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February 22, 2005

Document Control Desk U.S. Nuclear Regulatory Commission Washington DC 20555

Mr. Jesse L. Funches Chief Financial Officer U.S. Nuclear Regulatory Commission 11555 Rockville Pike Rockville, MD 20852

Subject: Submittal and Request for Waiver of NRC Review Fees for Topical Report, "Guideline for Performing Defense-in-Depth and Diversity Assessments for Digital Upgrades: Applying Risk-Informed and Deterministic Methods" (EPRI 1002835, December 2004)

Dear Sirs:

This letter is being submitted to the U.S. Nuclear Regulatory Commission (NRC) to accomplish two purposes:

- 1. Provide for NRC review a topical report of high importance to U.S. nuclear utilities per 10CFR50.4. It provides an alternative methodology to comply with Branch Technical Position 19 that will be referenced in multiple licensee submittals, starting this year;
- 2. Request waiver of NRC review fees for this document per 10CFR170.11.

As discussed in the enclosed report, current regulatory guidance recommends that a Defense-in-Depth and Diversity (D3) evaluation be performed for selected upgrades to confirm that the plant has adequate coping capability for digital system common-cause failures. This largely deterministic approach sometimes results in significant licensee and NRC resources spent on events, components, and backup systems that do not:

- contribute significantly to plant risk,
- address other events that may be significant contributors,
- improve plant safety.

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The industry has developed a D3 approach for digital upgrades that would provide a better focus on plant safety, while ensuring any backups added provide value in terms of plant safety or risk.

This topical report is an outgrowth of NEI 01-01, "Guideline on Licensing Digital Upgrades – A Revision to EPRI TR-102348 to Reflect Changes to the 10 CFR 50.59 Rule", March 2002. NEI 01-01 describes how digital instrumentation and control (I&C) and the associated licensing issues can be addressed in the design modification process and in 10 CFR 50.59 evaluations. It also provides high-level guidance on dealing with the issue of digital common cause failures (CCFs).

NEI 01-01 was endorsed by the NRC in Regulatory Issue Summary 2002-22. The guidance provided in this new report (EPRI 1002835) is consistent with and supplements the guidance in NEI 01-01, specifically in the area of D3 evaluation and use of risk insights in performing the evaluation.

The development of this report was overseen by an industry working group that evolved from the task force that oversaw the development of NEI 01-01. EPRI's I&C Steering Committee, which oversees all EPRI-funded I&C projects, has consistently ranked the completion of this D3 topical report as the highest priority I&C project in the industry, in recognition of its critical role in supporting digital upgrades necessary for dealing with obsolescence. This concern is amplified given that most, if not all U.S. plants will seek license renewal for an additional 20 years.

The methodology in this topical report will be widely used by industry. Obsolescence of old analog systems will lead to a need to replace reactor instrumentation and control systems for many plants before end-of-life. Replacement systems based on digital technology will offer greatly improved reliability and safety performance over existing analog systems, but new digital systems will need to meet regulatory requirements, including a demonstration that the plant has adequate coping capability for potential common-mode failures in software. Although NUREG-0800 (NRC's Standard Review Plan), BTP-19, NRC's approval of NEI 01-01, and other regulatory documents make it clear that D3 evaluations are not required for <u>all</u> digital upgrades, it is clear that a formal D3 assessment <u>is</u> expected for substantial digital replacements of Reactor Trip Systems (RTSs) and Engineered Safety Features Actuation Systems (ESFASs).

Licensees will begin to apply the evaluation methodology in this report starting this year. At least two plants are planning on digital upgrades that will require a D3 evaluation in 2005. More plants will use this methodology in 2006 and beyond. One plant intends to submit an application for a digital upgrade during the second quarter 2005 that will request approval based on a pilot application of methods from this topical report.

Fee Waiver Justification

This topical report provides an alternative approach to NUREG/CR-6303 – one that complies with BTP-19 in a manner that improves both safety and regulatory efficiency and effectiveness. It focuses regulatory reviews on safety-significant issues. Its approval will allow for standard implementation of a generic methodology that will reduce or eliminate licensee-specific exemption requests, thereby reducing staff review time. It provides a more comprehensive and robust method for reviewing all safety-significant contributing scenarios to software CCF,

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thereby improving safety. Further, it is responsive to the Commission's guidance to increase the use of risk-informed methods and data.

The waiver of review fees for this topical report would be consistent with the previous related fee waiver. In 2002, the NRC reviewed Revision 1 of the Licensing Guideline (published as NEI 01-01), which was written to address treatment of digital systems under the revised 10 CFR 50.59. NRC reviewed NEI 01-01 under a fee waiver. This new guideline on risk-informed D3 is effectively a derivative of NEI 01-01.

NRC review and approval of this report will improve NRC's generic guidance for conducting D3 evaluations of digital upgrades. Specifically, this report provides "… a means of exchanging information between industry organizations and the NRC for the specific purpose of supporting the NRC's generic regulatory improvements or efforts", per 10CFR170.11 (a)(1) (iii).

Industry is prepared to meet with NRC staff to discuss the content of this report, the need for its approval as an acceptable means of complying with BTP-19, and the benefits to NRC from this document in terms of generic regulatory improvement. We would appreciate the opportunity for a meeting with cognizant NRC staff within the next 1-2 months.

Sincerely,

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Anthony R. Pietrangelo

- Enclosure "Guideline for Performing Defense-in-Depth and Diversity Assessments for Digital Upgrades: Applying Risk-Informed and Deterministic Methods" (EPRI 1002835, December 2004)
- c: Thomas Alexion, NRR/NRC David J. Modeen, EPRI