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PY-CEI/NRR-3024L

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Washington, DC 20555-0001

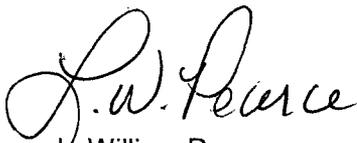
Perry Nuclear Power Plant  
Docket No. 50-440

**Subject: Response to a Request for Additional Information on a License Amendment Request to Revise Required Action B.1 in Technical Specification 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation" (TAC NO. MD1187)**

In a letter dated January 31, 2007, the Nuclear Regulatory Commission requested that additional information be provided to complete the review of a license amendment request submitted by letter dated February 10, 2006 (PY-CEI/NRR-2930L). The amendment request revises Required Action B.1 in the Emergency Core Cooling System (ECCS) Instrumentation Specification to be consistent with the Improved Technical Specifications (ITS). The attachment to this letter provides the requested information.

There are no regulatory commitments contained in this letter or its attachment. If there are any questions or if additional information is required, please contact Mr. Henry L. Hegrat, Supervisor – FENOC Fleet Licensing, at (330) 374-3114.

I declare under penalty of perjury that the foregoing is true and correct. Executed on March 8, 2007



L. William Pearce

Attachment: Response to NRC Request for Additional Information dated January 31, 2007

cc: NRC Project Manager  
NRC Resident Inspector  
NRC Region III  
State of Ohio

A002

**Response to NRC Request for Additional Information dated January 31, 2007**

In a Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) dated January 31, 2007, the NRC provided the following background, along with two questions:

**Background:** The proposed action of this request is to delete Required Actions B.1.2.1 and B.1.2.2, which were added into Perry TS 3.3.5.1, during the ITS conversion process. Perry Required Action B.1 will then match the ITS Required Action B.1, but will continue to deviate from the format of ITS which contain a limiting condition for operation for secondary containment isolation instrumentation. As a result, actions with a 1-hour completion time will only be required for the annulus exhaust gas treatment (AEGT) system if a loss of initiation capability in both divisions actually exists for an AEGT initiation function. Current requirements to trip inoperable channels initiating AEGT within 24 hours are retained.

**Question 1:** Discuss how the Perry-specific actions contained in Required Actions B.1.2.1 and B.1.2.2 could result in an operator misinterpretation of Condition B requirements. This information is needed to understand if there is a plant safety issue related to the licensee statement in Section 3.0 of the license amendment request (LAR):

“...the current wording of Required Action B.1 [B.1.2.1 and B.1.2.2] is [Perry]-specific, and that portion:

- includes actions that must be taken even when only a single channel has become inoperable, and a "loss of initiation capability" has not occurred in both divisions,
- conflicts with the Bases for the Required Action, and
- could result in an operator misinterpretation.”

**Response to Question 1:** As stated in Section 4.0, “Technical Analysis,” of the enclosure to the letter dated February 10, 2006, “The proposed revision to delete the sub-actions in B.1.2 will reduce the *potential* [emphasis added] for operator misinterpretations. With the current format of Required Action B.1, it appears that all the AEGT actions are self-contained within Required Action B.1.2 (sub-actions B.1.2.1 and B.1.2.2), with no AEGT requirements in B.1.1. ... Required Action B.1.1 requires that if neither division of a feature addressed by this specification (such as AEGT) will initiate on a signal from one of the applicable Functions, then the "supported feature(s)" must be declared inoperable. In such a case, for AEGT, this would require both AEGT divisions to be declared inoperable. Therefore, *the appearance of an option to instead place the subsystems into operation (in B.1.2) is misleading* [emphasis added].”

It should be noted that the potential for such a misinterpretation of the current Technical Specification (TS) wording is low due to the training the licensed plant operators receive, and due to their understanding of the Technical Specifications. However, in the unlikely situation when there are enough instruments inoperable and untripped in a particular Function<sup>1</sup> such that a loss of initiation capability has occurred in both divisions for that Function, such a misinterpretation could result in the following.

- 1) After one hour, the operators would comply with Required Action B.1.2.1 by placing both subsystems in operation. Both AEGT subsystems would then be capable of automatically re-

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<sup>1</sup> For these discussions, note that a “feature” as discussed in Required Action B.1 is a system that is initiated by these instruments (for TS 3.3.5.1, the AEGT system is one feature, the diesels are a second feature, and the Emergency Core Cooling System (ECCS) subsystems are a third). Also, throughout the Instrumentation Section of the Improved Technical Specifications (ITS), a “Function” is a monitored parameter that initiates associated features; and each Function is represented as a line item in the TS Tables. Specifically, the two different Functions from TS Table 3.3.5.1-1 that are pertinent to this discussion because the transmitters and trip units are common to the AEGT subsystems, the diesels, and the ECCS subsystems are:

Function a) “Reactor Vessel Water Level - Low Low Low, Level 1” [addressed by Table 3.3.5.1-1 item “a” (item 1.a for Division 1 and 2.a for Division 2)]; and

Function b) “Drywell Pressure-High” [addressed by Table item “b” (item 1.b for Division 1 and 2.b for Division 2)]

starting following a plant event that includes a loss of power; however, the heaters for the charcoal trains would not automatically restart unless the heaters receive a start signal from the other Function.

- 2) Believing all the necessary AEGT actions were completed when the subsystems were placed in operation, the operators would not declare both AEGT subsystems inoperable after one hour as required by B.1.1, and would not enter LCO 3.0.3 as required by TS 3.6.4.3, "Annulus Exhaust Gas Treatment (AEGT) System."
- 3) After 24 hours, they would either place the channels in trip per Required Action B.3 or they would declare the associated subsystem(s) inoperable per Required Action H.1.

