changed over time, ICF's projections also changed. Based on ICF's changes in projected CO_2 costs, FPL's forecasts of CO_2 costs that have been used in its resource planning work have also periodically changed.

ICF's cost projections were typically released in terms of real dollars through the year 2030. Based on guidance from ICF, FPL converted these values to nominal dollars for use in FPL's resource planning work. And with the

knowledge that if CO_2 legislation/regulation was passed/issued in the near-term, it was likely that additional legislation/regulation would further restrict CO_2 emissions in future years, FPL also received guidance from ICF regarding escalation of the $/ton cost projections into the future.

Around 2013, discussion of CO_2-related legislation at the federal level basically stalled. As a consequence, ICF advised FPL that ICF's most recent (2012) CO_2 cost forecast was the best projection it had regarding future CO_2 costs. Consequently, FPL used that projection in its 2013 and 2014 resource planning work including the nuclear feasibility analyses in those years. In 2015, after further discussions with ICF that highlighted the uncertainty surrounding the mid-2014 CPP draft rules, FPL utilized these values again, but adjusted the start year for these costs so that CO_2 costs were projected to begin in 2020.

FPL agrees with Mr. Meehan that there is considerable uncertainty regarding CO_2 compliance costs. Much of that uncertainty will not be cleared up until: (i) the CPP final rules are issued this Summer or soon thereafter; (ii) litigation addressing the final rules and the EPA's authority to issue such rules is resolved; and (iii) each state, including Florida, develops its state implementation plan for meeting the final rules.

In sum, FPL's CO_2 cost forecast is based on the best information and guidance available at this point in time. FPL's CO_2 cost forecast utilized in the 2015 feasibility analysis is a reasonable forecast.

Q. Did Mr. Meehan provide an alternate CO_2 cost forecast from an independent outside source to compare to FPL's?

A. No.

Q. Did Mr. Meehan provide an alternate CO_2 cost forecast that he developed to compare to FPL's?

A. No.

Q. Did Mr. Meehan offer any meaningful CO_2 cost forecast comparisons in an attempt to argue against the CO_2 forecast that FPL utilized?

A. No. Instead, Mr. Meehan's testimony simply points out that the projected CO_2 benefits from Turkey Point 6 & 7 are significant, and concludes that if one assumes these benefits completely vanish, or assumed they were cut in half, then the Turkey Point 6 & 7 project might not be cost-effective. Then, in his exhibits, he uses these completely arbitrary assumptions and removes either 100% of CO_2 benefits or 50% of these benefits (along with similarly arbitrary assumptions regarding a reduction in transmission-related benefits). It is no surprise that if one arbitrarily removes large blocks of projected benefits, the projected economics of projects such as Turkey Point 6 & 7 will decrease.

Q. Did Mr. Meehan recognize that, when forecasting a cost far into the future, there is a chance the forecast could be overstated *or* understated?

A. No. It is possible that FPL's actual CO_2 compliance costs, 40 or 60 years into the future, will actually be higher than FPL has forecasted. Virtually any forecast has that type of symmetrical risk, but does not detract from the reasonableness of FPL's forecast.

Q. What is your take on Mr. Meehan's approach to CO_2 costs?

A. As previously stated, Mr. Meehan simply grabs two arbitrarily chosen percentages (0% and 50%) out of the air and applies them to the projected CO_2-related benefits. Regarding the complete elimination of all CO_2-related benefits, it appears from Mr. Meehan's testimony that even he doesn't believe in that assumption: *"I do not think it is unreasonable to attach a monetary value to carbon as over the 2027 to 2088 period during which Turkey Point units 6 & 7 would operate, some type of carbon limit and associated costs would appear more likely than not."* (Page 13, lines 8-11) Yet he offers calculations in his exhibits that assume no CO_2-related cost benefits to Turkey Point 6 & 7 over either a 40-year or the same 60-year time period. These calculations should be ignored as they are inconsistent with Mr. Meehan's own testimony, even putting aside the fact that the assumptions themselves are no more than arithmetic applications without foundation or theory.

He also offers no explanation or support for his assumption that FPL's projected CO_2-related benefits should be reduced by 50%. Mr. Meehan's assumptions and calculations are neither rigorous nor reasonable.

Q. Is there anything else regarding Mr. Meehan's discussion of CO_2-related benefits that needs to be addressed?

A. Yes. In his testimony, Mr. Meehan discussed the fact that projected nominal CO_2-related benefits (and thus projected CO_2 $/ton projected costs) had reached a significant level by the year 2067. However, what Mr. Meehan chose not to discuss is the minimal impact of any 2067 cost value on the present value of costs reflected in FPL's analysis. The year 2067 is 52 years into the future. Using FPL's 7.51% discount rate to determine present values in terms of 2015$, a $100 nominal cost in 2067 equates to only slightly over $2 in 2015$. Furthermore, when considering the 60-year life assumption, that same $100 nominal cost in 2087 equates to about 54 cents in 2015$. Thus cost projections that far into the future have relatively little impact in long-term NPV cost projections. Therefore, Mr. Meehan's testimony on this point is misleading.

