APPENDIX F

REPORT BY THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

September 16, 2016

The Honorable Stephen G. Burns
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: REPORT ON THE SAFETY ASPECTS OF THE FLORIDA POWER & LIGHT COMPANY'S COMBINED LICENSE APPLICATION FOR TURKEY POINT UNITS 6 AND 7

Dear Chairman Burns,

During the 636th meeting of the Advisory Committee on Reactor Safeguards (ACRS), September 8-10, 2016, we reviewed the Florida Power & Light Company (FPL or applicant) combined license application (COLA) for Turkey Point Units 6 and 7 and the NRC staff's advanced safety evaluation (ASE). FPL proposes to construct and operate two Westinghouse AP1000 reactors at their owned and controlled 9400-acre Turkey Point plant property, located in Miami-Dade County, Florida, approximately 25 miles south of Miami. Currently, the Turkey Point plant property includes five operating electric generating units: two oil/gas-fired units (Units 1 and 2), one gas-fired combined cycle unit (Unit 5), and two nuclear power units (Units 3 and 4). Both Units 3 and 4 are Westinghouse-designed pressurized water reactors. They entered commercial operation in 1972 and 1973, respectively.

Our AP1000 Subcommittee held a two-day meeting on August 18-19, 2016, to review the plant-specific information in the COLA and the staff's ASE. During this review, we had the benefit of discussions with representatives of the staff, FPL and its vendors, and input from members of the public. We also had the benefit of the referenced documents. This report fulfills the requirement of 10 CFR 52.87 that the ACRS report on those portions of the application which concern safety.

CONCLUSIONS AND RECOMMENDATION

1. There is reasonable assurance that Turkey Point Units 6 and 7 can be built and operated without undue risk to the health and safety of the public. The FPL COLA for these units should be approved.

2. The following proposed site-specific departures from the AP1000 design control document (DCD) should be approved.

    a. Consolidation of the Technical Support Center (TSC) to provide support to Turkey Point Units 3, 4, 6, and 7.

   b. Meteorological exceedances for the operating basis wind speed and for the maximum safety and maximum normal wet bulb air temperatures.

   c. Exclusion area boundary minimum distance.

3. Staff should consider if existing guidance for estimating future sea level rise and guidance for location of the TSC should be updated to reflect changing circumstances.

BACKGROUND

By letter, dated June 30, 2009, FPL submitted a COLA to the NRC for Turkey Point Units 6 and 7, in accordance with the requirements of 10 CFR Part 52. In the application, FPL stated that these units would be two Westinghouse AP1000 advanced pressurized water reactors and they would be located at the existing Turkey Point site. The COLA incorporates the Westinghouse AP1000 certified design, the standard content material from the AP1000 reference combined license application (RCOLA), and the FPL site-specific information.

The design centered review approach is described in Regulatory Issue Summary 2006-06. The design centered review approach is Commission policy intended to promote standardization of COLAs beyond the scope of information included in the design certification. Specifically, this policy allows the staff to perform one technical review for each issue outside the scope of the design certification and it allows the decision based on this review to support multiple COLAs.

The first COLA submitted for NRC staff review is designated in a design center as the RCOLA, and the subsequent applications which reference the RCOLA are designated as subsequent combined license applications (SCOLAs). The Turkey Point Units 6 and 7 COLA is the fourth SCOLA referencing the AP1000 DCD and Vogtle RCOLA. It includes the same five AP1000 departure requests we first reviewed under the Levy docket and addressed in our letter report to the Commission, dated April18, 2016.

FPL has organized and annotated its SCOLA to identify: a) sections that incorporate by reference the AP1000 DCD, b) sections that are standard for COLAs in the AP1000 RCOLA, and c) sections that are site-specific and thus only apply to Turkey Point Units 6 and 7.

DISCUSSION

<u>Population Density</u>

Regulatory Guide 4.7 includes a criterion for satisfying 10 CFR 100.21, relative to siting in an area of low population density. The guidance also includes provisions for determining site acceptability when the criterion is exceeded, provided that population density is not well in excess of the criterion. The low population density criterion is that within about five years of plant site approval, the population density, including weighted transient population, averaged over any radial distance out to 20 miles (cumulative population at a distance divided by the circular area at that distance), does not exceed 500 persons per square mile. Based on FPL's projection, this criterion is exceeded from 5 to 20 miles by about one-third.

