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10 CFR 50
10 CFR 51
10 CFR 54

RS-14-313

October 31, 2014

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Byron Station, Units 1 and 2
Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: Response to NRC Request for Additional Information, Set 42, dated October 10, 2014, related to the Braidwood Station, Units 1 and 2, and Byron Station, Units 1 and 2, License Renewal Application

References:

1. Letter from Michael P. Gallagher, Exelon Generation Company LLC (Exelon) to NRC Document Control Desk, dated May 29, 2013, "Application for Renewed Operating Licenses"

2. Letter from Lindsay R. Robinson, US NRC to Michael P. Gallagher, Exelon, dated October 10, 2014, "Request for Additional Information for the Review of the Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2, License Renewal Application, Set 42 (TAC NOS. MF1879, MF1880, MF1881, and MF1882)"

In Reference 1, Exelon Generation Company, LLC (Exelon) submitted the License Renewal Application (LRA) for the Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2 (BBS). In Reference 2, the NRC requested additional information to support staff review of the LRA.

Enclosure A contains the response to this request for additional information.

Enclosure B contains an update to the section of the LRA affected by the response.

There are no new or revised regulatory commitments contained in this letter.

If you have any questions, please contact Mr. Al Fulvio, Manager, Exelon License Renewal, at 610-765-5936.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 10-31-2014

Respectfully,

Michael P. Gallagher
Vice President - License Renewal Projects
Exelon Generation Company, LLC

Enclosures: A. Response to Request for Additional Information
B. Update to affected LRA section

cc: Regional Administrator – NRC Region III
NRC Project Manager (Safety Review), NRR-DLR
NRC Project Manager (Environmental Review), NRR-DLR
NRC Senior Resident Inspector, Braidwood Station
NRC Senior Resident Inspector, Byron Station
NRC Project Manager, NRR-DORL-Braidwood and Byron Stations
Illinois Emergency Management Agency - Division of Nuclear Safety

Enclosure A

Byron and Braidwood Stations (BBS), Units 1 and 2
License Renewal Application
Response to Request for Additional Information

RAI B.2.1.24-1a

RAI B.2.1.24-1a

Applicability:

Byron Station and Braidwood Station (BBS), all units

Background:

By letter dated May 19, 2014, the staff issued request for additional information (RAI) B.2.1.24-1, requesting additional information regarding higher-than expected wear rates in flux thimble tubes at Braidwood Units 1 and 2. In addition, the staff also questioned the adequacy of the program because it was not able to perform examinations on all the tubes.

By letter dated June 9, 2014, the applicant provided a response to the staff's RAI. In the response, the applicant discussed high wear-rate issues, and its failure to obtain data on a few tubes based on outage inspections from 2007 to 2012 for both Braidwood Units 1 and Unit 2. The applicant also stated that several corrective actions are being implemented to address the issues related to completing eddy current examinations. One corrective action was to increase the inspection frequency to perform examinations every outage. The staff closed the issue based on the applicant's response.

During the NRC 71002 inspection at Braidwood in October of 2014, the staff discovered that the applicant was not able to complete eddy current examinations on any of the 58 tubes at Braidwood Unit 1 during the September 2013 outage, and completed only seven of the 58 flux thimble tubes at Braidwood Unit 2 during the May 2014 inspection. The information regarding the Braidwood Unit 1 inspection was not provided to the staff during the onsite audit in December of 2013. In addition, the information regarding the Braidwood Unit 2 inspection along with the Braidwood Unit 1 problems was not discussed in the RAI response dated June 9, 2014.

Issue:

The staff is concerned that the Flux Thimble Tube Inspection aging management program may not be adequate if tube wear examinations are not performed.

Request:

1) Describe results of the latest flux thimble tube inspections at Braidwood Units 1 and 2. Provide specific information where tube wear data were not obtained.
2) Justify the adequacy of the program when tube examinations are not performed as planned.
3) Provide technical basis to assure that tube wear acceptance criteria are met and that the inspection program is adequate.
4) Clarify if there have been similar issues at Byron Units 1 and 2, such as not being able to complete eddy current examinations or failure to obtain data on any of the tubes. Describe cases in which higher-than expected wear or under-predicting of wear has occurred on any of the tubes.

5) Clarify if there have been any leakage events at BBS due to flux thimble tube wear.

Exelon Response:

1) A summary of the recent flux thimble eddy current testing at Braidwood Station, Units 1 and 2 is provided below.