Q. Are the projected transmission-related benefits in FPL's 2015 feasibility analyses also significant?

A. Yes. However, that does not mean that the assumptions themselves are unreasonable.

Q. Are the projected transmission-related benefits in FPL's 2015 feasibility analyses proportionate with transmission-related benefits projected in prior feasibility analysis filings?

A. Yes. However, the current projection of transmission-related benefits is smaller than the projection from last year. Such a change in projections can

always occur, in either direction, when updating assumptions and forecasts each year.

Q. With regard to FPL's projection of transmission-related benefits in FPL's 2015 feasibility analyses, are these projected transmission-related benefits based on a methodology similar to that used in prior FPL annual feasibility analyses that have been reviewed and accepted by the FPSC?

A. Yes. FPL has used this same methodology in the feasibility analyses presented in 2013 and 2014.

Q. Has FPL assumed similar types of transmission benefits in other analyses?

A. Yes. FPL has included projected transmission benefits in other resource planning analyses, such as the DSM Goals analyses (Docket No. 130199-EI).

Q. Please discuss what the projected transmission-related benefits for Turkey Point 6 & 7 represent and how the benefit values are derived.

A. From a transmission standpoint, FPL needs to maintain a balance between electrical load and generation in Southeastern Florida, i.e., in Miami-Dade and Broward Counties. The electrical load in Southeastern Florida has continued to increase and is projected to increase further in the future. In order to maintain a balance between this increasing load and generation in this area, one of two things must occur: FPL can either build generation in the two county area or FPL can build regional transmission lines from north of Broward County into the area that will allow additional power to be imported into Southeastern Florida.

The methodology that FPL utilizes to project the cost of these regional transmission lines is straightforward. First, assuming no generation will be built in the two county area (new generation needed to meet FPL's reliability criteria is assumed to be built north of Broward County) and accounting for already planned transmission upgrades and additions, a projection is made regarding when (i.e., in what years) new transmission facilities need to be built. Second, based on current cost projections for new transmission facilities, transmission capital and O&M costs are assigned to this schedule for the new transmission facilities.

Third, one returns to the starting point and a new assumption is made that Turkey Point will be built in 2027 and 2028. This addition of significant generation capacity in Miami-Dade County results in deferred need for new transmission facilities to import power into the area. This is reflected in a new projection for these facilities. Fourth, transmission costs are assigned to this changed schedule of transmission additions. Lastly, the difference in the transmission costs between these two schedules is calculated. This difference represents the avoided transmission cost benefit for Turkey Point 6 & 7 and this cost difference is assigned to the Resource Plan without Turkey Point 6 & 7.

Q. Did Mr. Meehan provide any transmission analysis with which he attempts to argue against FPL's projected transmission-related benefits for Turkey Point 6 & 7?

A. No.

Q. Did Mr. Meehan offer anything of substance with which he attempts to argue against the projected transmission-related benefits?

A. No. Just as he approached CO_2-related benefits, Mr. Meehan's testimony regarding transmission-related benefits simply points out that the projected transmission-related benefits from Turkey Point 6 & 7 are significant, and concludes that if one assumes these benefits completely vanish, or assumes they were cut in half, then Turkey Point 6 & 7 might not be cost-effective. Then, in his exhibits, he again uses these completely arbitrary assumptions and removes either 100% of transmission-related benefits or 50% of these benefits. As mentioned earlier, it is no surprise that when arbitrarily removing large blocks of projected benefits, the projected economics of projects such as Turkey Point 6 & 7 will decrease.

Q. What is your take on Mr. Meehan's approach to transmission-related benefits?

A. Regarding transmission-related benefits, he unfortunately uses the same approach he used regarding CO_2-related benefits in calculating the values he uses in his exhibits. He again makes unsupported, arbitrary assumptions that either remove 100% of the transmission-related benefits or cuts them in half.

Mr. Meehan's assumptions and calculations again fall far short of being either rigorous or reasonable.

Q. Please discuss Mr. Meehan's two exhibits in more detail.

A. Mr. Meehan presented two exhibits that appear to be designed to show that the Turkey Point 6 & 7 project is economically infeasible with a completely arbitrary reduction of CO_2- and transmission-related benefits. However, if one considers his testimony, then studies the exhibits, a different picture emerges.

One of his exhibits, ETM-2, is based on a 40-year operating life. Because his testimony is that he believes a new nuclear unit will operate for 60 years, this exhibit can be completely ignored which leaves the focus solely on his Exhibit ETM-3 which is based on a 60-year operating life. Taking into account another statement in his testimony that he believes it likely that there will be costs assigned to CO_2 during the operating lives of the new nuclear units, the second of the unnumbered columns in this exhibit can be ignored because it assumes 100% removal of the projected CO_2-related benefits.