As noted above, such a misinterpretation and subsequent sequence of actions is mitigated by operator training.

**Question 2: Discuss how the proposed Perry TS 3.3.5.1 changes will ensure that appropriate actions are taken if multiple, inoperable, untripped channels of level, pressure or combinations of level and pressure instrumentation result in the loss of initiating capability for AEGT in one division. If there is a difference in the operational consequences that would result from applying TS requirements for multiple inoperable channels discovered during testing, as opposed to discovery made during maintenance or repair, discuss how the proposed TS changes will ensure appropriate actions are taken. This information is needed to demonstrate that the licensee's proposed TS 3.3.5.1 changes will correct the stated problem of unintended [operational] consequences (Section 4.0 of LAR), resulting from writing ITS 3.3.6.2 actions into Perry to conform to TS 3.3.5.1 and show that the proposed actions are appropriate for loss of initiating capability for AEGT in one division.**

**Response to Question 2:** The 24-hour Completion Time that is being maintained in the Perry Nuclear Power Plant (PNPP) TS 3.3.5.1 for situations when the loss of automatic initiation capability has occurred in only one division of the AEGT system is the appropriate Completion Time. In such situations, the other division maintains automatic initiation capability in response to a valid signal from a Function. The 24-hour Completion Times provided throughout the TS Instrumentation Section are supported by the Topical Reports<sup>2</sup> that analyzed various combinations of instrumentation logics, including the "two-out-of-two in each Division" logic for each Function that serves the ECCS subsystems, the diesels, and the AEGT subsystems in TS 3.3.5.1. The TS Bases that reference these Topical Reports explain the rules of TS usage, and are clear that the shorter 1-hour Completion Times are only necessary when BOTH DIVISIONS of a feature would not be capable of initiating on a valid signal from a Function. Unless both divisions are affected for a Function, the 24-hour Completion Time justified by the Topical Reports may be applied.

The TS usage rules that limit use of the 24-hour Completion Time were developed after the Topical Reports were already approved; the entire topic of how a 'loss of initiation capability check' is performed and why they are performed was discussed in a 1994 PNPP letter dedicated to this concept<sup>3</sup>. That letter and the proposed Bases discussions included therein explain that when the plant is in the very limited 24-hour out-of-service time, the initiation logic is recognized as not being single-failure-proof, however this is acceptable due to the time limits placed on such outages. An NRC Generic Letter<sup>4</sup> provides a summary of how the single-failure design concept is addressed in the Technical Specifications. In part, it notes that "The specified time to take action, usually called the equipment out-of-service time, is a temporary relaxation of the single failure criterion..." Due to this concept, although initiation capability for one or more of the Functions may

<sup>2</sup> These Topical Reports are part of the licensing basis of the plant, and are listed as references in each of the applicable TS Bases.

<sup>3</sup> PY CEI/NRR-1694L dated February 22, 1994, "Supplement to Technical Specification Change Request: Increase Surveillance Test Intervals and Allowable Outage Times for Instrumentation (TAC M84057)"

<sup>4</sup> <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/gen-letters/1980/gl80030.html>

have been lost in one division during this limited 24-hour time frame, the other division that is not affected by the inoperable channels for that Function is assumed to remain capable of being initiated to perform the system's design function.

There is no difference in the operational consequences that result from applying TS requirements for single or for multiple channels found to be inoperable during testing versus a discovery made during maintenance or repair. It should be noted that instruments that are purposely placed in an inoperable status solely for performance of required Surveillances do not require entry into the 1-hour actions, due to the 6-hour delay time provided by Note 2 to the TS 3.3.5.1 Surveillance Requirements.

The proposed TS 3.3.5.1 changes will correct the problem of unintended consequences that resulted from writing a portion of the Improved Technical Specifications (ITS) TS 3.3.6.2 'loss of initiation capability' actions into PNPP TS 3.3.5.1 without considering the different format of these two Specifications. The unintended Technical Specification actions that will be corrected by the license amendment include the following.

- Due to the current formatting of B.1.2.1 and B.1.2.2 in PNPP TS 3.3.5.1, within one hour after discovering that a channel in only one out of the two divisions of the initiation circuitry for a Function is inoperable, the operators are required to either place the subsystem supported by the inoperable channel(s) in operation, or declare the subsystem inoperable. In contrast to those PNPP TS requirements, ITS TS 3.3.6.2 requires no action before 24 hours in such a situation. A 24-hour Completion Time is consistent with the other Instrumentation Technical Specifications that apply to these same transmitters and trip units, and is appropriate for the reasons described above.
- Even if the operators place the inoperable channels in trip, thereby re-establishing the ability of the logic to initiate on a valid signal, the operators are still required by B.1.2.1 and B.1.2.2 to either place the associated subsystem in operation or declare that subsystem inoperable within one hour. These are unnecessary actions, and they are inconsistent with the other Instrumentation Technical Specifications, which recognize that when inoperable channels are placed in trip, the 1-hour actions are not necessary.
- Since the PNPP design for the AEGT system requires one subsystem to be operating during normal plant operation, if the inoperable channel(s) is (are) in the opposite division from the currently operating subsystem, after one hour the operators are faced with the decision of whether to shut down the operating ventilation subsystem and start the other subsystem. Unplanned shifting from one AEGT division to the other makes scheduling and performance of charcoal testing (required every 720 hours of subsystem operation) very difficult.

Based on all of the above information, it can be seen that the 24-hour Completion Time that is being maintained by the requested TS change when any combination of inoperable channels only result in the loss of initiating capability for AEGT in one division, is appropriate.