


United States Nuclear Regulatory Commission Official Hearing Exhibit	
In the Matter of:	DUKE ENERGY FLORIDA, LLC (Levy Nuclear Plant, Units 1 and 2) Commission Mandatory Hearing
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Exhibit DEF-001

July 20, 2016

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Commission

In the Matter of )  
 )  
Duke Energy Florida, LLC ) Docket Nos. 52-029 and 52-030  
 )  
(Levy Nuclear Plant, Units 1 and 2) )

DUKE ENERGY FLORIDA’S CORRECTED PRE-FILED TESTIMONY  
IN SUPPORT OF THE MANDATORY HEARING FOR  
THE LEVY NUCLEAR PLANT UNITS 1 AND 2 COMBINED LICENSES

I. WITNESS FOR THE UNCONTESTED HEARING

Q1. Please State your full name.

A1. My name is Robert H. Kitchen. I am the Director - Licensing, Nuclear Development for Duke Energy Florida, Inc. (“DEF”) formerly Progress Energy Florida, Inc. I have overall responsibility for the development of the Levy Nuclear Plant (“LNP”) Units 1 and 2 Combined License Application (“LNP COLA”) and other State and Federal permits and approvals. My business address is EC12L, P.O. Box 1006, Charlotte, NC 28201-1006.

Q2. Please describe your educational and professional background.

A2. I earned a Bachelor of Science degree in Engineering from Tulane University in 1973 and a Master’s degree in Business Administration from UNC-Wilmington in 1997. I have worked at Carolina Power and Light Co. (“CPL”), Progress Energy Inc. (“PGN”) and Duke Energy Corporation for 35 years (I will refer to CPL, PGN and Duke Energy Corporation collectively as “Duke”). I have 43 years of experience in nuclear power plant operations and engineering in the areas of licensing, engineering projects, plant operations and maintenance. I have experience

with the various aspects of licensing nuclear power plants, including the applicable regulatory requirements, policies, and practices. I represented Duke in the NuStart Design Centered Working Group (“DCWG”) for the AP1000 reactor, and am currently a member of the AP1000 Owners Group (a group consisting of utilities that have selected the AP1000 design). My *curriculum vitae* is provided as Exhibit DEF000002.

**Q3. What is the purpose of your testimony?**

**A3.** The purpose of my testimony is to support the findings that the Commission must make as part of the mandatory hearing on uncontested issues in the LNP COLA proceeding.

## **II. BACKGROUND**

**Q4. Please briefly describe DEF’s COL Application for LNP Units 1 & 2.**

**A4.** DEF filed its COLA for LNP Units 1 and 2 on July 28, 2008. The LNP COLA has been updated and revised since the initial filing, most recently on April 6, 2016. The LNP COLA seeks a combined license (“COL”) under 10 C.F.R. Part 52 to construct and operate two Westinghouse Electric Company (“Westinghouse”) AP1000 advanced passive pressurized water reactors. These new reactors are formally designated as Levy Nuclear Plant Units 1 and 2. The LNP COLA includes a request for associated material licenses under 10 C.F.R. Parts 30, 40, and 70.

The LNP COLA incorporates by reference the Design Certification Rule for the AP1000 Design, Appendix D to 10 C.F.R. Part 52, as amended on December 22, 2011, which certifies Westinghouse’s AP1000 Design Control Document (“DCD”), Revision 19.

**Q5. Please describe the ownership of LNP Units 1 and 2.**

**A5.** DEF will be the sole owner of LNP Units 1 and 2 and will retain full responsibility for operation of the new units after the requirements of 10 C.F.R. § 52.103(g) are satisfied. DEF is an indirect wholly-owned subsidiary of Duke Energy Corporation, Inc., the largest electric power holding company in the United States. DEF is not owned, controlled, or dominated by an alien, foreign corporation, or foreign government.

**Q6. Can you briefly describe how the COLA is organized?**

**A6.** The LNP COLA is composed of eleven parts. Each of these is identified below, along with the current revision of each part:

- Part 1 – General and Administrative Information (Revision 8)
- Part 2 – Final Safety Analysis Report (“FSAR”) (Revision 9)
- Part 3 – Environmental Report (“ER”) (Revision 1)
- Part 4 – Technical Specifications (Revision 7)
- Part 5 – Emergency Plan (Revision 7)
- Part 6 – Limited Work Authorization (Revision 1)
- Part 7 – Departures and Exemptions (Revision 6)
- Part 8 – Safeguards/Security Plans (withheld from public availability) (Revision 3)
- Part 9 – Other Withheld Information (financial and safeguards information) (Revision 8)
- Part 10 – Proposed License Conditions and Inspections, Tests, Analyses, and Acceptance Criteria (“ITAAC”) (Revision 8)
- Part 11 – Enclosures (Revision 7).