One is then left with three remaining columns of his breakeven results in Exhibit ETM-3 to consider. Generally speaking, if the breakeven cost is above the high end of the non-binding cost estimate range, that scenario is projected to be economically feasible. If the breakeven cost falls within the range of non-binding cost estimates, that scenario is projected to be potentially

economically feasible. And if the breakeven cost falls below the low end of the non-binding cost estimate range, that scenario is projected to be economically infeasible.

Now let's look at what Mr. Meehan's results show for these three columns. In the first unnumbered column in which 100% of the transmission-related benefits are assumed to be removed, the "score" is: 3 feasible, 4 potentially feasible, and no infeasible. In the third unnumbered column in which 100% of the transmission-related benefits, and 50% of the CO_2-related benefits, are removed, the "score" is: 0 feasible, 6 potentially feasible, and 1 infeasible. Finally, in the last unnumbered column in which 50% of both the CO_2- and transmission-related benefits are removed, the "score" is: 1 feasible, 5 potentially feasible, and 1 infeasible.

Q. When these "scores" are summed, what is the outcome of Mr. Meehan's projections?

A. The total "score" is: 4 feasible, 15 potentially feasible and 2 infeasible. Stated another way, of the 21 possible outcomes, 19 were feasible or potentially feasible and only 2 were infeasible. Thus even with the arbitrary and unsupported massive reductions in projected benefits, Mr. Meehan's testimony and the outcome of his attempt at showing how infeasible Turkey Point 6 & 7 combine to show the opposite.

Q. Are there any other statements in Mr. Meehan testimony that contain errors or which are misleading?

A. Yes. There are at least two such statements.

Q. Please discuss the first statement.

A. Mr. Meehan states that *"The need for the first of those units* (i.e., Turkey Point 6 & 7) *has been delayed until 2027."* (Page 4, line 19 to Page 5, line 1) (Note that this same basic statement is made at several other places in his testimony.)

The year 2027 is not the first year that FPL has a need for new capacity. FPL's new capacity needs begin in the year 2019 as shown in FPL witness Brown's Exhibits ROB-3 and ROB-4, by the projected addition of a combined cycle unit in the year 2019. Instead, as discussed in the March 1, 2015 testimony of FPL witness Scroggs, 2027 represents the earliest practical deployment date for Turkey Point 6 & 7.

Q. Please discuss the second erroneous or misleading statement:

A. Mr. Meehan states - *"FP&L's economic analyses make it appear that the project is robust to the final cost."* (Page 20, lines 16 & 17)

I take this statement to mean that FPL is indicating that it has a definite view of both project costs and project benefits. FPL is clearly not indicating this. As FPL has stated from its Determination of Need filing through today, the feasibility analyses are based on projections, not established costs and benefits. This is seen by the structure of the feasibility analyses in which: (i) two resource plans, one plan with Turkey Point 6 & 7 (assuming no capital

cost for the two nuclear units), and one plan without, are constructed and compared; (ii) a set of breakeven capital costs are determined for all 14 scenarios, and (iii) these breakeven capital costs are then compared to FPL's range of projected construction costs. FPL's feasibility analysis approach is specifically designed to account for cost uncertainties at this stage of the project.

Q. Are there other statements or discussions in Mr. Meehan's testimony that you find problematic?

A. Yes. There are three statements that warrant responses.

Q. What is the first statement that you find problematic?

A. In the portion of his testimony in which he discusses his view of the reasonableness of future CO_2 costs, Mr. Meehan attempts to compare the CO_2 cost projection used in FPL's feasibility analyses to what he presents as increases in tuition costs at a particular university: *"In comparison, over a 43 year period from 1972 to the present, the cost of tuition at Harvard rose by three times that which would result from inflation alone."* (Page 13, line 19 through Page 14, line 2)

This attempted comparison is problematic in several ways. First, Mr. Meehan is attempting to compare historical known costs to projections of future unknown costs. Second, the two items being compared, college tuition costs versus air emission compliance costs represent a case of trying to compare apples and bricks. There is simply no connection between the two things

being compared. Third, 43 years ago it is unlikely that anyone could imagine the federal government imposing a cost on a gas that humans naturally exhale, and to do so in a way that seeks to fundamentally change entire industries. It is just as unlikely that Mr. Meehan today can state with any certainty that he knows what environmental compliance costs will be for CO_2, or for any other type of air emission that may be regulated in the future.

Q. What is the next statement that you take issue with?

A. Mr. Meehan also attempts an argument against the Turkey Point 6 & 7 project in the following statement: *"In this case, we have an investment that ... will only begin to break even on a present value basis 40 years after it enters service, in the late 2060s, or 50 years from today."* (Page 19, line 17 through Page 20, line 1)

By Mr. Meehan choosing to only take a present value perspective, he is ignoring other equally valid ways by which the benefits and costs of projects can be examined.