Accordingly, FPL implemented the guidance provisions for determining site acceptability. This requires consideration of alternative sites with lower nearby population densities, while giving attention to safety, environmental, economic, and other factors. FPL found that the Turkey Point site offered advantages related to grid reliability, land availability, and existing nuclear plant and emergency planning infrastructure. Staff review concluded that regulatory guidance concerning population density had been met.

FPL stated that the exceedance of 500 persons per square mile by one-third was not considered to be well in excess of the low population density criterion, and it noted that Turkey Point meets all regulatory requirements and guidance for the exclusion area, low population zone, distance to the nearest population center, and for emergency planning. We agree that the exceedance of the 500 persons per square mile guidance is acceptable, particularly given that all other population-related siting requirements and guidance are met, and that consideration was given to alternative siting in accordance with 10 CFR 100.21(h).

Sea Level Rise

Regulatory Guide 1.59 includes guidance for establishing the plant flooding design basis. For coastal sites, this requires determination of the sea level before any rise resulting from an event such as a hurricane or tsunami. NUREG/CR-7046 recommends a method for estimating the long-term rise in sea level, using applicable gage station data. Following this guidance, and extrapolating for an assumed plant life of 60 years, FPL established an event antecedent sea level one foot above the current level. This higher sea level then became the basis for additions due to tide, local sea anomalies, and external events applicable to the site.

As discussed in Section 2.4.5.4.4 of its ASE, the staff referred to the possibility of an accelerating rise in sea level during the plant life which might not be shown in the historical data. FPL noted that they had followed the applicable guidance and recommendations, and that margins existed not only in the one foot sea level rise they had established based on historical data, but also in the additions to this element of antecedent level such as the tide level assumed.

The rise in sea level over time is monitored and widely publicized, so that the potential for an accelerating rise resulting in an increase above the one foot allowance used by FPL can be recognized well before it occurs. If necessary due to accelerating rates of sea level rise, measures could be taken at the time they are apparent to ensure that the safety design basis of the plant is maintained. We expect that the Turkey Point Units 6 and 7 licensing basis will be explicit concerning the assumed sea level rise of one foot, and that the licensee will remain aware of recorded sea level rise so as to recognize the potential exceedance during the plant life.

Regarding forecasts of potential sea level rise acceleration, including those made by government agencies, the staff should review regulatory guidance generically to determine if such forecasts should be addressed in establishing an antecedent sea level for siting purposes, or whether continued reliance on extrapolation of historical data remains sufficient.

Flooding Evaluations

The coastal location of the site requires the determination of probable maximum flooding levels to consider hurricane storm surge with wave run up, tsunami, and local precipitation events. FPL determined the highest water elevation in the power block area due to a probable maximum local precipitation event to be 24.5 feet, and due to a probable maximum hurricane, with storm surge, to be 24.8 feet. The U.S. Army Corps of Engineers performed an independent study of the site for a storm with an annual frequency of 1×10^{-7} which yielded a result within 0.1 feet of this level.

On August 16, 1992, Hurricane Andrew caused severe flooding in the State of Florida. During Hurricane Andrew, rainfall totals of more than seven inches were recorded in southeastern Florida and the peak storm surge on the southeast Florida coast occurred near the time of high astronomical tide. FPL stated that the highest storm level in Biscayne Bay of 15.4 feet was observed during Hurricane Andrew approximately 10 miles from the site. FPL stated that the level was lower than this at the Turkey Point site.

FPL considered the historical record, geological evidence, and physical data to evaluate the probable maximum tsunami elevation at the site. The staff also performed an independent tsunami modeling assessment resulting in a surface water elevation of 14.1 feet, which is in good agreement with the applicant's value of 14.0 feet.

The plant design grade level for safety-related structures is 26 feet, which is above the highest water levels calculated for the potential events that could affect the site, and therefore is considered acceptable.

