



CHRISTOPHER M. FALLON  
Vice President  
Nuclear Development

Duke Energy  
EC12L/526 South Church Street  
Charlotte, NC 28202

Mailing Address:  
EC12L / P.O. Box 1006  
Charlotte, NC 28201-1006

Serial: NPD-NRC-2015-057  
December 22, 2015

10 CFR 52.79

o: 704.382.9248  
c: 704.519.6173  
f: 980.373.2551

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D.C. 20555-0001

christopher.fallon@duke-energy.com

**LEVY NUCLEAR PLANT, UNITS 1 AND 2 DOCKET NOS. 52-029 AND 52-030  
REVISED RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 132  
RELATED TO STANDARD REVIEW PLAN SECTION 9.4.1, CONTROL ROOM AREA  
VENTILATION SYSTEM, FOR THE LEVY NUCLEAR PLANT, UNITS 1 AND 2, COMBINED  
LICENSE APPLICATION**

- Reference:
- 1) Letter from Donald Habib (NRC) to Christopher M. Fallon (DEF), dated September 14, 2015, "Request For Additional Information Letter No. 132 Related To Standard Review Plan Section 9.4.1, Control Room Area Ventilation System, For The Levy Nuclear Plant, Units 1 And 2, Combined License Application" (ML15257A186).
  - 2) Letter from Christopher Fallon (DEF) to Nuclear Regulatory Commission (NRC), dated October 14, 2015, "Response to Request for Additional Information Letter No. 132 Related to SRP Section 9.4.1, Control Room Area Ventilation System, for the Levy Nuclear Plant, Units 1 and 2, Combined License Application", Serial: NPD-NRC-2015-044 (ML15289A237).

Ladies and Gentlemen:

Duke Energy Florida, LLC (DEF) hereby submits our revised response to the Nuclear Regulatory Commission's (NRC) request for additional information provided in Reference 1. The revised Levy response to RAI 132 is addressed in Enclosure 1 to this letter. Attachment A to Enclosure 1 contains the non-proprietary version of the response and Attachment B to Enclosure 1 contains the proprietary version of the response.

This response includes proposed changes to the Technical Specifications and Final Safety Analysis Report. The changes are shown in Enclosure 1. These changes will be included in a future update of the LNP COLA.

Also enclosed is the Westinghouse Application for Withholding Proprietary Information from Public Disclosure CAW-15-4325, accompanying Affidavit, Proprietary Information Notice, and Copyright Notice. (Enclosures 2 and 3).

As Attachment B to Enclosure 1 contains information proprietary to Westinghouse Electric Company LLC, it is supported by an Affidavit signed by Westinghouse, the owner of the information. The Affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in

DO94  
NRC

paragraph (b)(4) of Section 2.390 of the Commission's regulations. Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse Affidavit should reference CAW-15-4325 and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 3 Suite 310, Cranberry Township, Pennsylvania 16066.

If you have any further questions, or need additional information, please contact Bob Kitchen at (704) 382-4046, or me at (704) 382-9248.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 22, 2015.

Sincerely,



Christopher M. Fallon  
Vice President  
Nuclear Development

Enclosures/Attachments:

1. LNP Revised Response to NRC RAI Letter No. 132
  - A. Revised Response to NRC RAI 132 (Non-Proprietary)
  - B. Revised Response to NRC 132 (Proprietary)
2. Westinghouse Application Letter CAW-15-4325 and Affidavit
3. Proprietary Information Notice and Copyright Notice

cc (w/o enclosures): U.S. NRC Region II, Regional Administrator  
cc (w/ enclosures): Mr. Donald Habib, U.S. NRC Project Manager

**Levy Nuclear Plant Units 1 and 2 (LNP)  
Revised Response to NRC Request For Additional Information Letter No. 132 Related To  
Standard Review Plan Section 9.4.1, Control Room Area Ventilation System, dated  
September 14, 2015**

<u>NRC RAI #</u>	<u>Duke Energy RAI #</u>	<u>Duke Energy Response</u>
09.04.01-1	L-1170	Revised response enclosed – see following pages

**NRC Letter No.: LNP-RAI-LTR-132**

**NRC Letter Date: September 14, 2015**

**NRC Review of Final Safety Analysis Report**

**NRC RAI NUMBER: 09.04.01-1**

**Text of NRC RAI:**

09.04.01-1

The design basis for the AP1000 main control room emergency habitability system (VES) is to provide emergency ventilation and pressurization for the main control room. The AP1000 VES air storage tanks, which contain high pressure breathable air, are sized to deliver the required air flow to the main control room and induce sufficient air flow through the passive filtration line to meet the ventilation and pressurization requirements for 72 hours based on the performance requirements specified in the AP1000 DCD, Tier 2, Chapter 6.