**Q7. What is the significance of the fact that the LNP COLA is not the first COLA to reference the AP1000 DCD?**

**A7.** In 2006, the NRC Staff (“Staff”) described its “design-centered review approach” (“DCRA”) in Regulatory Issue Summary 2006-06. The Staff discussed the potential efficiencies to be realized from increased standardization and coordination of approaches, stating that:

In order for the DCRA to be fully effective, it is essential that applicants referencing a particular design standardize their applications to the maximum extent practicable (standardize design features, analyses, assumptions, and methods) such that the technical review and decisions are made against a standard application, known as the reference COL (R-COL) application. If this is done, those decisions will be applicable to subsequent COL (S-COL) applications that reference the standard. The NRC’s DCRA uses the DC review or the review of the R-COL as the basis for acceptance. The DC or R-COL application review will identify those technical areas to be considered standard for a given design . . . . S-COL applicants who use the standard application and actively work with the R-COL applicant to standardize will significantly benefit from the DCRA and the goal of having “one issue, one review, one position” for multiple COL applications.

NRC Regulatory Issue Summary 2006-06, “New Reactor Standardization Needed to Support the Design-Centered Licensing Review Approach,” at 2 (May 31, 2006). The Commission embraced the process recommended by the Staff in its Final Policy Statement on “Conduct of New Reactor Licensing Proceedings,” 73 Fed. Reg. 20,963 (Apr. 17, 2008).

Here, the LNP COLA is a “Subsequent COLA” (or “S-COLA”) since it incorporates the standard plant material of the COLA submitted by Southern Nuclear Operating Company for Vogtle Units 3 and 4, the “R-COLA,” which also referenced the AP1000 DCD. Following the DCRA approach, DEF has adopted the R-COLA’s resolution of standard plant licensing issues except to the extent required to satisfy site-specific requirements and significant AP1000 issues identified during detailed design activities supporting lead plant construction. Since DEF has implemented the DCRA approach, “no further staff review of the adequacy of the approach [of such common issues] is necessary” and the Staff’s review of the LNP COLA with respect to such

matters is “limited to verification that [DEF] has indeed adopted the previously approved approach and will properly implement it, and, for technical issues that depend on site-specific factors, that the previously-approved approach applies to the applicant’s proposed facility.” *Id.* at 20,973.

**Q8. What effect does incorporating the AP1000 DCD, Revision 19, have on the Staff’s review of the LNP COLA?**

**A8.** Incorporating the AP1000 DCD, Revision 19, by reference narrows considerably the scope of issues that the Commission needs to consider before issuing the COLs. Under the NRC rules at § 52.63(a)(5), except as provided in 10 C.F.R. § 2.335, in making the findings required for issuance of a combined license, the Commission treats as resolved those matters resolved in connection with the issuance of a design certification rule. Accordingly, safety issues within the scope of the AP1000 DCD, Revision 19, are addressed in DEF’s testimony in this mandatory hearing only to the extent that DEF submitted departures for certified information to address certain significant emergent AP1000 issues.

**Q9. Does the LNP COLA contain any exemptions from NRC regulations?**

**A9.** Yes. The LNP COLA contains seven exemptions from NRC regulations. The first exemption is a non-substantive exemption from certain COLA organization and numbering requirements in 10 C.F.R. § 52, Appendix D, Section IVA.2.a. The NRC Staff determined that the exemption is authorized by law, will not present an undue risk to public health or safety, and is consistent with the common defense and security, and that special circumstances are present as described in 10 C.F.R. § 50.12(a)(2)(ii) because application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule.

The second is an exemption from certain Material Control and Accounting (“MC&A”) requirements in 10 C.F.R. Part 74 so that the same requirements apply to Part 52 licensees as apply to Part 50 licensees. Similar exemptions have been granted for previously issued COLs. The NRC Staff determined that the exemption is authorized by law, will not present an undue risk to public health or safety, and is consistent with the common defense and security, and that special circumstances are present as described in 10 C.F.R. § 50.12(a)(2)(ii) because the application of the regulation in these particular circumstances is not necessary to achieve the underlying purpose of the rule. The NRC Staff agreed that nuclear reactors licensed under 10 C.F.R. Part 52 should be treated the same as the reactors licensed under 10 C.F.R. Part 50 regarding the MC&A for special nuclear material (“SNM”).

The third exemption request is from 10 C.F.R. Part 52 Appendix D, Section III.B, which requires a COL applicant to incorporate and comply with the elements of the certified design including Tier 1 information and generic Technical Specifications (“TS”). This exemption request is necessary to add additional components to the condensate return design to enable the Passive Core Cooling System to more effectively perform its design function and revise a TS to address downspout screens. The NRC Staff determined that the exemption is authorized by law, will not present an undue risk to public health or safety, and is consistent with the common defense and security, and that special circumstances are present as described in 10 C.F.R. § 50.12(a)(2)(ii) because application of the Tier 1 information is not necessary to achieve the underlying purpose of the rule. Furthermore, as required by 10 C.F.R. § 52.63(b)(1), the NRC Staff found that the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption because the exemption modifying the condensate return

portion of the passive core cooling system will improve the reliability and effectiveness of the condensate return system, to better allow the system to perform its intended function.