Deep Well Injection

FPL proposes to dispose of Turkey Point Units 6 and 7 liquid radioactive waste by first combining it with other sources of plant liquid waste to achieve the dilution required for release in compliance with 10 CFR Part 20, Appendix B. The combined waste stream is then pumped into a saline underground aquifer using deep well injection, which is an established means widely used in the region for disposal of other forms of liquid waste. Disposal of liquid radioactive waste by discharge to an underground aquifer is an alternative to its release into surface waters. Accordingly, approval of the disposal procedure is required in accordance with 10 CFR 20.2002.

The deep well injection is into the saline aquifer more than 3,000 feet below the ground surface. This aquifer is separated from a brackish aquifer above by intermediate confining strata. The injection system design includes monthly sampling of separate monitoring wells to detect any leakage from the injection wells at depths above the saline aquifer.

Although the discharged waste is expected to remain in the saline aquifer, FPL analyzed the consequences of saline aquifer intrusion by the drilling of a well into the aquifer to withdraw water for agricultural use. Independently, the staff analyzed a scenario involving the full breach

of the confining strata above the saline aquifer, allowing waste to enter the higher zone at the nearest offsite location where a well is assumed to be withdrawing water. Both analyses used conservative assumptions relative to radioactive decay and further dilution of the radioactive waste, and relative to the resulting dose to the maximally exposed individual. The results comply with 10 CFR Part 50, Appendix I, and confirm that doses are below the design objectives.

In summary, the liquid radioactive waste release complies with requirements applicable to discharge to surface waters, although it will be discharged instead into an underground aquifer where it is expected to remain. If it were not to remain in the aquifer, either due to intrusion or to confinement failure, the consequences would remain below requirements applicable to a surface discharge. The applicant complied with the requirements of 10 CFR 20.2002 for seeking approval of this alternate method of radioactive waste disposal.

Consolidated Technical Support Center and Emergency Operations Facility

An emergency response facility departure from the AP1000 DCD provides for a common TSC for Units 3, 4, 6, and 7. The TSC is located in the Turkey Point Nuclear Training Building, which is outside of the protected areas between the control rooms for Units 3 and 4 and the control rooms for Units 6 and 7. This is estimated to increase the travel time between the TSC and the control room from two minutes for the single-unit TSC location for the AP1000 design to about 10 to 15 minutes for the common TSC location. This increase is considered acceptable based on the communications and data links that are provided and on the expected benefits of maintaining a single TSC.

Guidance concerning location of the TSC is included in NUREG-0696. Among other things, the guidance suggests a walking time from the TSC to the control room of two minutes. The standard review plan allows improvement in communication technology to increase this walking time significantly, as has been reflected in several licensing actions recently. The benefits of a consolidated TSC at a multi-unit site, using current communication technology appear to warrant updating NUREG-0696, and we recommend that the staff consider doing so.

The applicant is also seeking approval for the emergency operations facility (EOF) to be located in Miami, Florida, approximately 26 miles from the site, in an existing FPL General Office building which is currently supporting Turkey Point Units 3 and 4. The staff has proposed several inspections, tests, analyses, and acceptance criteria (ITAAC) to demonstrate the ability of the EOF to support an emergency condition at the Turkey Point site. Demonstration of compliance with these ITAAC will be completed prior to fuel loading. The distance from the Turkey Point site to the common EOF is not excessive.

Meteorological Departures

FPL determined that meteorological conditions at the site exceed those included in the AP1000 DCD for three parameters. The 50-year return period, 3-second gust at Turkey Point is 150 mph, which exceeds the DCD value of 145 mph. The maximum safety and normal wet bulb temperatures of approximately 87.4°F and 81.5°F, respectively, exceed the DCD values of 86.1°F and 80.1°F. These relatively small, site-specific meteorological exceedances were evaluated by FPL and the staff and found not to affect design functions or analysis methods of any structures, systems or components.

Exclusion Area Boundary Distance Departure

The AP1000 DCD requires a distance from the plant to the exclusion area boundary of 0.5 miles. The minimum distance for Turkey Point Units 6 and 7 is 0.27 miles, and this shorter distance has been reflected in the calculation of accident doses at the boundary. As discussed in Section 2.3.4.6 of the ASE, using atmospheric dispersion parameters appropriate to the shorter distance, the results are found to be acceptable.