One of these ways is to look at annual nominal net costs or benefits that FPL's customers will incur. In response to interrogatory number 22 from the FPSC Staff in this docket, FPL provided a projection of the annual bill impact from the Turkey Point 6 & 7 project. This request, unlike the perspective chosen by Mr. Meehan, is based on how customers actually fare in their electric bills

each year if a project is selected. The results of this bill projection analysis were:

- FPL's customers are projected to have increased bills through 2035 (a total of 20 years from 2015), and
- FPL's customers will then have lower bills from that point through 2087 (a total of 52 years).

Thus FPL's customers are projected to begin to see lower bills each year beginning 9 years after the first of the two new nuclear units goes into service. Assuming a 60-year life for the new nuclear units means that customers are projected to receive lower electric bills for the vast majority of years the unit is operating.

This pattern of a project not resulting in net annual benefits to customers until a number of years have passed is common when utility resource options are added to a utility system. For example, let's take one of FPL's DSM programs: the Residential Air Conditioning program. In this DSM program, the average life of the air conditioner is projected to be 15 years. Using Mr. Meehan's perspective of looking only at cumulative present value of net benefits, this DSM program is projected to begin to show NPV benefits only in year 13. On the basis of his testimony, he would likely recommend against this cost-effective DSM program. However, when viewed from a nominal

annual net benefit perspective, customers are shown to begin realizing net annual benefits starting in year 5.

Another example is that of FPL's existing nuclear units. The bulk of their capital costs were paid for in prior years and customers today are benefiting each year from the net annual savings, primarily from lower fuel and environmental costs. The point is that each "generation" of electric customers, to varying degrees that are impossible to accurately predict, benefits from resource options and decisions made years, even decades, earlier and also pay the cost of current resource additions from which they may not fully realize commensurate benefits. The issue of what some refer to as "intergenerational equity" is not unique to nuclear power plant investments.

Q. What is the last of Mr. Meehan's statements that is problematic?

A. Mr. Meehan states: *"FPL has not looked at other non-carbon emitting technologies that are, in the long run, potentially more economic than new nuclear plants."* (Page 16, lines 12-14)

Mr. Meehan's rather vague statement neither identifies which non-carbon emitting technologies he is referring to, nor explains why he believes that these unnamed technologies may be "...potentially more economic..." than Turkey Point 6 & 7.

However, let's look at one non-carbon emitting technology that is applicable in Florida: photovoltaics (PV). Mr. Meehan appears to be unaware that FPL is actively pursuing PV applications. FPL announced in its 2015 Site Plan the planned installation of three PV facilities by the end of 2016. Each of these PV facilities is approximately 74 MW (nameplate) and they are being sited at locations which offer specific advantages. Thus FPL is already pursuing the most promising non-carbon zero-emission technology that is applicable in Florida.

However, FPL views PV as being complementary to new nuclear, not as an alternative to new nuclear. The reasons for this view include, but are not necessarily limited to, the following characteristics of Turkey Point 6 & 7: (i) 100% of Turkey Point 6 & 7's 2,200 MW are firm capacity that is available both Summer and Winter, (ii) Turkey Point 6 & 7 is projected to operate both day and night for approximately 90% of the hours in a year, and (iii) Turkey Point 6 & 7 will be built on a relatively small parcel of land that FPL already owns. PV does not share these characteristics.

FPL views new nuclear and PV as resource options which have different roles in FPL's resource plans, not as direct competitors. FPL is actively pursuing both of these resource options.

REBUTTAL TO DR. JACOBS

Q. Switching to Dr. Jacobs testimony, is there anything in Dr. Jacobs' testimony that you care to comment on?

A. Yes. The majority of Dr. Jacobs' testimony discusses his contention that FPL's projected non-binding cost estimate range is incorrect. FPL witnesses Scroggs and Reed address this in their rebuttal testimonies. However, there is one calculation that Dr. Jacobs presents that I will address from a resource planning perspective.

Q. Please identify and discuss this calculation.

A. Dr. Jacobs' calculation is found in his testimony starting on Page 12, line 7, and continuing on to Page 14, line 2. Dr. Jacobs' analysis approach can be summarized as follows:

- He starts with the projected breakeven cost for a particular scenario of fuel cost and environmental compliance costs.
- Then, not allowing any other cost to change, he increases the high end of the non-binding cost estimate range by a particular percentage value until the adjusted high end of the non-binding cost estimate range is now higher than the projected breakeven cost.
- He then concludes from that arithmetic that the new nuclear unit cannot be feasible with this particular capital cost increase.