The fourth exemption request is from 10 C.F.R. Part 52 Appendix D, Section III.B, which requires a COL applicant to incorporate and comply with the elements of the certified design including Tier 1 information and generic TS. Site-specific revisions to the AP1000 design and associated dose consequence analyses presented in DCD Revision 19 are required to ensure that operator dose following a DBA is maintained below the limit in the General Design Criteria (“GDC”) for the duration of the event. These include revising Tier 1 information to add information on ITAAC related to the radiation shielding below the Main Control Room (“MCR”) Emergency Habitability System (“VES”) filter and reflect a change to the name of the actuation signal for isolating the MCR penetrations and initiating the VES, and changing generic TS to lower the allowable value for secondary coolant iodine activity concentration. The NRC Staff determined that the exemption is authorized by law, will not present an undue risk to public health or safety, and is consistent with the common defense and security, and that special circumstances are present as described in 10 C.F.R. § 50.12(a)(2)(ii) because application of the Tier 1 information is not necessary to achieve the underlying purpose of the rule. Furthermore, as required by 10 C.F.R. § 52.63(b)(1), the NRC Staff found that the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption because adding shielding to the VES filter will improve the reliability and effectiveness of the MCR and associated heating, ventilation, and air conditioning (“HVAC”) systems, to better allow the MCR and the VES to perform their intended functions with respect to radiological habitability.

The fifth exemption request is from 10 C.F.R. Part 52 Appendix D, Section III.B, which requires a COL applicant to incorporate and comply with the elements of the certified design including Tier 1 information. Changes are made to ensure the VES design functions to: 1) maintain heat loads within the main control room envelope (“MCRE”) within design basis assumptions to limit the heat-up of the room, 2) ensure a 72-hour supply of breathable quality air for the occupants of the MCRE, 3) maintain the MCRE pressure boundary at a positive pressure with respect to the surrounding areas with a discharge of air through the main control room vestibule, and 4) provide a passive recirculation flow of MCRE air to maintain MCR dose rates below an acceptable level during VES operation. The NRC Staff determined that the exemption is authorized by law, will not present an undue risk to public health or safety, and is consistent with the common defense and security, and that special circumstances are present as described in 10 C.F.R. § 50.12(a)(2)(ii) because application of the Tier 1 information is not necessary to achieve the underlying purpose of the rule. Furthermore, as required by 10 C.F.R. § 52.63(b)(1), the NRC Staff found that the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption because the exemption modifying the VES will result in no reduction in the level of safety.

The sixth exemption request is from 10 C.F.R. Part 52 Appendix D, Section III.B, which requires a COL applicant to incorporate and comply with the elements of the certified design including Tier 1 information. Acceptance criteria for hydrogen venting inside containment are revised for consistency with the current regulatory design of the plant. The NRC Staff determined that the exemption is authorized by law, will not present an undue risk to public health or safety, and is consistent with the common defense and security, and that special circumstances are present as described in 10 C.F.R. § 50.12(a)(2)(ii) because application of the Tier 1 information is not



necessary to achieve the underlying purpose of the rule. Furthermore, as required by 10 C.F.R. § 52.63(b)(1), the NRC Staff found that the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption because modifying the ITAAC acceptance criteria for combustible gas control will allow for application of acceptance criteria that are appropriate to evaluate a plant built according to the current detailed design, does not reduce the design margins of the Containment Hydrogen Control System, and will result in no reduction in the level of safety.

The seventh exemption request is from 10 C.F.R. Part 52 Appendix D, Section III.B, which requires a COL applicant to incorporate and comply with the elements of the certified design including generic TS. A permissive to the source range flux doubling function to prevent bypassing the chemical and volume control system makeup isolation actuation upon a source range flux doubling is added to more effectively perform its design function and provide reactor protection as analyzed. This change includes adding the permissive to the instrument Table in the TS. The NRC Staff determined that the exemption is authorized by law, will not present an undue risk to public health or safety, and is consistent with the common defense and security, and that special circumstances are present as described in 10 C.F.R. § 50.12(a)(2)(ii) because application of the requirements in the generic TS Table 3 is not necessary to achieve the underlying purpose of the rule.

**Q10. Does DEF COLA contain any departures from the AP1000 DCD?**

**A10.** Yes. As described in Section A of Part 7 of the COLA, DEF seeks approval of eleven departures from the AP1000 certified design. Two of these departures are standard departures sought by plants referencing the AP1000 design. The first standard departure (STD DEP 1.1-1)

is a non-substantive administrative departure for organization and numbering of the FSAR sections. The second standard departure (STD DEP 8.3-1) is a departure regarding the Class 1E voltage regulating transformer current limiting features. Additional details regarding these standard departures are provided in Section A of Part 7 of the COLA.