SUMMARY

The applicant and the staff have addressed the plant-specific requirements necessary for approval of the SCOLA. This includes DCD departures concerning the site-specific meteorology, exclusion area boundary minimum distance and the location of the TSC. The SCOLA for Turkey Point Units 6 and 7 should be approved.

Sincerely,

/RA/

Dennis C. Bley
Chairman

REFERENCES

1. Florida Power & Light Company, "Application for Combined License for Turkey Point Units 6 and 7," June 30, 2009 (ML091830589).

2. U.S. Nuclear Regulatory Commission, Regulatory Issue Summary 2006-06, "New Reactor Standardization Needed to Support the Design-Centered Licensing Review Approach," May 31, 2006 (ML053540251).

3. Advisory Committee on Reactor Safeguards, "Exemptions to the AP1000 Certified Design Included in the Levy Nuclear Plant Units 1 and 2 Combined License Application," April 18, 2016 (ML16102A149).

4. U.S. Nuclear Regulatory Commission, Regulatory Guide 4.7, "General Site Suitability Criteria for Nuclear Power Stations," Revision 2, April 1998 (ML003739894).

5. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.59, "Design Basis Floods for Nuclear Power Plants," Revision 2, August, 1977 (ML003740388).

6. U.S. Nuclear Regulatory Commission, NUREG/CR-7046, "Design-Basis Flood Estimation for Site Characterization at Nuclear Power Plants in the United States of America," November 2011 (ML11321A195).

7. U.S. Nuclear Regulatory Commission, NUREG-0696, "Functional Criteria for Emergency Response Facilities," February 1981 (ML051390358).

8. U.S. Nuclear Regulatory Commission, "Turkey Point Units 6 and 7 Combined License Application – Advanced Safety Evaluation without Open Items for Chapter 1 through 21"

ASE Chapter	Issuance Date	ML#s
1	7-14-2016	ML14349A710
2	7-14-2016	ML15096A254
3	7-12-2016	ML15096A264
4	7-12-2016	ML12202A833
5	7-12-2016	ML16159A198
6	7-12-2016	ML16117A527
7	7-12-2016	ML16159A234
8	7-12-2016	ML15096A344
9	7-12-2016	ML15096A428
10	7-12-2016	ML12262A056
11	5-17-2016	ML15096A457
12	7-12-2016	ML16161A380
13	7-12-2016	ML16061A443
14	7-12-2016	ML16161A384
15	7-12-2016	ML16166A272
16	7-12-2016	ML16161A359
17	7-12-2016	ML12262A238
18	7-12-2016	ML12262A247
19	7-14-2016	ML12262A277
19.A	7-14-2016	ML12262A286
20	5-17-2016	ML16062A258
21	7-14-2016	ML16137A481

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

April 18, 2016

The Honorable Stephen G. Burns
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: EXEMPTIONS TO THE AP1000 CERTIFIED DESIGN INCLUDED IN THE LEVY NUCLEAR PLANT UNITS 1 AND 2 COMBINED LICENSE APPLICATION

Dear Chairman Burns,

During the 633rd meeting of the Advisory Committee on Reactor Safeguards (ACRS), April 7-9, 2016, we reviewed five exemption requests for the Westinghouse Electric Company (WEC) AP1000 certified design which Duke Energy Florida, LLC (Duke Energy) has included in the combined license application (COLA) for the Levy Nuclear Plant (Levy) Units 1 and 2. We also reviewed the NRC staff's related Advanced Safety Evaluation Report (ASER), Chapter 21. The exemptions include changes that are grouped into six departures from the AP1000 Design Control Document (DCD), Revision 19. Our AP1000 Subcommittee held a meeting on April 5, 2016, to review the departures and the staff's ASER. The Subcommittee also met with Duke Energy, WEC, and the staff on April 9 and September 17, 2014, to review the development of the changes that are needed to achieve the intended design functions for passive residual heat removal (PRHR). These changes are included in the exemption concerning condensate return and PRHR.

During the meeting, we had the benefit of discussions with representatives of the staff, Duke Energy, and WEC, and we had input from members of the public. We also had the benefit of the referenced documents. This report fulfills the requirement of 10 CFR 52.87 that the ACRS report on those portions of the application which concern safety.