Dr. Jacobs offers the following description of how his approach might work in practice in the following passage in his testimony: *"For example, considering*

the 40-year operating life case shown in FPL witness Brown's testimony, an increase of 7.91% in Turkey Point Units 6 and 7 capital costs results in no cases of feasibility. For the 60-year operating life case, an increase in capital costs of 36.7% results in no cases with feasibility." (Page 12, lines 11-14)

Arithmetically, such an analysis is very simple to produce. And, on first glance, may seem useful. However, such an approach is fundamentally flawed and cannot give meaningful results. Dr. Jacobs errs when he concludes in his testimony passage above that these calculations *"...results in no cases of feasibility."*

Q. Why is this calculation approach fundamentally flawed?

A. It is fundamentally flawed because the approach assumes that nothing – fuel costs, environmental compliance costs, future environmental regulation, load forecasts, costs of CC units, and all other assumptions and forecasts - changes from what has been currently assumed. The only assumption regarding future costs that is allowed to change is Dr. Jacobs' selection of nuclear capital costs. In other words, this approach assumes that every assumption and forecasted value through the year 2087 is perfectly known today and cannot change over the next 72 years, except for nuclear unit capital costs. For only that assumption is Dr. Jacobs free to alter future costs until he gets his desired result. Upon attaining this result, he puts down his pencil and declares that this analysis *"...results in no cases of feasibility."*

No one, including Dr. Jacobs, can know the future over the next 72 years with such certainty that they can categorically assume or conclude that none of the other assumptions and forecasts will change over that time period. For example, what if the cost of the Turkey Point 6 & 7 project increases, but so does the cost of natural gas due to new regulations on the commodity extraction processes, affecting the cost of all natural gas purchased in the market? There are many number of "what if" scenarios, and no one can accurately predict them all and reflect them all in an economic analysis. Therefore, Dr. Jacobs' statements that cost increases in nuclear capital costs of a certain percentage will result in Turkey Point 6 and 7 being not feasible are not reliable.

Q. Are there any statements made by Dr. Jacobs that you are in agreement with?

A. Yes. On page 18, lines 1 and 2, Dr. Jacobs states: *"...it would be unreasonable at this point for FPL not to continue the pursuit of obtaining its COL."* On that point, I will agree with Dr. Jacobs.

CONCLUSIONS

Q. In regard to the testimonies of Mr. Meehan and Dr. Jacobs, what conclusions do you draw?

A. My conclusions can be summarized as follows:

- Mr. Meehan's testimony essentially states that projected CO_2-related and transmission-related benefits for Turkey Point 6 & 7 are

significant and the FPSC should perform *"a thorough, in-depth evaluation"*. This statement simply ignores the fact that this is what the FPSC does each year in the annual NCR docket.

- Mr. Meehan provides no independent forecasts or analyses regarding CO_2 costs or transmission analyses that he believes are superior to those used in FPL's 2015 feasibility analyses.
- Instead, Mr. Meehan simply performs a couple of calculations in which he arbitrarily removes 50% or 100% of the CO_2-related benefits and/or the transmission-related benefits which, unsurprisingly, lowers the economic picture for Turkey Point 6 & 7. He offers no support or back up information regarding why these arbitrarily chosen percentage reductions in projected benefits are reasonable. When these calculations are reviewed critically in light of this testimony, the outcome actually supports the Turkey Point 6 & 7 project with the overwhelming majority of cases projected to be either feasible or potentially feasible.
- Dr. Jacobs' testimony contains a fundamentally flawed analysis approach which is based on the presumption of perfect knowledge of all assumptions and forecasts for the next 72 years. Then by his changing only the capital costs for Turkey Point 6 & 7 to a point where he gets a desired result, Dr. Jacobs tries to state with certainty that the new nuclear units cannot be feasible in the future.

For these, and other reasons discussed in my testimony, Mr. Meehan's and Dr. Jacobs' testimonies should not be relied upon by the FPSC.

Q. Does this conclude your testimony?

A. Yes.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 150009-EI
FLORIDA POWER & LIGHT COMPANY

IN RE: NUCLEAR POWER PLANT COST RECOVERY AMOUNT FOR THE YEAR 2016

REBUTTAL TESTIMONY OF:

JOHN J. REED

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

REBUTTAL TESTIMONY OF JOHN J. REED

DOCKET NO. 150009-EI

July 7, 2015

Q. Please state your name and business address.

A. My name is John J. Reed. My business address is 293 Boston Post Road West, Marlborough, Massachusetts 01752.

Q. Have you previously filed direct testimony in this proceeding?

A. Yes, I have.

Q. Please state the purpose of your rebuttal testimony.

A. I have been asked by Florida Power & Light Company ("FPL" or the "Company") to respond to two arguments made in the direct testimony of OPC witness William Jacobs, Jr. and an argument made in the testimony of the City of Miami's witness, Eugene Meehan.

Witness Jacobs recommends that the Florida Public Service Commission (the "Commission") require FPL to incorporate higher costs into its non-binding cost estimate for two new nuclear generating units at FPL's existing Turkey Point ("PTN") site. (The project to develop two new nuclear units is referred to herein as "PTN 6 & 7" or the "Project.") Witness Jacobs also attempts to impose a cost cap on the Project.

Witness Meehan recommends that the Commission perform a "thorough, in-depth evaluation" (page 9) of PTN 6 & 7. Mr. Meehan appears to

believe that such a review should extend over and above the Commission's systematic annual review that takes place in the Nuclear Cost Recovery Clause ("NCRC") proceeding.