The third departure (LNP DEP 1.8-1) corrects a citation in an interface description in the DCD. The fourth departure (LNP DEP 3.2-1) is related to the previously-described exemption request for the changes to the condensate return portion of the Passive Core Cooling System. This departure makes modifications to Tier 2 designs for the Polar Crane Girder, Internal Stiffener, and Passive Core Cooling System gutters as described in Section A of Part 7 of the LNP COLA. The fifth departure (LNP DEP 3.7-1) permits use of drilled shafts in the foundation design for the Annex and Turbine building, which differs from the soil profiles analyzed in the AP1000 generic seismic analysis and applies site-specific response spectra to calculate horizontal loads and displacement for this drilled shaft foundation. The sixth departure (LNP DEP 3.11-1) is a correction to the “Envir. Zone” numbers for Spent Fuel Pool Level instruments to be consistent with the actual designed locations identified on Westinghouse design documents. The seventh departure (LNP DEP 6.2-1) is a correction to the ITAAC acceptance criteria for the in-containment compartment vents to reflect the as-designed plant configuration. The eighth departure (LNP DEP 6.3-1) is made to more accurately describe the long-term cooling capability of the Passive Residual Heat Removal Heat Exchanger in a closed-loop mode of operation. The ninth departure (LNP DEP 6.4-1) is to correct the AP1000 design and associated dose consequence analyses presented in DCD Revision 19 to ensure that operator dose following a DBA is maintained below the GDC limit for the duration of the event. The tenth departure (LNP DEP 6.4-2) makes changes to ensure that the VES can perform its design functions and ensure

that Main Control Room habitability and environmental qualification requirements are met in the most limiting event scenario. The eleventh departure (LNP DEP 7.3-1) makes changes to ensure compliance with IEEE 603 by incorporating an operating bypass permissive to prevent blocking the Source Range nuclear instrumentation flux doubling function, or actuating the function when the conditions are not met.

**Q11. Please describe DEF's request in the COLA for a Part 30, 40, and 70 license.**

**A11.** The LNP COLA includes a request for a license to receive, store, or use byproduct, source, or special nuclear material (under 10 C.F.R. Parts 30, 40, and 70 respectively). These licenses will allow DEF to possess and use nuclear fuel, radiological waste materials, and various radiological sources used for operational purposes.

**Q12. Was there a review of the LNP COLA by the Advisory Committee on Reactor Safeguards ("ACRS")?**

**A12.** Yes. The ACRS provided an independent review and report to the Commission regarding the LNP COLA. On December 7, 2011, the ACRS issued a letter on its review of the LNP COLA, concluding that "[t]here is reasonable assurance that LNP, Units 1 and 2, can be built and operated without undue risk to the health and safety of the public subject to the recommendations below. The [DEF] COLA for LNP should be approved following implementation of these recommendations." Report on the Safety Aspects of the Progress Energy Florida, Inc. Combined License Application for Levy Nuclear Plant, Units 1 and 2, at 2 (December 7, 2011). On January 18, 2013, the ACRS AP1000 Subcommittee reviewed the LNP reevaluation of seismic hazards undertaken in response to Fukushima recommendations. On April 18, 2016, the ACRS issued a further letter report on the "Exemptions to the AP1000 Certified Design Included in the Levy Nuclear Plant Units 1 and 2 Combined License

Application” concluding that the five exemptions addressing the emergent design issues “are needed to enable the certified design to perform intended functions and should be approved.”

**Q13. Did the NRC Staff document its safety and environmental reviews?**

**A13.** Yes. The NRC Staff documented its safety review in the “Final Safety Evaluation Report for Combined Licenses for Levy Nuclear Plant Units 1 and 2,” dated May 2016, concluding that there is “reasonable assurance that the facility will be constructed and will operate in conformity with the license, the provisions of the Atomic Energy Act, and the Commission’s regulations.”

In April 2012, the Staff issued the Final Environmental Impact Statement (“FEIS”) for LNP Units 1 and 2, concluding that “[t]he NRC staff’s recommendation to the Commission related to the environmental aspects of the proposed action is that the COLs should be issued.” NUREG-1941, “Final Environmental Impact Statement for Combined Licenses (COLs) for Levy Nuclear Plant Units 1 and 2,” at 10-30 (Apr. 2012).

**Q14. What safety findings must the Commission make under Part 52 in order to issue a COL to DEF?**

**A14.** Under 10 C.F.R. § 52.97(a), the Commission may issue a COL if it finds that:

- The applicable standards and requirements of the Atomic Energy Act (“Act”) and the Commission’s regulations have been met;
- Any required notifications to other agencies or bodies have been duly made;
- There is reasonable assurance that the facility will be constructed and will operate in conformity with the license, the provisions of the Act, and the Commission’s regulations;

- The applicant is technically and financially qualified to engage in the activities authorized;
- Issuance of the license will not be inimical to the common defense and security or to the health and safety of the public; and
- The findings required by 10 C.F.R. Part 51, Subpart A, have been made.