CONCLUSIONS AND RECOMMENDATION

1. Five exemptions to the AP1000 certified design have been included in the Levy combined license application. The five exemptions are needed to enable the certified design to perform intended functions and should be approved.

2. The causes for the exemptions have been identified and addressed for the AP1000 certification.

3. Generic lessons learned, relative to the reactor design process leading to certification, should be identified and further evaluated.

BACKGROUND

By letter dated July 28, 2008, Progress Energy Florida, Inc., now Duke Energy, submitted a COLA for Levy Units 1 and 2 to the NRC. On December 7, 2011, we issued a letter report to the Commission recommending approval following implementation of the stated recommendations. Subsequently, changes needed to achieve the intended design functions for PRHR were identified. Development of these changes was undertaken by WEC, with oversight from Duke Energy, and these changes are now required to be included in the COLA, pursuant to Interim Staff Guidance DC/COL-ISG-011. These departures are common to all COLAs referencing the AP1000 design, and similar changes will be necessary for AP1000 combined license holders.

Ongoing detailed design of the AP1000 units, and investigation into the extent of the condition that created the need for the PRHR-related changes, identified other needed changes requiring approval of exemptions in four additional areas. Duke Energy noted the areas requiring departures from the certified AP1000 design during our review of its William States Lee III Nuclear Station (Lee) Units 1 and 2 COLA in 2015. These were listed as follows in our letter, dated December 14, 2015, concerning the Lee COLA:

- Condensate return and PRHR
- Main control room operator dose
- Main control room heat load
- Plant monitoring system flux doubling to comply with IEEE 603
- Hydrogen vent in containment

DISCUSSION

The five exemptions and associated departures from the AP1000 certified design are needed to implement intended functions of the certified design. Each is distinct and separate from the others. The changes will be made for the common purpose of correcting errors and omissions in the certified design, which have been identified during licensing and detailed design development subsequent to certification. Therefore, we also reviewed elements that are common to the departures; in particular, the implementation of the quality assurance program requirements in 10 CFR Part 50, Appendix B during design. Finally, we also reviewed the staff's assessment of the effect of the departures on the previously completed probabilistic risk assessment.

Condensate Return and Passive Residual Heat Removal

The AP1000 design provides for closed-loop cooldown and passive heat removal under accident conditions not involving loss of coolant. Reactor coolant circulates naturally through a PRHR heat exchanger located within the in-containment refueling water storage tank (IRWST). The PRHR heat exchanger converts IRWST water to steam, and the subsequent condensation of this steam on the containment vessel interior surface passively transfers residual heat by conduction through the containment wall to the outside air. This closed-loop cooling requires that sufficient condensed water be returned to the IRWST to ensure the inventory needed to maintain the cooldown status and to continue the PRHR process for as long as necessary.

Features in the containment that are required to direct condensate back to the IRWST are described in AP1000 DCD, Revision 19. The rate of condensation varies with time, and the return of condensate to the IRWST is subject to some loss. A constant loss rate of 10 percent was assumed in the DCD analysis. Based on this assumption, DCD, Revision 19 states that (a) acceptance criteria associated with the Chapter 15 design basis safety analyses remain satisfied indefinitely, and (b) cooldown to 420°F can be achieved in 36 hours and maintained indefinitely, based on Chapter 19 assumptions and acceptance criteria.

Duke Energy has proposed for its Levy COLA an exemption seeking approval of two departures that concern cases (a) and (b) above. These departures involve physical changes in containment to increase condensate return. Downspouts, collection points, and connecting piping have been added to the polar crane girder and the internal stiffener, and many attachment plates on the containment inner surface have been eliminated. Additional testing was performed to estimate better the condensate collection on surfaces and losses at discontinuities such as attachment plates and to provide an improved basis for the estimation of condensate losses.

Based on testing and the additional features provided to return sufficient condensate back to the IRWST, a loss rate of 18 percent of the water that condenses on the containment vessel inner surface has now been assumed for cases (a) and (b) above. Water that condenses on other surfaces within containment is assumed to be entirely lost to the IRWST.

