UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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October 21, 2008

MEMORANDUM TO: Thomas B. Blount, Deputy Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

FROM: Leonard D. Wert, Jr., Director **/RA/ by JMoorman for**
Division of Reactor Projects
Region II

SUBJECT: TASK INTERFACE AGREEMENT - EMERGENCY CORE COOLING SYSTEM (ECCS) VOIDING RELATIVE TO COMPLIANCE WITH SURVEILLANCE REQUIREMENTS (SR) 3.5.1.1, 3.5.2.3, AND 3.5.3.1 (TIA 2008-03)

This Task Interface Agreement documents the applicable NRC staff position agreed upon between Region II and the Office of Nuclear Reactor Regulation.

While performing Ultrasonic Testing (UT) on ECCS piping in response to Generic Letter (GL) 2008-01, the licensee discovered voiding in the 12-inch diameter 2A core spray pump discharge line at Brunswick. This void was characterized by a 14-inch circumferential distance along the top periphery of the pipe, a 3.3-inch in depth from the top dead center of the pipe, and a length of 10 feet 6 inches. Attempts to vent this void by opening the system high point vent were unsuccessful.

Licensee Position: Following discovery of the void, the licensee performed an operability determination (OD) that concluded the system was capable of performing its specified safety function and therefore operable. The inspectors reviewed the licensee's OD and were in agreement that the system could perform its technical specifications (TSs) specified safety function. However, the inspectors questioned the licensee's compliance with the TSs surveillance requirement which requires the system piping to be filled with water.

Applicable Regulatory Staff Position: The staff's applicable regulatory position with respect to TSs issues are generally bounded by the words of the TS itself (legal requirement), the staff position in NUREG-1433, Standard Technical Specifications (STS) General Electric Plants, BWR/4 for the design in question, and the safety evaluation that approved the applicable TS. In this particular case, the applicable regulatory position is also informed by the staff positions established in Generic Letter 2008-01, ECCS Gas Accumulation. These positions are discussed below.

CONTACTS: Randall A. Musser, RII/DRP, 404-562-4603
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10 CFR 50.36(d)(3), Surveillance requirements, defines surveillance requirements as "requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation (LCO) will be met."

The Brunswick Technical Specification Surveillance Requirements (SRs) 3.5.1.1, 3.5.2.3, and 3.5.3.1 specify tests requiring the licensee to "[v]erify, for each ECCS injection/spray subsystem (RCIC System), the piping is filled with water from the pump discharge valve to the injection valve."

The Brunswick TSs Bases for SRs 3.5.1.1, 3.5.2.3, and 3.5.3.1 include a summary statement of the bases or reasons for the surveillance requirements which state that:

> [t]he flow path piping of each ECCS has the potential to develop voids and pockets of entrained air.
>
> Maintaining the pump discharge lines of the HPCI System, CS subsystems, and LPCI (and RCIC) subsystems full of water ensures that the ECCS (and RCIC) will perform properly, injecting its full capacity into the RCS upon demand. This SR also prevents water hammer in the piping following an ECCS initiation signal. One acceptable method of ensuring that the lines are full is to vent at the high points. The 31 day frequency is based on the gradual nature of void buildup in the ECCS piping (and RCIC System), the procedural controls governing system operation, and operating experience.

The above mentioned Bases establishes actions as a means to verify that safety system piping is filled with water. They are consistent with 10 CFR 50.36(d)(3) requirements to assure the necessary quality of systems is maintained in accordance with the plant license basis.

Installed high point vents are designed to reduce accumulated gases. However, there is no expectation that venting operations will entirely eliminate the time dependant accumulation of voids from piping as noted in the Bases for Brunswick TS issued on June 5, 1998 adopting NUREG-1433 improved STS. The Brunswick SRs Bases state that one acceptable method of ensuring (verifying) the piping is full is to vent at the high point vents on a monthly frequency due to the gradual nature of void buildup in the piping, thereby applying procedural controls governing system operation, and operating experience. A method of successful verification is not given in the Brunswick surveillances, rather a method is provided in the Bases for these SRs.

The Brunswick SRs Bases verification that piping is full of water by venting at the high point vents is similar to verification criteria required in surveillance requirements for operating license technical specifications issued in the early 1980s. The 1982 Appendix A Technical Specifications for Susquehanna Steam Electric Station, Unit No. 1, SR 4.5.1.a.1.a)1 required "[v]erifying that the system piping from the pump discharge valve to the system isolation valve is filled with water by: 1. Venting at the high point vents" (NUREG-0931 dated July 1982 (NUDOCS Accession No. 8208040344)). The Brunswick plants operating licenses were issued in mid-1975 while the staff guidance was evolving to add verification criteria to TS surveillances. In the period between 1975 and 1982 the staff articulated its expectation that air gradually built up in piping would be vented using applicable system high point vents and since that time this

position was applied to operating reactor licenses. This position has been retained in improved STS, albeit in a changed format.

By adopting the NUREG-1433 STS testing requirements, including the Bases method for a successful verification that piping is full of water, the Brunswick plant incorporated TSs changes which took advantage of the evolution in policy and guidance as to the required content and preferred format of TSs over time. In determining the acceptability of such changes, the staff interprets the requirements of 10 CFR 50.36, using as a model the accumulation of generically approved guidance in the improved STS.

In recognition of the potential for voiding to occur in locations not vented during TS surveillances or by plant procedures, or which may re-occur by gas that accumulates between venting operations, the NRC staff issued GL 2008-01. This GL included the following in its four principal concerns:

> (3) **Testing.** Criteria V and XI of Appendix B to 10 CFR Part 50 and the operating license require licensees to perform testing using written test procedures that incorporate the requirements and acceptance limits contained in applicable design and licensing documents and Criterion XVII requires appropriate records. Testing of portions of piping and components in the subject systems where unacceptable gas accumulation may occur is necessary to confirm acceptance limits and operability unless it has been established that some portions may be excluded. Surveillance and testing that do not ensure operability prior to the next surveillance are not consistent with this testing requirement.

Addressing the principal concern of testing developed in response to the GL and in follow-up programs may result in policy requiring revision to the model of generically approved guidance in the improved STS. The staff may decide to distinguish between current SRs Bases verification criteria to maintain systems “full of water” and more descriptive language connoting completely filled with water such as a “water-solid” condition. Nonetheless, in the case of Brunswick, the operability evaluation shows the system is operable with the air and under the current surveillance requirement.

<u>Conclusion</u>: When voids are discovered in piping, if the licensee can establish through an operability determination that there is a reasonable expectation that the system in question will perform its specified safety function, the system piping can be considered filled with water such that the surveillance requirement is met. In the case of Brunswick Technical Specifications, the licensee’s position that the surveillance requirements can be met in the presence of known and properly evaluated voids is consistent with the applicable staff regulatory position and would not constitute a violation.

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