   Braidwood Station, Unit 1

   Full-length eddy current data for all 58 Braidwood Station, Unit 1 flux thimble tubes was obtained in October 2010. Based on this data, 17 of the 58 flux thimble tubes tested had indications of wear. This data indicated that two (2) flux thimble tubes, that were installed during the previous refueling outage, had higher than expected wear. Higher than average flux thimble tube wear during the first cycle of operation is not unusual, but the station chose to conservatively increase the eddy current testing frequency for all flux thimble tubes from every other cycle to every cycle based on this testing result. The highest wall loss measured was 42 percent and all flux thimble tubes were evaluated as acceptable until the next scheduled eddy current test.

   Flux thimble tube eddy current testing was performed in May 2012. The scope of this test was limited to the flux thimble tubes that indicated greater than 20 percent wear in 2010 (16 flux thimble tubes) to allow additional time for under vessel work unrelated to flux thimble tubes, given that the other 42 in-service flux thimble tubes had substantial margin for potential wear that could occur until the next test. Full-length eddy current data was collected on 15 of the specified flux thimble tubes. The other flux thimble tube was designated to be replaced during the outage due to a stuck neutron detector which occurred during cycle operation; therefore eddy current testing was not performed. Full-length baseline eddy current data for the replacement flux thimble tube was collected. The highest wall loss measured was 49 percent and all flux thimble tubes were evaluated as acceptable until the next scheduled eddy current test.

   The latest attempt to perform flux thimble tube eddy current testing on Braidwood Station, Unit 1 was September 2013. Eddy current testing was aborted after attempting to collect data on 22 of the 58 flux thimble tubes. Due to restrictions in these flux thimble tubes, multiple eddy current probe cables were damaged (kinked) while attempting to push the eddy current probe past the restriction. The eddy current probe was unable to be inserted beyond the expected area of wear (see Table 1, Note 6) on any of the attempted flux thimble tubes. This was the first time that there was a broad inability to collect flux thimble tube eddy current data on Braidwood Station, Unit 1. The inability to obtain flux thimble tube full-length eddy current data was entered into the corrective action program. Due to the lack of eddy current data, the flux thimble tubes were evaluated using previous data, conservative wear rate projections, and conservative acceptance criteria, as described in Exelon Response 2) below. Because of this evaluation, two (2) flux thimble tubes were proactively removed from service (capped) prior to plant startup. The projected wall loss at the next scheduled eddy current test

for all remaining flux thimble tubes was determined to be 51 percent or less, therefore continued operation with these tubes in service was acceptable. The next performance of flux thimble tube eddy current testing is scheduled for the Spring 2015 outage.

Braidwood Station, Unit 2

Full-length eddy current data for 57 of 58 Braidwood Station, Unit 2 flux thimble tubes was obtained in May 2011. Usable eddy current data was not collected on one (1) flux thimble tube during this test due to a flux thimble tube restriction. This flux thimble tube was conservatively removed from service due to the lack of eddy current data. This is a correction to information provided in Exelon letter RS-14-165, dated June 9, 2014. In the response to RAI B.2.1.24-1, request 2, second paragraph, it was stated that full-length eddy current data was able to be collected on all accessible flux thimble tubes in May 2011. This discrepancy was discovered during a review of test data while preparing this response to RAI B.2.1.24-1a. Based on this data, 34 of the 57 flux thimble tubes tested had indications of wear. This data indicated that two (2) flux thimble tubes had higher than expected wear. One of these flux thimble tubes had been replaced in the previous outage, and the other flux thimble tube was an original equipment flux thimble tube. Because of these indications of higher than expected wear, the eddy current testing frequency for all flux thimble tubes was changed from every other cycle to every cycle. The highest wall loss measured was 57 percent and all flux thimble tubes were evaluated as acceptable until the next scheduled eddy current test.

Flux thimble tube eddy current testing was next performed in November 2012. The scope of this test was intentionally abbreviated to 28 flux thimble tubes due to difficulties encountered during eddy current testing. Full-length eddy current data was collected on 26 of the tested flux thimble tubes. The eddy current probe encountered a restriction in the remaining two (2) flux thimble tubes. The restriction was encountered before the area of expected wear on one (1) flux thimble tube and beyond the area of expected wear on the other flux thimble tube. Therefore, useable eddy current data was collected on 27 of the 28 flux thimble tubes tested. Two (2) flux thimble tubes were removed from service (capped); one for not obtaining eddy current data in the area of expected wear and the other for having a measured wall loss of 60 percent. The highest wall loss measured for the remaining flux thimble tubes was 52 percent and all remaining flux thimble tubes were evaluated as acceptable until the next scheduled eddy current test.