Analyses by WEC and the staff of PRHR performance were extensive. WEC used WGOTHIC and LOFTRAN with some confirmatory analyses using RELAP. Adiabatic and heat-loss models of the reactor coolant system, and the potential loss of subcooling in the reactor coolant system on heat transfer in the PRHR heat exchanger, were examined. The staff's confirmatory calculations used MELCOR and RELAP, and their results agreed well with the WEC calculations. The analyses included both the most limiting Chapter 15 non-loss-of-coolant-accident transient that credits the PRHR heat exchanger, which is the loss of normal feedwater coincident with the loss of AC power to the plant auxiliaries, and the safe shutdown analysis in Chapter 19. Based on these analyses, the duration for case (a) was extended to 72 hours, and the duration for case (b) was revised from an indefinite period to at least 14 days. Also, criteria for activation of the backup automatic depressurization system in order to establish open loop PRHR were updated.

Main Control Room Operator Dose

WEC identified several discrepancies in the certified design analyses supporting the determination of main control room (MCR) operator dose following a design basis accident (DBA). Specifically, (1) the analyses did not account for the direct dose from the MCR emergency ventilation system filter, (2) the normal ventilation system radiation monitor setpoints were not based upon all DBA release scenarios, and (3) the methodology used to estimate MCR dose contribution from direct radiation and skyshine was not up-to-date.

This exemption includes changes which add shielding for the ventilation filter, reduce the allowable secondary coolant iodine activity, update the radiation dose analyses, and revise the normal ventilation system radiation monitor logic and setpoints. The result of the changes provides a revised MCR dose for the DBA, which slightly increases the margin to the 5 rem limit.

Main Control Room Heat Load

Duke Energy identified that heat sources in the MCR had increased with detailed design development and now exceed those assumed in the certified design. Also, the design had not considered an event in which the MCR could be isolated and dependent on the emergency ventilation system, while offsite power remained available and powering certain MCR equipment. This event results in significantly higher heat loads than are considered in the certified design.

The exemption includes changes that add automatic, two-stage de-energization of select non-safety MCR heat loads. This load shed retains power for plant controls and parameter indications at the operators' normal work stations. Also, changes were made to establish limits, with surveillance requirements, for the initial MCR conditions and to ensure operation of the electrical load shedding functions.

With these changes, analysis projects that operators may remain in the MCR indefinitely, consistent with NUREG-0700 limits, following its isolation and resulting dependence on the emergency ventilation system.

Plant Monitoring System Compliance with IEEE 603

The source range neutron flux logic is a control system feature of the plant monitoring system that isolates dilute water sources to the reactor coolant system, in order to protect against inadvertent criticality due to boron dilution during shutdown conditions. Under some plant conditions, it is necessary to manually block or bypass the operation of this feature.

Operating bypasses are addressed in IEEE Standard 603-1991, and this standard is applicable to COLAs referencing the AP1000 certified design. WEC identified that, due to an omission, the certified design did not meet the requirements of the standard because this protection function could be blocked and would not be reset automatically when plant conditions require it. The exemption includes a change that will revise the plant monitoring system logic to comply with the standard and with regulatory requirements.

Hydrogen Vent Inspection, Tests, Analyses, and Acceptance Criteria (ITAAC)

WEC identified that changes in structural details internal to the containment have occurred which are inconsistent with the certified design ITAAC for one of the compartments, relative to the venting of any hydrogen accumulation in the compartment following a severe accident. The

departure change to the ITAAC recognizes the possibility of a standing hydrogen flame that is closer to the containment boundary than allowed by the current ITAAC. Although the possible standing flame is closer to the containment boundary, results from analyses indicate that the higher temperatures would not compromise the structural integrity of the containment wall or of the equipment hatch cover and seals, and therefore, is acceptable.

NRC Staff Review

On March 7, 2016, the ASER for the five exemptions included in the Levy COLA was transmitted to the ACRS for review. It documents the staff's very thorough and technically complete review of the changes as they were developed over the past three years. The staff has identified that each of the exemptions is necessary in order to perform the intended functions, and therefore, meet the underlying purposes of the AP1000 certification rule.

The concluding statement in ASER Section 21.0 is "The staff finds that the cumulative risk impact of these design changes and departures is negligible." The changes are necessary to perform the intended functions that were the basis for the DCD risk calculation. However, the risk has not been calculated for the condition without the changes. While it is clear that there has been no increase in risk, it should not be concluded that the actual reduction in risk achieved by these changes is negligible.

