

**John K. Wood**  
Vice President, Nuclear

440-280-5224  
Fax: 440-280-8029

March 1, 2000  
PY-CEI/NRR-2468L

United States Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

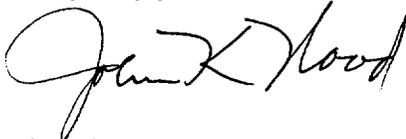
Perry Nuclear Power Plant  
Docket No. 50-440  
Response to Request for Additional Information Related to a License Amendment  
Requesting a 24-Month Operating Cycle (TAC No. MA5930)

Ladies and Gentlemen:

On June 17, 1999, the Perry Nuclear Power Plant (PNPP) staff submitted a license amendment request (PY-CEI/NRR-2398L) to the NRC requesting an extension of various surveillance requirements to support a 24-month operating cycle. The PNPP staff received a Request for Additional Information (RAI) from the NRC on January 27, 2000 regarding this license amendment request. The response to the RAI is contained in Attachments 1 and 2.

If you have questions or require additional information, please contact Mr. Gregory A. Dunn, Manager - Regulatory Affairs, at (440) 280-5305.

Very truly yours,



Attachments

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

A001

## Perry Nuclear Power Plant Responses to an NRC Request for Additional Information (RAI)

The Perry Nuclear Power Plant (PNPP) staff received a Request for Additional Information (RAI) from the NRC dated January 27, 2000. The RAI deals with questions associated with the PNPP license amendment request regarding the extension of various surveillance requirements to support a 24-month operating cycle. The responses to the RAI are contained in the following paragraphs.

### NRC QUESTION

1. Your application of June 17, 1999, requested that the frequency of the following Technical Specification (TS) Surveillance Requirements (SRs) be extended from once every 18 months to once every 24 months:

- |            |  |
|------------|--|
| SR 3.8.4.3 | Visual examination of battery cells, cell plates, and racks for signs of physical damage or abnormal deterioration                       |
| SR 3.8.4.4 | Removal of visible corrosion and verification that battery cell to cell and terminal connections are coated with anti-corrosion material |
| SR 3.8.4.5 | Verification of battery connection resistances   |

During a telecon held with your staff on December 14, 1999, the staff voiced concern over the proposed extension between surveillances and noted that these surveillances can be conducted during power operation and are not necessarily linked to the overall proposal to implement a 24 month fuel cycle. Your staff indicated that, in addition to the required TS SRs, weekly and quarterly surveillances are conducted that could provide early identification of abnormal deterioration or corrosion. Your staff also stated that Perry is unique in that the Unit 2 batteries are maintained operable and serve as a backup set of batteries.

Please provide a description of the weekly and quarterly surveillances, how they supplement the TS SRs, their tracking system, and the change control process. In addition, provide how the Unit 2 batteries are handled pursuant to the TS.

### RESPONSE 1A

The extension requests for SRs 3.8.4.3, 3.8.4.4, and 3.8.4.5 are based upon the performance of other more frequently scheduled maintenance testing which provides an equivalent means of evaluating the condition of the battery, which ultimately provides a measure of assurance of continued battery operability.

SR 3.8.4.3 requires an 18-month inspection of battery plates for signs of damage or abnormal deterioration. The surveillance instruction which implements SR 3.8.4.1,

a weekly SR that verifies battery terminal voltage is above a prescribed limit, contains a PNPP requirement to perform a visual inspection of the battery cells and the inter-connecting hardware. This visual inspection is consistent with the recommendations of IEEE Standard 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations," and is performed at a periodicity more frequently than what is recommended. If deficiencies are found, the surveillance instruction requires the conditions to be corrected. The surveillance instruction which implements SR 3.8.4.2, a quarterly SR that verifies the battery terminals and connectors are free from visible corrosion or verifies that battery connection resistance is below a prescribed limit, contains a PNPP requirement to perform a detailed inspection of each battery. This detailed inspection checks the battery cell plates for signs of sulfation, copper contamination, and excessive plate expansion. Battery cells are also inspected for sediment accumulation and signs of post seal deterioration. This detailed inspection is more comprehensive than the inspection required to satisfy the SR, is consistent with the recommendations of IEEE 450-1980, and is performed at a periodicity more frequently than what is recommended by the standard. Therefore, the PNPP staff believes that the performance and frequency of performance of the current activities provides equivalent testing to that required by SR 3.8.4.3, and that SR 3.8.4.3 can be extended to 24 months without adversely affecting battery operability.

SR 3.8.4.4 requires an 18-month visual inspection of battery cell-to-cell and terminal connections, and removal of visible corrosion. The weekly and quarterly testing described in the preceding paragraph requires visual inspections of the battery cell-to-cell and terminal connections. Additionally, the quarterly test requires the removal of visible corrosion, if observed. Therefore, the PNPP staff believes that the performance and frequency of performance of the current activities provides equivalent testing to that required by SR 3.8.4.4, and that SR 3.8.4.4 can be extended to 24 months without adversely affecting battery operability.