VES compressed air quality is specified in the AP1000 DCD, Tier 2, Chapter 9 as Quality Verification Level E air as defined in ANSI/CGA G-7.1. Level E does not specify a limiting characteristic for the moisture content in the air. Although the applicant states that the air will be supplied from instrument air, which is dry, there are no provisions to this effect in the DCD. Therefore, the potential exists for the air in the VES bottles to vary in moisture content.

Levy incorporates by reference the AP1000 DCD related to VES. Levy submitted a departure and exemption request dated March 26, 2015, to address issues related to main control room heat up. Analysis[1] performed by the applicant associated with the departure and exemption request assumes a very low moisture content for VES air in order to demonstrate compliance with requirements related to the control room habitability. No assessment was provided assuming a high moisture content. A high moisture content in VES air would appear to be conservative when assessing bounding high control room humidity levels. In contrast, assuming a very low moisture limit is potentially non-conservative with respect to bounding high humidity levels based on the air quality specified in the DCD, i.e., the DCD does not specify a VES moisture content nor does it indicate that VES moisture is important to achieving emergency habitability for the main control room, as an input to the effective temperature of the control room for the first 72 hours.

In addition, the expansion of air tends to result in a decrease in temperature related to the reduction in pressure. Air expanding from high pressure (under the conditions projected to occur at the pressure regulator in the VES system) may cool down by as much as 90 degrees F due to the Joule-Thomson effect. If there is sufficient moisture present in the air (relatively high pressure-dew-point) the moisture in the air may freeze as the air cools down below the freezing point during gas expansion. The ice (freezing moisture) that forms may block the VES flow paths at restrictions such as valves, pressure regulators, or orifices. Levy analysis[2] associated with the departure and exemption request predicts potentially below freezing temperatures during VES operation. The AP1000 DCD Tier 2, Chapter 6 also specifies that there is no source that could create line blockage in the VES line from the air bottles to the eductor.

The staff requests that Levy assess the VES air quality requirements related to moisture in the air. If the supporting safety analyses require a VES moisture content that is more restrictive than the specification provided in the referenced AP1000 design basis, then include this requirement in the Levy licensing basis, including consideration of Technical Specification

surveillances for air quality testing, and specify the basis for the limit (e.g., assessing humidity in the control room, preventing line blockage, or other).

- 
- [1] APP-VES-M3C-107
  - [2] APP-VES-M8-001

**DEF RAI ID#: L-1170**

**DEF Revised Response to NRC RAI:**

See Attachment A for the non-proprietary, redacted version of the revised response to NRC RAI 132.

See Attachment B for the proprietary version of the revised response to NRC RAI 132.

**Associated LNP COL Application Revision:**

1. COLA Part 2, FSAR Chapter 9, will be revised to add a new Subsection 9.3.1.1.2, with a LMA of LNP DEP 6.4-2, to read:

9.3.1.1.2 Power Generation Design Basis

Change the third paragraph in DCD Subsection 9.3.1.1.2. as follows:

The high-pressure air subsystem consists of one compressor, its associated air purification system and controls, and a high-pressure receiver. It provides clean, oil-free, high-pressure air to recharge the main control room emergency habitability system cylinders, refill the individual fire fighting breathing air bottles, and recharge the generator breaker reservoir. Quality Verification Level E air as defined in ANSI/CGA G-7.1, with a pressure dew point of 40°F or lower at 3400 psig or greater, is produced by this subsystem. See Section 6.4 for a description of the main control room habitability system.

2. COLA Part 2, FSAR Chapter 6, will be revised to add a new Subsection 6.4.5.3, with a LMA of LNP DEP 6.4-2, to read:

6.4.5.3 Air Quality Testing

Change DCD Subsection 6.4.5.3. as follows:

Connections are provided for sampling the air supplied from the compressed and instrument air system and for periodic sampling of the air stored in the storage tanks. Air samples of the compressed air storage tanks are taken quarterly and analyzed for acceptable air quality within the guidelines of Table 1 and Appendix C, Table C-1, of Reference 1 with a pressure dew point of 40°F or lower at 3400 psig or greater.