Q. Please briefly describe the testimony that was filed by Witness Jacobs.

A. In his direct testimony, Witness Jacobs asserts that FPL's feasibility analysis for the PTN 6 & 7 project is flawed because it does not incorporate actual costs incurred by Westinghouse and Chicago Bridge and Iron ("CB&I"), contractors on the Vogtle and Summer projects, that are higher than those costs reported by the owners of Vogtle and Summer. Witness Jacobs acknowledges that "the precise amount of these additional costs is not publicly available," (page 9) and "it is also very difficult to quantify these additional costs that are being incurred by the contractor" (page 10). Despite these difficulties, Witness Jacobs recommends that FPL obtain binding bids from construction contractors, which he assumes will reflect the increased costs at Vogtle and Summer. Absent obtaining bids, Witness Jacobs recommends that FPL incorporate an estimate of those additional costs into its cost estimate. In providing these recommendations, Witness Jacobs states unequivocally that, "the capital costs to build Turkey Point Units 6 and 7 will be far greater than the publicly reported Vogtle and Summer owners' only costs that are currently being used by FPL in its feasibility analysis" (pages 11-12). His argument relies on the assumption that FPL will retain the same contractors to perform PTN 6 & 7 construction as have been used at the Vogtle and Summer sites, and that FPL will pursue the same contracting strategy that has been used for the Vogtle and Summer projects. Finally, Witness Jacobs recommends that after FPL has performed an updated

analysis, the capital cost estimate become a "not-to-exceed cost or cap above which FPL would not seek cost recovery from ratepayers for the Turkey Point Units 6 and 7 project" (page 19).

Q. Please summarize your conclusions regarding the direct testimony of OPC Witness Jacobs.

A. The Commission should reject Witness Jacobs's recommendation that the Commission require FPL to update the capital cost estimate used in FPL's feasibility analysis to account for increased costs incurred by contractors at the first-of-a-kind ("FOAK") U.S. AP1000 construction projects in development at the Vogtle and Summer sites. Witness Jacobs ignores cost and schedule improvements that are generally considered in the construction industry to occur between FOAK and subsequent projects using similar technology (also known as "nth-of-a-kind" or "NOAK" projects). Witness Jacobs also assumes that FPL will use CB&I as its module construction contractor for PTN 6 & 7, an assertion for which he provides no support. Finally, Witness Jacobs appears to assume that FPL will use an Engineering, Procurement, and Construction ("EPC") contracting approach for the PTN 6 & 7 Project that is identical to what has been used for the Vogtle and Summer projects. In fact, FPL has not decided whether it will pursue this approach and may select an alternative contracting strategy.

I also believe the Commission should reject Witness Jacobs's recommendation that the Commission impose a cap on the costs of PTN 6 & 7 that FPL can recover from ratepayers. Acceptance of that proposal could put

the Commission in a position in which it would disallow prudently-incurred costs from recovery, which is an outcome that the NCRC is intended to prevent.

Q. Has Witness Jacobs presented similar proposals in Nuclear Cost Recovery proceedings in the past?

A. Yes, and each time they were rejected by the Commission. In fact, OPC representatives have recommended some version of cost-capping, cost-sharing, or a hindsight-based opinion on prudence for FPL's Extended Power Uprate Project in 2010, 2011, 2012, and 2013. The Commission determined each time that the proposals were improper applications of the prudence standard and/or inconsistent with the Nuclear Cost Recovery statute's direction that all prudently incurred costs shall be allowed for recovery.

Q. Should the Commission require FPL to obtain binding bids from construction contractors, as Witness Jacobs recommends?

A. No. As described in the testimony of FPL Witness Scroggs, the Company has not made any determinations with regard to the contracting approach it will take for PTN 6 & 7. It would not be appropriate to seek contracting terms from vendors for a contracting approach that FPL may not pursue. In addition, it is highly unlikely that contractors would be willing to make any commitments in a formal bidding process at this stage of the PTN 6 & 7 Project's development. For a project of this scale, vendors would require a defined contract structure, a project development schedule, and approval from the Commission for the Project to move forward before they would be willing to submit any form of competitive, binding bids for engineering, procurement, or construction services.

Even if FPL were to seek binding bids for a form of a contract, it is unclear whether Witness Jacobs would consider the significant expense FPL would incur to obtain these bids to be related to FPL's costs to obtain a Combined Operating License ("COL") for the Project and, thus, available for current recovery from ratepayers.

Q. Absent binding bids from construction contractors, Witness Jacobs recommends on page 16 of his direct testimony that, "[a]t a minimum, the feasibility analysis should be corrected by FPL to reflect the higher costs experienced in the Vogtle and Summer projects including the owners' costs and an estimate of the contractor's costs related to the Vogtle and Summer projects." Do you agree?