The latest attempt to perform flux thimble tube eddy current testing at Braidwood Station, Unit 2 was May 2014. Eddy current testing was attempted on 39 of 58 flux thimble tubes. This test was abbreviated due to testing difficulties; two (2) flux thimble tubes were previously capped and not accessible for testing. The eddy current probe was unable to be fully inserted in any tested flux thimble tube. The eddy current probe was able to be inserted beyond the area of expected wear on eight (8) flux thimble tubes providing useful data for these eight (8) flux

thimble tubes, seven (7) of which had indication of wear. The inability to obtain flux thimble tube full-length eddy current data was entered into the corrective action program. Due to the lack of new eddy current data, the flux thimble tubes were evaluated using previous data, conservative wear rate projections, and conservative acceptance criteria, as described in Exelon Response 2) below. As a result of this evaluation, five (5) flux thimble tubes were proactively replaced prior to plant startup. In addition, the two (2) flux thimble tubes that were previously capped and not accessible were replaced and returned to service prior to plant start-up. The projected wall loss at the next scheduled eddy current test for all remaining flux thimble tubes was determined to be 56 percent or less, therefore continued operation with these tubes in service was acceptable. The next performance of flux thimble tube eddy current testing is scheduled for the Fall 2015 outage.

Table 1 provides a summary of the results of flux thimble eddy current testing activites for Braidwood Station, Units 1 and 2, over the last three (3) scheduled tests.

Table 1

	Braidwood Unit 1			Braidwood Unit 2		
Eddy Current Test Date	Oct 2010	May 2012[1]	Sept 2013[2]	May 2011	Nov 2012[3]	May 2014[4]
Number of Flux Thimble Tubes	58	58	58	58	58	58
Accessible Flux Thimble Tubes (not capped)	58	58	58	58	58[5]	56
Flux Thimble Tubes Attempted to be Tested	58	16	22	58	28	39
Full-length Eddy Current Data Collected	58	16	0	57	26	0
Partial-length Eddy Current Data – restriction beyond area of expected wear[6]	0	0	0	0	1	8
Partial-length Eddy Current Data - restriction prior to area of expected wear[6]	0	0	22	1	1	31
Current number of flux thimble tubes with indications of wear			15			37
Highest percentage of projected wall loss until next test			51%			56%

Table 1 Notes:
1. Abbreviated test scope, 16 flux thimble tubes.
2. Abbreviated test scope due to test difficulties, 22 flux thimble tubes.
3. Abbreviated test scope due to test difficulties, 28 flux thimble tubes.
4. Abbreviated test scope due to test difficulties, 39 flux thimble tubes.
5. Flux timble tube capped during previous outage was replaced prior to eddy current testing in Nov 2012.
6. The area of expected wear includes locations associated with geometric discontinuities or area changes along the flow path (such as areas near the lower core plate, the core support forging, the upper tie plate, the lower tie plate, and the vessel penetration).

2) The Flux Thimble Tube Inspection aging management program has effectively managed flux thimble tube wear during the current licensing period using eddy current testing, engineering evaluations, and corrective actions such as isolating or replacing degraded flux thimble tubes or changing test frequency to ensure flux thimble tube integrity is maintained.

   The Flux Thimble Tube Inspection aging management program directs that if full length eddy current test data for each flux thimble tube is not obtained, further review is required. This review will determine additional actions that can include replacement, isolation (capping), or a conservative projection of wear based on historical test data justifying operation until the next scheduled eddy current test. The projections of wear for the missing data at Braidwood were performed using two (2) methods; a linear projection and the method described in WCAP-12866, "Bottom Mounted Instrumentation Flux Thimble Wear," which is an exponentially decreasing projection. The higher wear projection from these two (2) methods is then evaluated against a more conservative wall loss screening criteria (i.e., 50% wall loss, see Exelon Response 3) below) to determine if further action is required prior to the next scheduled eddy current test.

   For example, in May of 2014, at Braidwood Station, Unit 2, where flux thimble tube wear has historically occurred on more tubes, the following provides the justification for the adequacy of the program when flux thimble eddy current testing is not performed as planned. Due to a lack of eddy current data, an estimate of the wall loss for each flux thimble tube was determined using a linear projection (using worst-case cycle wear) and an exponential projection (WCAP-12866) based on historical test results. This identified 13 flux thimble tubes with a projected wall loss of greater than 50 percent at the end of the next cycle. The previous test results for these 13 flux thimble tubes were then further evaluated to determine if the wear had stabilized and was predictable or if the wear rate prediction was artificially high due to an anomalous test result. The resulting wear projection was then compared to the projected wall loss criteria of less than 80 percent through the next scheduled test. This resulted in the replacement of five (5) flux thimble tubes prior to plant start-up. Controls are in place to replace the remaining eight (8) flux thimble tubes if eddy current data is not collected during the next outage.