**Q15. What are the environmental findings required by Part 51?**

**A15.** Under 10 C.F.R. § 51.107, the Commission must do the following:

- Determine whether the requirements of Sections 102(2) (A), (C), and (E) of the National Environmental Policy Act (“NEPA”) and the regulations in 10 C.F.R. Part 51, Subpart A, have been met;
- Independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken;
- Determine, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, whether the COL should be issued, denied, or appropriately conditioned to protect environmental values; and
- Determine whether the NEPA review conducted by the Staff has been adequate.

**Q16. Does the LNP COLA, and the NRC Staff’s review of the COLA, meet the standards identified above?**

**A16.** Yes. The basis for the Commission to make each of the relevant safety and environmental findings required under 10 C.F.R. §§ 52.97 and 51.107 is described below.

### **III. DISCUSSION**

#### **10 C.F.R. § 52.97(a)(1)(i)**

**Q17. Have the applicable standards and requirements of the Act and the Commission's regulations been met?**

**A17.** Yes. The LNP COLA was based on NRC regulations and applicable portions of relevant Standard Review Plans ("SRP"), Interim Staff Guidance ("ISG"), Regulatory Guides ("Reg. Guides"), bulletins, generic letters, and other NUREGs. The primary SRPs for the LNP COL review were NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants (LWR [Light Water Reactor] Edition)" (safety review) and NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Environmental Standard Review Plan" (environmental reviews). The NRC Staff reviewed the COLA and evaluated it against the applicable regulations in 10 C.F.R. Parts 20, 26, 30, 31, 32, 40, 50, 51, 52, 55, 70, 73, 74, 100, and 140. The NRC Staff considered applicable portions of the SRP, ISGs, Reg. Guides, bulletins, generic letters, and other NUREGs. Based on the COLA and the NRC Staff's review, documented in the FSER and the FEIS, DEF concludes that, for the purpose of issuing the LNP Unit 1 & 2 COL, the applicable standards and requirements of the Atomic Energy Act ("AEA") and the Commission's regulations have been met.

#### **10 C.F.R. § 52.97(a)(1)(ii)**

**Q18. Have the required notifications to other agencies or bodies been duly made?**

**A18.** Yes. As required by Section 182(c) of the AEA and 10 C.F.R. § 50.43(a), the NRC notified the Florida Public Service Commission and the Federal Energy Regulatory Commission of the LNP COL application. In addition to publishing a notice of the LNP COLA in the *Federal*

*Register*,<sup>1</sup> the NRC also published notices of the application in the following area and local news publications: the Citrus County Chronicle, Ocala Star Banner, Chiefland Citizen, and Nature Coast Newscaster. Required notifications to other agencies or bodies have been made.

**10 C.F.R. § 52.97(a)(1)(iii)**

**Q19. Is there reasonable assurance that the facility will be constructed and will operate in conformity with the license, the provisions of the Act, and the Commission’s regulations?**

**A19.** Yes. The LNP COLA, which incorporates the AP1000 DCD, provides critical aspects of construction and operation of LNP Units 1 and 2. This information includes the AP1000 DCD, which is incorporated by reference, the general and financial information section of the application, technical specifications, the emergency plan, the quality assurance (“QA”) plan, and the physical security plan. These materials demonstrate that there is reasonable assurance that LNP Units 1 and 2 can be built and operated in compliance with the COL, the AEA, and the NRC’s regulations.

**Q20. What actions did the NRC Staff take to satisfy itself that the plant could be constructed and operated safely?**

**A20.** In addition to reviewing the COLA material provided by DEF, the NRC Staff issued Requests for Additional Information (“RAIs”). The RAIs sought additional information or clarifications in order to develop sufficient information for the NRC Staff to make a reasonable assurance finding. The NRC Staff also conducted audits and inspections of DEF’s records and documentation, and performed confirmatory calculations, in order to confirm information or conclusions made by DEF.

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<sup>1</sup> 73 Fed. Reg. 60,726 (Oct. 14, 2008); *see also* Progress Energy Florida, Inc., Levy Nuclear Power Plant Units 1 and 2, Combined License Application and Limited Work Authorization; Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process, 73 Fed. Reg. 63,517 (October 24, 2008).

**Q21. How does the NRC Staff ensure that the bases for its reasonable assurance finding will be maintained in the future?**

**A21.** The NRC Staff developed draft license conditions and ITAAC for LNP Units 1 & 2. The draft COL identifies proposed license conditions, including conditions related to the Fukushima Near-Term Task Force Recommendations, and ITAAC. The basis for each license condition or ITAAC appears in the technical evaluations in the LNP COLA.

**Q22. Did the NRC Staff reach a “reasonable assurance” conclusion with respect to the LNP COLA?**

**A22.** Yes. The NRC Staff concluded based on its safety and environmental reviews, documented in the “Final Safety Evaluation Report for Combined Licenses for Levy Nuclear Plant Units 1 and 2” (May 2016) (“FSER”) and FEIS, respectively, that there is reasonable assurance that the facility will be constructed and will operate in conformance with the license, the provisions of the Atomic Energy Act and the Commission’s regulations.

