LevyCountyRAIsPEm Resource

From: Habib, Donald
Sent: Monday, September 14, 2015 10:21 AM
To: LevyCountyRAIsPEm Resource
Subject: RAI Letter No. 132 Related to SRP Section 9.4.1, Control Room Area Ventilation System, for the Levy Nuclear Plant Units 1 AND 2 COL Application
Attachments: 2015-09-14 RAI Letter 132 for MCR Dose SCVB 8252.docx

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Subject: RAI Letter No. 132 Related to SRP Section 9.4.1, Control Room Area Ventilation System, for the Levy Nuclear Plant Units 1 AND 2 COL Application
Sent Date: 9/14/2015 10:20:53 AM
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From: Habib, Donald

Created By: Donald.Habib@nrc.gov

Recipients:
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UNITED STATES
NUCLEARREGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 14, 2015

Mr. Christopher M. Fallon
Vice President, Nuclear Development
Duke Energy Florida, Inc.
P.O. Box 1006 – EC12L
Charlotte, NC 28201-1006

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 132 RELATED TOSTANDARD REVIEW PLAN SECTION9.4.1, CONTROL ROOM AREA VENTILATION SYSTEM, FOR THE LEVY NUCLEAR PLANT UNITS 1AND 2 COMBINED LICENSE APPLICATION

Dear Mr. Fallon:

By letter dated July 28, 2008, as supplemented by a letter dated September 12, 2008, Progress Energy Florida, Inc., now Duke Energy Florida, submitted its application to the U. S. Nuclear Regulatory Commission(NRC) for a combined license (COL) for two AP1000 advanced passive pressurized waterreactors pursuant to 10 CFR Part 52. The NRC staff is performing a detailed review of thisapplication to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of thereview. The staff's request for additional information (RAI) is contained in the enclosure to thisletter.

To support the review schedule, you are requested to respond within 30 days of the date of thisletter. If changes are needed to the final safety analysis report, the staff requests that the RAIresponse include the proposed wording changes.

C. Fallon

If you have any questions or comments concerning this matter, you may contact me at 301-415-1035.

Sincerely,

Donald Habib, Project Manager
Licensing Branch 4
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-029
52-030

eRAI Tracking No. 8252

Enclosures:
Requests for Additional Information

C. Fallon

If you have any questions or comments concerning this matter, you may contact me at 301-415-1035.

Sincerely,

Donald Habib, Project Manager
Licensing Branch 4
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-029
52-030

eRAI Tracking Nos. 8252

Enclosures:
Requests for Additional Information

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*Approval captured electronically in the electronic RAI system.

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Request for Additional Information Letter 131, RAI 8252

Issue Date: 09/14/2015
Application Title: Levy County, Units 1 and 2 - Dockets 52-029 and 52-030
Operating Company: Duke Energy Florida
Review Section: 09.04.01 - Control Room Area Ventilation System

QUESTIONS

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-&.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).

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