SR 3.8.4.5 requires that every 18 months, battery connection resistance be verified within acceptable limits by direct measurement. Although connection resistance measurements are not typically performed at other than the 18-month interval, if there is any indication of visible corrosion at the battery connections, resistance checks are required to be performed to verify that the connection resistance readings are within acceptable limits. This action is required as a step in the quarterly surveillance instruction described above. These measurements will be made at any time there is a question regarding connection integrity, irrespective of the frequency established for SR 3.8.4.5. Therefore, the PNPP staff believes that the performance and frequency of performance of the current activities satisfies the intent of SR 3.8.4.5, and that SR 3.8.4.5 can be extended to 24 months without adversely affecting battery operability.

#### RESPONSE 1B

The requirements associated with the scheduling and performance of Technical Specification SRs are contained in an administrative procedure. This procedure requires the establishment and maintenance of a matrix that cross-references each SR with an implementing surveillance instruction. This provides assurance that the SR requirements are located within an implementing instruction. The administrative

procedure also requires the establishment and maintenance of a surveillance tracking database that contains the due dates of the SRs. This database is used as an input for the scheduling of plant work activities. When a SR has been satisfied, the tracking database is updated to reflect the completion of the SR. The database is then used to calculate the new SR due date. This provides assurance that the SR will be appropriately scheduled.

If a change to a SR were to occur, controls within this procedure will ensure that the cross-reference matrix and the tracking database are revised to reflect the changed information. This procedure also provides guidance to revise the associated surveillance instruction to incorporate the new information. Hence, the performance of the surveillance instruction in the field will be to the changed information.

The aforementioned administrative procedure provides assurance that the Technical Specification SRs are properly scheduled and performed.

### RESPONSE 1C

Although PNPP Unit 2 was never completed, the Unit 2 DC systems were installed and are operational. The Bases for Technical Specification 3.8.4, defines the divisional DC systems as being comprised of both Unit 1 and Unit 2 equipment. Hence, the Unit 2 batteries can be placed into service to support Unit 1 operation, as needed.

Since Technical Specification 3.8.4 is applicable to both Unit 1 and Unit 2 equipment, the SRs contained within the Technical Specification are applied to both Units equipment. That is, the surveillance instructions that are run on the Unit 1 equipment are also run on the Unit 2 equipment.

The administrative procedures that are used for the scheduling and performance of surveillance instructions (described above) are used for the scheduling and performance of the surveillances applicable to the Unit 2 equipment.

### NRC QUESTION

2. TS SR 3.8.4.7, performance of the battery service test, has no mode restrictions. Please explain how this SR is conducted during power operation.

### RESPONSE

Since PNPP has the ability to align the Unit 2 batteries to the Unit 1 DC system, the Unit 1 battery can be taken out of service for performance of this SR, with the Unit 2 battery being used to maintain the overall DC system operable. Refer to Response 1B, above.

### NRC QUESTION

3. Your application of June 17, 1999, proposed that the frequency of SR 3.8.4.7, performance of the battery service test, be extended from once every 18 months to once every 24 months. Note 1 of SR 3.8.4.7 permits performance of a battery performance discharge test in lieu of the battery service test once every 60 months.

During the telecon of December 14, 1999, the staff voiced concern over the proposed extension between surveillances and noted that if a performance discharge test is substituted as allowed by Note 1 of SR 3.8.4.7, a four year period could elapse between performance of successive battery service tests. The staff questioned whether the performance discharge test envelopes the battery service test and noted that NUREG-1434, Revision 1, "Standard Technical Specifications for General Electric Plants BWR/6," substitutes a modified performance discharge test for the performance discharge test for Note 1 to SR 3.8.4.7. The modified performance discharge test, as defined in IEEE-Std-450-1995, is a test, in the as-found condition, of a battery's ability to provide a high-rate, short-duration load (usually the highest rate of the duty cycle) that will confirm the battery's ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rate capacity.

Provide justification that the performance discharge test envelopes either the battery service test or the calculated battery load profile.

### RESPONSE

The issue is the appropriateness of substituting the battery performance discharge test (SR 3.8.4.8) for the battery service test (SR 3.8.4.7) once per 60 months. At PNPP, the battery performance discharge test is conducted at the battery 2-hour discharge rate corrected for temperature. Thus, for the Division 1 and 2 batteries, the battery performance discharge test discharge rate is 390 to 400 amps for two hours. This test is far more demanding than the battery service test which uses the PNPP 2-hour duty cycle, which applies loads of 120 amps for 116 minutes, 300 amps for 3 minutes, and 500 amps for 1 minute. Though the duty cycle shows the highest load component is 500 amps expected during the first minute, the highest calculated load for the first minute is 370 amps for Division 1 and 357 amps for Division 2. Attachment 2 shows the PNPP Division 1 and 2 duty cycle with the 2-hour battery performance discharge test discharge rate superimposed.

The PNPP Division 3 batteries are being replaced this year. 250 amp hour batteries are replacing the originally installed 100 amp hour batteries. In this case, the two-hour rating of the battery will exceed the highest peak load of the duty cycle. Thus, the performance test requirements will far exceed the demand of the duty cycle.

COMMITMENTS

There are no regulatory commitments made in this letter. Any actions described in this document are not regulatory commitments and represent intended or planned actions that are included for the NRC's information. Please notify the Manager - Regulatory Affairs at the PNPP of any questions regarding this document.

## BATTERY TESTING