**Q23. Do you agree with the NRC Staff’s conclusions?**

**A23.** Yes.

**10 C.F.R. § 52.97(a)(1)(iv)**

**Q24. Is DEF technically qualified to engage in the activities authorized by the COL?**

**A24.** Yes. DEF has the longstanding engineering and management experience (including operations, engineering, and other functions) to be technically-qualified to engage in construction and operation of LNP Units 1 and 2. The LNP Unit 1 and 2 project is part of Duke Energy’s Nuclear Development organization. Duke Energy is the largest electric power company in the United States and operates eleven nuclear units at six nuclear stations (and until



recently, a twelfth at the Crystal River complex). Duke Energy has over 40 years of experience in the design, construction, and operation of nuclear generating stations.

**Q25. Did the NRC Staff conclude that DEF was technically qualified to engage in the activities authorized by the COL?**

**A25.** Yes. As documented in the NRC Staff's FSER, the NRC Staff evaluated DEF's experience, organizational structure, and QA program. The NRC Staff found that "Based on DEF's experience with building and operating a nuclear power plant and the staff's evaluation of DEF's QA program, the staff finds that DEF is technically qualified to hold a 10 C.F.R. Part 52 license in accordance with 10 CFR 52.97(a)(1)(iv)."

**Q26. Is DEF financially qualified to engage in the activities authorized by the COL?**

**A26.** Yes. DEF provided information in the COLA to demonstrate its financial qualifications, including information regarding cost of construction and operation of LNP Units 1 and 2, and decommissioning funding assurance. DEF is an electric utility as defined in the NRC rules recovering its costs through cost-of-service based rates. In 2006, Florida enacted legislation that included cost recovery mechanisms supportive of nuclear plant investment and in 2007, the Florida Public Service Commission approved a new rule that allows DEF to recover prudently incurred siting, preconstruction costs and allowance for funds used during construction on an annual basis. The decommissioning funding amount will be covered by DEF through an external sinking fund. DEF will collect decommissioning funding contributions through regulated, cost-of-service based rates.

**Q27. Did the NRC Staff conclude that DEF was financially qualified to engage in the activities authorized by the COL?**

**A27.** Yes. The NRC Staff reviewed the information provided by DEF. The NRC Staff evaluated the information pertaining to the total cost of LNP Unit 1 and 2, consisting of engineering, procurement, construction costs, owners' costs, financing costs, inflation and information pertaining to funding sources. The NRC Staff also considered regulations and guidance related to financial protection requirements and indemnity agreements, sources of funds for construction, financial qualifications, and decommissioning funding assurance. The NRC Staff's evaluation is in FSER Chapter 1. Based on its review, the NRC Staff found that DEF has demonstrated that it possesses or has access to the financial resources necessary to meet estimated construction costs and related fuel cycle costs and therefore is financially qualified to construct the facilities. As an electric utility recovering its costs of generating electricity through regulated rates, DEF is not required to provide financial qualifications information related to operating cost recovery.

**10 C.F.R. § 52.97(a)(1)(v)**

**Q28. Will issuance of the license be inimical to the common defense and security or to the health and safety of the public?**

**A28.** No. DEF provided information, analysis, and conclusions regarding site-specific conditions, including geography and demography of the site; nearby industrial, transportation, and military facilities; site meteorology; site hydrology; and site geology, seismology, and geotechnical engineering to ensure that issuance of the license will not be inimical to public health and safety. In addition to a review of that information, the NRC Staff also evaluated the design of structures, systems, and components to ensure safe operation, performance, and shutdown when subjected to extreme weather, floods, seismic events, missiles (including aircraft

impacts), chemical and radiological releases, and loss of offsite power to the extent not already resolved by the incorporation of the AP1000 design.

**Q29. What did the NRC Staff conclude based on that review?**

**A29.** The review confirmed that radiological releases and human doses during both normal and design basis accident scenarios will remain within regulatory limits, which supports the NRC Staff's conclusion that issuance of the license will not be inimical to public health and safety. The review also determined that the physical security to be implemented at the site is adequate to protect the facility, which supports the NRC Staff's conclusion that issuance of the licenses will not be inimical to the common defense and security.

**Q30. What about operational programs?**

**A30.** The NRC Staff evaluation included the operational programs identified in the Staff Requirements Memorandum for SECY-05-0197, dated February 22, 2006, as well as additional operation programs, including a cybersecurity program, a program for SNM MC&A, and a SNM physical security program. These programs are listed in the LNP Unit 1 and 2 FSAR at Table 13.4-201, Operational Programs Required by NRC Regulations. The NRC Staff's review determined that the operational programs identified by DEF are sufficiently described to assure compliance with regulations. Where the NRC Staff needed to confirm operational program implementation to reach a reasonable assurance finding, but the details of program implementation were not governed by specific regulatory requirements, the draft license contains conditions to ensure that operational programs will be properly implemented. This also supports the NRC Staff's conclusion that issuance of the COL will not be inimical to the common defense and security or to public health and safety.