3. COLA Part 2, FSAR Chapter 1, Table 1.8-201, Summary of FSAR Departures from the DCD, will be revised to add the following subsections to the departure description summary:

Departure Number	Departure Description Summary	FSAR Section or Subsection
LNP DEP 6.4-2	6.4.5.3, 9.3.1.1.2	6.4.5.3, 9.3.1.1.2

4. Revise COLA Part 4, TS 3.7.6, SURVEILLANCE REQUIREMENTS, SR 3.7.6.8, to read as follows:

	SURVEILLANCE	FREQUENCY
SR 3.7.6.8	Verify that the air quality of the air storage tanks meets the requirements of Appendix C, Table C-1 of ASHRAE Standard 62 with a pressure dew point of 40°F or lower at 3400 psig or greater.	92 days

5. Revise Part 4, TS Bases B 3.7.6, SURVEILLANCE REQUIREMENTS, SR 3.7.6.8, to read as follows:  
Change TS Bases B 3.7.6, SURVEILLANCE REQUIREMENTS, SR 3.7.6.8 as follows:

Verification that the air quality of the air storage tanks meets the requirements of Appendix C, Table C-1 of ASHRAE Standard 62 with a pressure dew point of 40°F or lower at 3400 psig or greater, is required every 92 days. If air has not been added to the air storage tanks since the previous verification, verification may be accomplished by confirmation of the acceptability of the previous surveillance results along with examination of the documented record of air makeup. The purpose of ASHRAE Standard 62 states: "This standard specifies minimum ventilation rates and indoor air quality that will be acceptable to human occupants and are intended to minimize the potential for adverse health effects." Verification of the initial air quality (in combination with the other surveillances) ensures that breathable air is available for 11 MCRE occupants for at least 72 hours. Verification of the pressure dew point ensures that no water will form in the line, eliminating the potential for freezing at the pressure regulating valve during VES operation. In addition, the dry air ensures the MCRE will remain below the maximum relative humidity to support the 90°F WBGT required for human factors performance.

6. COLA Part 7, Departure 6.4-2, Affected DCD/FSAR Sections will be revised to add the following subsections:

Departure Number LNP DEP 6.4-2:

Affected DCD/FSAR Sections: 6.4.5.3, 9.3.1.1.2

**Attachments to Response to NRC:**

- A. Non-proprietary version of the revised response to NRC RAI 132.
- B. Proprietary version of the revised response to NRC RAI 132.

**Attachment A**  
**Revised Response to NRC RAI Question 132**  
**(Non - Proprietary)**

**Response**

[

] (a,c)

] (a,c)

] (a,c) This is derived by applying Note 6 in Table 1 from CGA G-7.1-2004. Note 6 states, "...For breathing air used in conjunction with a self-contained breathing apparatus in extreme cold where moisture can condense and freeze causing breathing apparatus to malfunction, a dew point not to exceed -65°F (24 ppm v/v) or 10°F lower than the coldest temperature expected in the area required." Applying the '10°F lower than the coldest temperature expected' criteria prevents the formation of water droplets in the VES line while also conservatively adding more moisture to the MCR for calculation of the wet-bulb globe temperature (WBGT). This criterion prevents the pressure regulating valve from freezing while providing the maximum possible VES air contribution to MCR relative humidity.

The MCR WBGT limit of 90°F is not reached with the maximum pressure dew point of -22°F. Rearranging the formula for WBGT, the maximum psychrometric wet bulb to maintain 90°F WBGT at 95°F dry bulb is 86°F.

$$WBGT = 0.7 T_{nwb} + 0.3 T_g$$

$$(WBGT - 0.3 T_g) / 0.7 = T_{nwb}$$

$$(90^\circ\text{F} - 0.3 * 95^\circ\text{F}) / 0.7 = T_{nwb}$$

$$T_{nwb} = 87.9^{\circ}\text{F} - 2^{\circ}\text{F} = 85.9^{\circ}\text{F}_{wb}$$

$$T_{wb} = 86^{\circ}\text{F}$$

Using the psychrometric chart and plotting  $95^{\circ}\text{F}_{db}/86^{\circ}\text{F}_{wb}$  the approximate maximum relative humidity is 65%. The VES humidity calculation (ref. 2) shows the MCR will reach a maximum RH of 45% during VES operation with 11 occupants. ] (a,c) prevents freezing at the regulator and maintains the MCR below the maximum WBGT of  $90^{\circ}\text{F}$ .