Design Certification Quality Assurance Program

Detailed development of a certified design, involving the increasing engagement of combined license holders and applicants, should be expected to identify needed design and analysis changes. However, there are lessons to be learned from the Levy COLA experience.

Following initial discussions with our Subcommittee in 2014, WEC, Duke Energy, and the staff performed thorough evaluations, including the quality assurance program implementation. The results were reflected in the April 2016 Committee presentations. We conclude that the causes of the errors and omissions that made these exemptions necessary were addressed and programmatic changes applicable to the AP1000 certification were made where necessary.

We recommend that staff evaluate on a generic basis whether there are any lessons learned, relative to ongoing and future oversight of the quality assurance program implementation during development of designs seeking certification under 10 CFR Part 52. Prospective combined license applicants may not be in a position to provide such oversight during this phase, and they may find it difficult to do so following certification when customer oversight can be more effective. We would appreciate the opportunity to meet with the staff on this generic matter at an appropriate time.

Conclusion

The five exemptions, which include six departures from the AP1000 certified design that will be included in the Levy Units 1 and 2 COLA, effectively address errors and omissions in the current certification and should be approved. As indicated in our letter on the Lee Units 1 and 2 COLA, dated December 14, 2015, other combined license applicants referencing the AP1000 certified design will also include the exemptions in accordance with the design centered review approach described in that letter. Current combined license holders will submit license amendments to incorporate these, or similar, changes.

Sincerely,

/RA/

Dennis C. Bley
Chairman

REFERENCES

1. Duke Energy Florida, Levy Nuclear Plant, Units 1 and 2, “Supplemental Response to NRC RAI Letter 124 - SRP Section 6.3 to Address Containment Condensate Return Cooling Design,” January 14, 2016 (ML16020A105).

2. Duke Energy Florida, Levy Nuclear Plant, Units 1 and 2, “Revised Partial Response to Request for Additional Information Letter No. 121 Related to SRP Section 6.2.5, Combustible Gas Control in Containment,” January 6, 2016 (ML16008A082).

3. Duke Energy Florida, Levy Nuclear Plant, Units 1 and 2, “Departure from AP1000 DCD Revision 19 to Address Compliance with IEEE 603-1991,” September 1, 2015 (ML15247A153).

4. Duke Energy Florida, Levy Nuclear Plant, Units 1 and 2, “Revised Response to Request for Additional Information Letter No. 121 Related to SRP Section 6.2.5 and 6.4 for the Levy Nuclear Plant, Units 1 and 2 Combined License Application,” July 1, 2015 (ML15189A255).

5. Duke Energy Florida, Levy Nuclear Plant, Units 1 and 2, “Response to Request for Additional Information Letter No. 122 Related to SRP Section 6.4, Control Room Habitability,” March 26, 2015 (ML15089A193).

6. U.S. Nuclear Regulatory Commission, “Levy, Units 1 and 2 – Chapter 21, ‘Design Changes Proposed in Accordance with ISG-11’,” March 7, 2016 (ML16026A016).

7. Progress Energy, “Application for Combined License for Levy Nuclear Power Plant Units 1 and 2,” July 28, 2008 (ML082260277).

8. Advisory Committee on Reactor Safeguards, “Report on the Safety Aspects of the Progress Energy Florida, INC. Combined License Application for Levy Nuclear Plant, Units 1 and 2,” December 7, 2011 (ML11339A126).

9. U.S. Nuclear Regulatory Commission, Interim Staff Guidance DC/COL-ISG-011, “Finalizing Licensing Basis Information,” November 2, 2009 (ML092890623).

10. Advisory Committee on Reactor Safeguards, “Report on the Safety Aspects of the Duke Energy Carolinas, LLC, Combined License Application for William States Lee III Nuclear Station, Units 1 and 2,” December 14, 2015 (ML15348A196).

11. Westinghouse Electric Company, “Westinghouse AP1000 Design Control Document Revision 19,” June 13, 2011 (ML11171A500).

12. IEEE Standard 603-1991, “IEEE Standard Criteria for Safety Systems for Nuclear Power Stations,” June 27, 1991.