**Q31. Did the NRC Staff review DEF's emergency plan?**

**A31.** Yes. The NRC Staff concluded that DEF's emergency preparedness and response plan is acceptable and supports the NRC Staff's conclusion that issuance of the COL will not be inimical to public health and safety.

**Q32. Did the NRC Staff make an overall inimicality finding?**

**A32.** Yes. Based on its review of the COL, the NRC Staff concluded that issuance of the LNP COL will not be inimical to the common defense and security or to public health and safety.

**10 C.F.R. § 52.97(a)(1)(vi)**

**Q33. Has the NRC Staff's review been adequate to support the findings set forth in 10 C.F.R. § 51.107(a)?**

**A33.** Yes, as discussed in the sections below, the NRC Staff's environmental review has been adequate to support the findings set forth in 10 C.F.R. § 51.107(a) for the purpose of issuing a COL for construction and operation of LNP Units 1 and 2.

**10 C.F.R. § 51.107(a)(1)**

**Q34. Have the requirements of Sections 102(2) (A), (C), and (E) of NEPA and the regulations in this subpart been met?**

**A34.** The NRC Staff evaluated the LNP COLA, including the Environmental Report, against applicable NRC regulations in 10 C.F.R. Parts 50, 51, 52, and 100 using applicable portions of the environmental SRP, issued in 2000 and updated in 2007, as well as ISGs, Reg. Guides, and generic letters.

**Q35. How did the NRC Staff prepare the LNP Unit 1 and 2 FEIS?**

**A35.** The NRC Staff prepared the FEIS based on its independent assessment of the information provided by DEF and information developed independently by the NRC Staff, including through consultation with other State and Federal agencies. The NRC Staff's findings in the FEIS reflect the "hard look" required by NEPA and have support in logic and fact.

**Q36. What was the scope of the FEIS?**

**A36.** As required by NEPA, the FEIS addresses (1) the environmental impact of the proposed action, (2) unavoidable adverse environmental effects, (3) alternatives to the proposed action, (4) the relationship between short-term users of the environment and the maintenance and enhancement of long-term productivity, and (5) irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented.

**Q37. You mentioned consultation with other agencies. Can you briefly describe those efforts?**

**A37.** The U.S. Army Corps of Engineers ("USACE") participated as a cooperating agency in preparing the FEIS and collaborated with the NRC Staff review team under a Memorandum of Agreement regarding the review of nuclear plant license applications signed by the NRC and USACE in 2008. The NRC also consulted with and received comments from other State and Federal agencies with jurisdiction by law or special expertise, such as the U.S. Fish and Wildlife Service and the U.S. Environmental Protection Agency. This correspondence is described in Appendix F of the FEIS.

**Q38. What types of alternatives did the NRC Staff consider in the FEIS?**

**A38.** The alternatives considered in the FEIS included the no-action alternative, energy alternatives, alternative sites, and system design alternatives. The FEIS demonstrates that the NRC Staff adequately considered alternatives to the proposed action, consistent with the requirements of NEPA.

**10 C.F.R. § 51.107(a)(2)**

**Q39. Has the NRC Staff independently considered the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken?**

**A39.** Yes. FEIS Section 10.6 contains the NRC Staff's summary of the cost-benefit balancing for the LNP COLA. The NRC Staff concluded that construction and operation of the proposed LNP Unit 1 and 2, with the mitigation measures identified by the NRC Staff, would have accrued benefits that most likely would outweigh the economic, environmental, and social costs associated with constructing and operating new units at the LNP Unit 1 and 2 site. The primary benefit from building and operating the LNP units is that they would generate baseload power and provide thousands of residential, commercial, and industrial consumers with electricity. The social and economic benefits of maintaining an adequate supply of electricity may be large, given that reliable electricity supplies are key to economic stability and growth. Other benefits include tax revenue, regional productivity, and community development. The benefits of building and operating LNP Units 1 and 2 are presented in FEIS Table 10-3. Internal costs to DEF, as well as external costs to the surrounding region and environment, would be incurred during the preconstruction, construction, and operation of the LNP Units. Internal costs include the costs to build the power plant (capital costs), as well as operating and maintenance costs, and the costs of fuel, waste disposal, and decommissioning. External costs include all costs imposed

on the environment and region surrounding the plant and may include the loss of regional productivity, environmental impacts, and loss of habitat. Internal and external costs of building and operating the LNP units are presented in FEIS Table 10-4.

**10 C.F.R. § 51.107(a)(3)**

**Q40. After weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, should the COL be issued?**

**A40.** Yes. In the FEIS, the NRC Staff considered the cost-benefit balancing and reasonable alternatives. Based on that assessment, the NRC Staff recommends that the COL be issued. The overall conclusion was based on (1) the ER; (2) consultation with Federal, State, Tribal and local agencies; (3) the NRC Staff review team's own independent evaluation; (4) the NRC Staff's consideration of public scoping comments on the environmental review; and (5) the assessments summarized in the FEIS, including mitigation measures. The NRC Staff also found that none of the alternative sites assessed in the FEIS is obviously superior to the LNP site. I concur with the NRC Staff's conclusions.

**Q41. How does the NRC Staff's conclusion relate to the findings that the USACE must make for activities within its jurisdiction?**

**A41.** The NRC's conclusion is independent of the USACE's determination of a Least Environmentally Damaging Practicable Alternative (LEDPA) under Section 404(b) of the Clean Water Act and the USACE's public interest review. The USACE's independent regulatory permit decision documentation addresses other information and evaluations that are outside the NRC's scope of analysis (and therefore not addressed in the FEIS), but are required by the USACE to support its permit decision. The USACE issued the Department of the Army 404

Permit for the LNP in December 2015 and their Record of Decision determined that the LNP site was the LEDPA.

**10 C.F.R. § 51.107(a)(3)**

**Q42. Has the NRC Staff's review been adequate?**

**A42.** Yes. The NRC Staff conducted an independent evaluation of the application that consumed more than three years of focused effort. The NRC obtained additional information as needed by DEF response to RAIs and site visits where appropriate. The NRC Staff developed independent, reliable information and conducted a systematic, interdisciplinary review of the potential impacts of the proposed action on the environment and reasonable alternatives to the proposed action. The NRC Staff considered the purpose of and need for the proposed action, the environment that could be affected by the action, and the consequences of the proposed action, including mitigation that could reduce impacts. The FEIS considered the potential impact of conservation measures in determining the demand for power and consequential need for additional generating capacity. The FEIS compared the alternatives to the proposed action. The NRC Staff considered the adverse environmental effects that could not be avoided should the proposed action be implemented, the relationship between short-term uses of the human environment and the maintenance and enhancement of long-term productivity, and the irreversible or irretrievable commitments of resources that would be involved in the proposed project.

**Q43. Was the public permitted to participate in the environmental review process?**

**A43.** Yes. At the start of the environmental review, the NRC Staff issued a notice of intent to prepare an FEIS and invited the public to provide any information relevant to the environmental



review (the NEPA scoping process). The NRC Staff also provided opportunities for governmental and general public participation during the public meeting on the draft Environmental Impact Statement (“DEIS”) and sought, received, and responded to comments on the DEIS from the public. Those responses are documented in the FEIS. The NRC also considered environmental contentions in the public hearing process conducted under the Atomic Energy Act.

**Q44. What are your overall conclusions regarding the NRC Staff’s Environmental Review?**

**A44.** I agree with the NRC Staff that, for the purpose of issuing the LNP COL, the NRC Staff conducted a thorough and complete environmental review that was sufficient to meet the requirements of NEPA and adequate to inform the Commission’s action on the COL request.

**IV. CONCLUSION**

**Q45. What are your overall safety conclusions regarding issuance of the COL?**

**A45.** With respect to safety issues, the application and the record of the licensing review contain sufficient information, and the review of the application by the NRC Staff has been adequate, to support the findings to be made by the Commission, with respect to the standards set forth in the Hearing Notice and the applicable standards in NRC regulations. Based on the record, DEF is technically and financially qualified to construct and operate LNP Units 1 and 2. Issuance of a permit for the construction and operation of LNP Units 1 and 2 will not be inimical to the common defense and security or to the health and safety of the public.

**Q46. What are your overall environmental conclusions regarding the issuance of the COL?**

**A46.** Based upon the entire record of this proceeding, the environmental review conducted by the NRC Staff pursuant to 10 C.F.R. Part 51 has been adequate; the requirements of Sections 102(2)(A), (C), and (E) of NEPA have been satisfied; an independent weighing and balancing of the environmental, technical, and other costs and benefits of the LNP Units 1 and 2 supports the issuance of the license; and the requested license should be issued.

### **Certification**

I, Robert H. Kitchen, certify that the testimony above was prepared by me or under my direction, and I adopt this testimony as my sworn testimony in this proceeding. I hereby certify under penalty of perjury that the testimony above is true and correct to the best of my knowledge, information, and belief.

/Executed in Accord with 10 C.F.R. § 2.304(d)/

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Dated at Charlotte, NC,  
this 20th day of July, 2016

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION**

Before the Commission

In the Matter of	)	
	)	
Duke Energy Florida, LLC	)	Docket Nos. 52-029 and 52-030
	)	
(Levy Nuclear Plant, Units 1 and 2)	)	

**CERTIFICATE OF SERVICE**

I hereby certify that the foregoing Duke Energy Florida's Corrected Pre-Filed Testimony in Support of the Mandatory Hearing for the Levy Nuclear Plant, Units 1 and 2, Combined Licenses, and accompanying Certification, have been refiled as an exhibit and served through the E-Filing system on the participants in the above-captioned proceeding, this 20th day of July, 2016.

/Signed electronically by David R. Lewis/

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David R. Lewis