The moisture requirement is not specified in the license. The dryness of the VES air is important to maintaining a clear (unfrozen) path to the MCR and supporting the WBGT in the MCR. ]

] (a,c)

(a,c)

] (a,c)

Since the CAS equipment is the driver for the VES air it is proposed to add a minimum dew point statement to Tier 2 Section 9.3.1.1.2. To provide assurance the CAS dryer is operating properly, an addition to SR 3.7.6.8 will be made to test so that the pressure dew point is  $40^{\circ}\text{F}$  or less at a pressure of 3400 psig or greater.  $40^{\circ}\text{F}$  is conservatively selected considering the actual dew point is expected to be lower. The dew point shall be sampled upstream of the pressure regulating valve to discover any moisture issues before freezing the regulator.

Similar to the ASHRAE pollutants, there is not a credible path for moisture to enter the tanks once they are filled; therefore the 92 day surveillance is acceptable for dew point. Performance of SR 3.7.6.6 occurs every 31 days using a minimum of 900 cu.ft. from one bank of tanks. In a case of dryer degradation while refilling the used bank after SR 3.7.6.6, the plant would enter LCO 3.7.6, Condition F. This would give the plant 7 days to return the bank of tanks to operable status.

#### Referenced Technical Documents:

1. CGA G-7.1-2004, Commodity Specification for Air
2. APP-VES-M3C-107, Rev.1, Main Control Room Relative Humidity during VES Operation
3. ASHRAE Fundamentals 2009, I-P Edition, pages 1.7, 1.8

CAW-15-4325  
18 December 2015

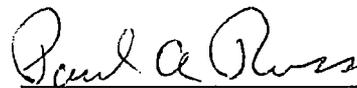
AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

SS

COUNTY OF BUTLER:

I, Paul A Russ, am authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of my knowledge, information, and belief.



Paul A Russ, Director

US Licensing and Regulatory Affairs

- (1) I am Director, US Licensing and Regulatory Affairs, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.
- (2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse Application for Withholding Proprietary Information from Public Disclosure accompanying this Affidavit.
- (3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.
- (4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
  - (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.
  - (ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Westinghouse policy and provide the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

    - (a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of

Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

- (b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.
  - (c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.
  - (d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.
  - (e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.
  - (f) It contains patentable ideas, for which patent protection may be desirable.
- (iii) There are sound policy reasons behind the Westinghouse system which include the following:
- (a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.
  - (b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.
  - (c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

- (d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.
  - (e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.
  - (f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.
- (iv) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, it is to be received in confidence by the Commission.
- (v) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.
- (vi) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in APP-VES-GF-006 Revision 0, "Request for Additional Information Letter No 132 (#8252): Main Control Room Heat Load Question 09.04.01" for submittal to the Commission, being transmitted by APOG letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse is that associated with the topic of Main Control Room Heat Load and may be used only for that purpose.
- (a) This information is part of that which will enable Westinghouse to:
    - (i) Provide the NRC and customers with technical information on the on the Main Control Room Heat Load Evaluations.

- (b) Further this information has substantial commercial value as follows:
- (i) Westinghouse plans to sell the use of similar information to its customers for the purpose of providing more products and services.
  - (ii) Westinghouse can sell support and defense of industry guidelines and acceptance criteria for plant-specific applications.
  - (iii) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar systems in commercial power reactors and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

**Proprietary Information Notice and Copyright Notice  
(2 pages including cover)**

### **PROPRIETARY INFORMATION NOTICE**

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the Affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

### **COPYRIGHT NOTICE**

The reports transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies of the information contained in these reports which are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2.390 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection notwithstanding. With respect to the non-proprietary versions of these reports, the NRC is permitted to make the number of copies beyond those necessary for its internal use which are necessary in order to have one copy available for public viewing in the appropriate docket files in the public document room in Washington, DC and in local public document rooms as may be required by NRC regulations if the number of copies submitted is insufficient for this purpose. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary.