September 20, 2010

MEMORANDUM: Jeffrey Cruz, Chief
AP1000 Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

FROM: Donald Habib, Project Manager **/RA/**
AP1000 Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

SUBJECT: AUDIT SUMMARY – APRIL 13-14, JUNE 7, JULY 26, AND AUGUST 23, 2010, REVIEW OF CALCULATIONS SUPPORTING EVALUATION OF CONTROL ROOM HABITABILITY FOR VOGTLE UNITS 3 AND 4 COMBINED LICENSE APPLICATION

This report summarizes a series of four audits of applicant documentation related to the evaluation of control room habitability for the Vogtle Units 3 and 4 combined license application. NRC conducted the audits at the Westinghouse Twinbrook offices in Rockville, Maryland. The purpose of the audits was to verify that a postulated accidental release or explosion of the chemicals planned to be stored onsite would not result in an unacceptable hazard to control room operators.

The audits were attended by the following U.S. Nuclear Regulatory Commission (NRC) personnel:

- Seshagiri Tammara (NRO/DSER/RSAC), Technical Reviewer for evaluation of potential accidents (April 13, 2010 only)
- Shie-Jeng Peng (NRO/DSRA/SPCV), Technical Reviewer for control room habitability (all four audits)
- Don Habib (NRO/DNRL/NWE1), Project Manager for Vogtle COLA Chapter 6 (all four audits)

The audits were accomplished by reviewing documents provided by the applicant. Applicant representatives were not present at the audits to discuss the documents. Discussions of issues and questions identified at the audits occurred following the audits at a public meeting and public conference calls with the applicant.

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April 13-14, 2010, Audit

Below is a summary of each audit, including the documents reviewed, the issues and questions identified, and the follow-up communications:

The staff reviewed the following proprietary calculations:

- APP-PGS-M3C-002, "Plant Gas System Hydrogen Explosion Evaluation"
- APP-PGS-M3C-010, "Revision 0, AP1000 Hydrogen Gas Explosion Evaluation"
- APP-VES-M3C-006, Revision 0, "Main Control Room Emergency Habitability from Toxic Chemical Effluents"

The staff and the applicant discussed concerns related to the audit on April 15, 2010, at a public meeting addressing open issues related to NRC's review of the Vogtle Units 3 and 4 COLA. At the public meeting, the staff identified the following four action items related to the audit:

1. Provide a parametric/sensitivity analysis of stability class and wind speed for all chemicals.

2. Explain the venting of the hydrazine tank, and explain how the evaporation of hydrazine affects calculations for flammability.

3. Provide the results of the 500 cubic feet of hydrogen gas explosion scenario calculations.

4. Provide either any detection/alarm system to alert the operator to take action within two-minutes of a chemical release or demonstrate with HABIT run that the maximum allowed control room concentration is reached and is below immediately dangerous to life and health levels.

June 7, 2010, Audit

The staff reviewed the following proprietary calculation:

- APP-VES-M3C-006, Revision 1, "Main Control Room Emergency Habitability from Toxic Chemical Effluents."

The staff and the applicant discussed concerns related to the audit on June 8, 2010, at a public conference call addressing open issues related to NRC's review of the Vogtle Units 3 and 4 COLA. At the public conference call, the staff identified the following two issues related to the audit:

- The calculation did not address concentrations occurring more than 2 minutes from the time of release; and
- The input scenarios did not address wind speeds below 1 m/s.

Subsequent to the call, NRC issued RAI #4856 to address the issues related to April 13-14 and June 7, 2010 audits.

July 23, 2010, Audit

The staff reviewed the following proprietary calculation:

- APP-PGS-M3C-011, Revision 0, "AP1000 Gas Spill or Release Effects on Control Room Habitability," dated July 16, 2010.

The staff and the applicant discussed a concern related to the audit on July 27, 2010, at a public conference call addressing open issues related to NRC's review of the Vogtle Units 3 and 4 COLA. At the public conference call, the staff identified the following issue related to the audit:

- The model input value for the control room air exchange rate differed from and was less conservative than the value specified in a previous March 5, 2010, RAI response provided by the applicant.

August 23, 2010, Audit

The staff reviewed the following proprietary calculations:

- APP-PGS-M3C-011, Revision 0, "AP1000 Gas Spill or Release Effects on Control Room Habitability," dated July 16, 2010.
- APP-PGS-M3C-011, Revision 1," AP1000 Gas Spill or Release Effects on Control Room Habitability," dated August 12, 2010

The staff and the applicant discussed a question related to the audit on August 24, 2010, at a public conference call addressing open issues related to NRC's review of the Vogtle Units 3 and 4 COLA. At the public conference call, the staff asked for the basis for the model input value for the wind speed measurement height.

Subsequent to the call, NRC issued RAI #4856 to address the issues related to April 13-14 and June 7, 2010 audits.

July 23, 2010, Audit

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Docket Nos.: 52-025 and 52-026

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