A. No. Witness Jacobs's recommendation ignores the fact that schedule and budget performance between FOAK and NOAK projects tend to improve. For instance, the National Energy Technology Laboratory, in collaboration with the U.S. Department of Energy has stated that "subsequent installations will normally cost less than the first plant. Along with lower capital costs, efficiency and reliability will also tend to improve."[1] Specific to nuclear generation, the World Nuclear Association ("WNA") performed a survey in 2013 concerning the relationship between nuclear licensing and commercial activities undertaken during the development of new nuclear projects. In its summary report, the WNA stated that "[a]lmost all respondents who have had experience with a series of nuclear plants confirm that the schedule of the following units ('nth' units) is shorter than that of the first one. A country with significant experience

in this respect is France. In the US, the concepts of 'lead plants' and 'one issue, one review' help to generally shorten time schedules for all subsequent plants."[2]

Other studies demonstrate this concept as well. A 2004 report by the University of Chicago analyzed prior studies of "learning rates"– the proportional cost reduction resulting from doubling the number of plants built– for FOAK nuclear construction in both the United States and other countries. The study found that "reductions in capital costs between a first new nuclear plant and some nth plant of the same design can be critically important to eventual commercial viability" and estimates a learning rate of roughly 3 to 10 percent in the U.S.[3] A 2011 follow-up study reiterated these findings. According to the study team, "the total FOAKE [first-of-a-kind engineering] cost for GW-scale reactors is on the order of $800 million per design." If amortized in the cost of an initial plant, FOAKE costs represent roughly 11 percent of the total overnight capital cost estimate.[4]

Q. Do you agree with Witness Jacobs that a cap should be applied to FPL's recovery of costs related PTN 6 & 7?

A. No, I do not. Witness Jacobs's recommendation is inconsistent with the principles of the NCRC, and if it were accepted it could lead to the disallowance of costs that were otherwise determined to be prudently incurred. This would put FPL at risk for factors that are completely out of its control, which is a situation that is inconsistent with the NCRC.

Q. Why do you believe Witness Jacobs's recommendation is inconsistent with the NCRC?

A. The NCRC states that alternative cost recovery mechanisms shall "promote electric utility investment in nuclear or integrated gasification combined cycle power plants and allow for the recovery in rates of all such prudently-incurred costs."[5] There is no mention in the rule of a cost cap, over which prudently-incurred costs would no longer be available for recovery. In essence, Witness Jacobs's recommendation regarding the incorporation of a cost cap in the Commission's review process calls for a reversion to the highly unsuccessful all-or-nothing "used and useful" regulatory paradigm that prevailed in the 1980s.

Q. Please explain.

A. The regulatory processes applied to the development of nuclear generation in the 1980s were characterized by significant cost disallowances, at times owing to results-oriented hindsight reviews that determined whether plants turned out to be economical a decade or more after construction was begun. The standards used by regulators at that time evolved from traditional prudence reviews to include an "economically used and useful" standard that, based on hindsight, determined what portion of a plant's prudently-incurred cost was "economically" useful in providing service to customers. The recovery of prudently-incurred costs was further narrowed by the adoption of more onerous standards such as an "economic benefits test" and eventually simple "risk sharing," whereby costs were simply declared unrecoverable on the basis that the total cost was too large for customers alone to bear. By recommending a cost cap above which costs would presumably be disallowed for rate recovery regardless of the Commission's views on the prudence or imprudence of the decisions made by the utility, Witness Jacobs is essentially calling for a return to the prior paradigm.

The Nuclear Cost Recovery statute, however, strongly suggests that the Florida Legislature wished to provide a framework within which the Commission has the opportunity to address and avoid many flawed aspects of those past regulatory processes.

Q. How would a proper application of the prudence standard work?

A. A proper application of the prudence standard with regard to the allowance or disallowance of costs involves: (a) establishing the prudence or imprudence of management decision-making or actions, allowing the recovery of all prudently-incurred costs, and (b) if imprudence is established, determining which costs were higher than they would have been had management acted prudently and then disallowing those costs. Under this construct, the decision to continue with the project is simply one of the decisions for which a prudence review is appropriate based on all of the usual rules for such a review, including a prohibition on the use of hindsight to judge prudence.

Q. Please briefly describe the testimony that was filed by City of Miami Witness Meehan.

A. In his direct testimony, Witness Meehan recommends that the Commission perform an in-depth analysis of FPL's feasibility analysis to avoid a situation where "an investment such as Turkey Point units 6 and 7 is initially approved, that gradual investments are made over time, that despite changing circumstances continued creeping investments are made without a fundamental re-examination, that sunk costs build up, and that ultimately the plant is justifiably completed based on going forward cost analysis but results in much higher costs for

customers than the alternative because sunk costs that are ignored in the economic analysis are reflected in the rate base" (pages 6-7).

Q. Do you share Witness Meehan's concern regarding the need for an in-depth analysis of FPL's feasibility analysis?

A. No, for two reasons. First, the review Mr. Meehan suggests is already taking place. The Commission is currently afforded and makes use of such an in-depth analysis in the annual NCRC process. The NCRC was established to provide ongoing reviews of the management of nuclear development projects such as PTN 6 & 7. The annual NCRC proceedings have provided an opportunity for exactly the kind of assessment Mr. Meehan describes for the past seven years, and will continue to do so throughout the entire period of PTN 6 & 7 development.

In addition, the issue that Witness Meehan describes (*i.e.*, the accumulation of sunk costs that are determined to be justifiable but that are ignored in periodic economic analyses) is more relevant to after-the-fact prudence reviews such as those I described above from the 1980s era. The risk that concerns Witness Meehan is greatly diminished through regulatory processes such as the NCRC, in which annual reviews allow the utility, intervenors, and this Commission to systematically evaluate the economics of a project.

Q. Does this conclude your testimony?

A. Yes, it does.

Endnotes:

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[1] National Energy Technology Laboratory/U.S. Department of Energy, "Quality Guidelines for Energy System Studies: Technology Learning Curve (FOAK to NOAK)," August 2013.

[2] World Nuclear Association, "Licensing and Project Development of New Nuclear Plants," January 2013.

[3] The University of Chicago, "The Economic Future of Nuclear Power", August 2004.

[4] The University of Chicago, "Analysis of GW-Scale Overnight Capital Costs", November 2011.

[5] Nuclear Power Plant Cost Recovery Rule, Section 25-6.0423, F.A.C.

CERTIFICATE OF SERVICE
DOCKET NO. 150009-EI

I HEREBY CERTIFY that a true and correct copy of the foregoing rebuttal testimony of S. Scroggs, S. Sim, and J. Reed was served by electronic mail this 7th day of July, 2015 to the following:

Martha F. Barrera, Esq.
Kyesha Mapp, Esq.
Division of Legal Services
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, Florida 32399-0850
mbarrera@psc.state.fl.us
kmapp@psc.state.fl.us

J.R. Kelly, Esq.
Charles R. Rehwinkel, Esq.
Patricia A. Christensen, Esq.
Erik L. Sayler, Esq.
Associate Public Counsel
Office of Public Counsel
The Florida Legislature
111 West Madison Street, Room 812
Tallahassee, Florida 32399
kelly.jr@leg.state.fl.us
rehwinkel.charles@leg.state.fl.us
christensen.patty@leg.state.fl.us
sayler.erik@leg.state.fl.us
Attorney for the Citizens of the State of Fla.

J. Michael Walls, Esq.
Blaise N. Gamba, Esq.
Carlton Fields Jorden Burt, P.A.
P.O. Box 3239
Tampa, Florida 33601-3239
mwalls@cfjblaw.com
bgamba@cfjblaw.com
Attorneys for Duke Energy Florida, Inc.

Dianne M. Triplett, Esq.
299 First Avenue North
St. Petersburg, Florida 33701
dianne.triplett@duke-energy.com
Attorney for Duke Energy Florida, Inc.

Matthew Bernier, Esq., Sr. Counsel
106 East College Ave., Suite 800
Tallahassee, Florida 32301-7740
Matthew.bernier@duke-energy.com
Attorney for Duke Energy Florida, Inc.

James W. Brew, Esq.
Owen J. Kopon, Esq.
Laura A. Wynn, Esq.
Brickfield, Burchette, Ritts & Stone, P.C.
1025 Thomas Jefferson Street, N.W.
8th Floor, West Tower
Washington, D.C. 20007
jbrew@bbrslaw.com
owen.kopon@bbrslaw.com
laura.wynn@bbrslaw.com
Attorneys for White Springs Agricultural Chemicals, Inc., d/b/a PCS Phosphate-White Springs

Robert Scheffel Wright, Esq.
John T. LaVia, III, Esq.
Gardner Bist Bowden Bush Dee
LaVia & Wright, P.A.
1300 Thomaswood Drive
Tallahassee, FL 32308
Schef@gbwlegal.com
Jlavia@gbwlegal.com
Attorneys for the Florida Retail Federation

Victoria Méndez, City Attorney
Matthew Haber, Assistant City Attorney
City of Miami
444 Southwest 2nd Avenue
Miami, FL 33130
vmendez@miamigov.com
mshaber@miamigov.com
aidagarcia@miamigov.com (secondary email)
Attorneys for City of Miami

George Cavros, Esq.
120 E. Oakland Park Blvd., Suite 105
Fort Lauderdale, FL 33334
george@cavros-law.com
Attorney for Southern Alliance for Clean Energy

Jon C. Moyle, Jr., Esq.
Moyle Law Firm, P.A.
118 North Gadsden Street
Tallahassee, Florida 32301
jmoyle@moylelaw.com
Attorney for Fla. Industrial Power Users Group

By: *s/ Jessica A. Cano*
Jessica A. Cano
Fla. Bar No. 0037372