   The widespread inability to obtain flux thimble tube eddy current data occurred suddenly and involved flux thimble tubes of various in-service times. Moisture in the flux thimble tubes was cited as the issue by the eddy current technician during the failed attempts to collect eddy current data. Based on this, the issue is attributed to some common aspect, such as flux thimble tube cleaning or the eddy current testing process or equipment (e.g., ability to fully insert an eddy current probe).

   With regard to flux thimble tube cleaning, cleaning flux thimble tubes has been a common practice at Braidwood Station for many years due to the heavy use of neolube to lubricate the neutron detector drive cable during the early years of plant operation. It was discovered that neolube does not perform well in a high radiation field and causes blockage of the flux thimble tube preventing the

insertion of the neutron detector. The drive cables for replacement neutron detectors come from the factory with a neolube coating. The replacement neutron detector drive cables are cleaned prior to being installed. Additional applications of neolube is no longer routinely performed to lubricate the neutron detector drive cable and blockage of the neutron detector has not been major issue in recent years. A survey of the industry revealed that frequent cleaning of flux thimble tubes is not normally performed at most sites. In addition, the Braidwood bottom mounted instrument column assemblies, which are part of the reactor vessel internals, are unsleeved and contain geometric discontinuities and area changes which make the flux thimble tubes more susceptible to flow induced vibration resulting in high wear rates, short eddy current testing intervals, and subsequently more testing. Based on this industry operating experience and the current frequency of flux thimble tube eddy current testing at Braidwood (every cycle), the cleaning of the flux thimble tubes prior to eddy current testing may be introducing moisture or other contaminants into the flux thimble tube preventing the insertion of the eddy current probe. Therefore, one corrective action being considered is to eliminate or reduce the frequency of cleaning to eliminate the moisture which may be causing the restriction.

With regard to the eddy current testing process or equipment, eddy current testing uses a probe cable that is less rigid than the neutron detector drive cable or the dummy probe that is used to gauge the flux thimble tubes during the cleaning process. In addition, the small clearance between the eddy current probe and flux thimble tube in combination with moisture and a less rigid cable may be allowing the eddy current probe to become hydraulically locked preventing the full insertion of the eddy current probe. Therefore, the need to improve the eddy current probe physical characteristics (i.e., stiffer cable, smaller diameter) is also a corrective action to address these common aspects.

The corrective action program is addressing these common aspects as well as the short-term interim corrective actions taken during the outage (i.e., conservative wear projections to determine if any flux thimble tubes needed to be removed from service or replaced). In addition, a multi-discipline team, sponsored by station senior management, has been assigned to develop the necessary strategy and corrective actions to resolve this issue. The plan is to be implemented during the next Unit 1 outage in the Spring of 2015 and Unit 2 outage in the Fall of 2015. Corrective actions have been identified and are planned to be implemented to resolve the issues related to eddy current testing of flux thimble tubes to ensure that the component intended function will be maintained throughout the period of extended operation. Corrective actions being considered include the following; evaluate the need to clean flux thimble tubes prior to eddy current testing (suspected source of moisture), improved eddy current probe (stiffer cable, smaller diameter), mock-up training/demonstration ensuring an eddy current probe can be fully inserted in a new flux thimble tube, installation of larger diameter flux thimble tubes, and the controlled extraction of a restricted flux thimble tube for laboratory analysis. Implementation of these actions, as necessary, is expected to restore the ability to fully test the flux thimble tubes. However, compensatory measures implemented in accordance with the Flux Thimble Tube Inspection aging

management program, will also remain available to ensure that the flux thimble tubes will continue to perform their intended function for the current operating period and throughout the period of extended operation.

3) The Flux Thimble Tube Inspection aging management program assures that tube wear acceptance criteria are met and that the inspection program is adequate by imposing a low threshold for corrective action and an aggressive eddy current test frequency based on unit specific wear data. The program requires that corrective action (i.e., replacement, re-positioning, or isolation) be taken if wall loss greater than 60% is identified. The program also requires that action be taken if the wall loss is less than 60% but the projected wall loss prior to the next scheduled test exceeds 80%. Existing analysis has determined that a flux thimble tube is capable of performing its intended function with up to 85% wall loss. The frequency of eddy current testing is based on actual flux thimble tube wear data with the objective of ensuring that flux thimble tube integrity is maintained. The Flux Thimble Tube Inspection aging management program has effectively managed flux thimble tube wear during the current licensing period using eddy current testing, engineering evaluations, and corrective actions such as isolating or replacing degraded flux thimble tubes to ensure flux thimble integrity is maintained. Based on this information, the aging management program is managing, monitoring, and maintaining the system and components for this program. Corrective actions have been identified and are planned to be implemented to resolve the issues related to eddy current testing of flux thimble tubes to ensure that the intended function will be maintained throughout the period of extended operation, as described in Exelon Response 2) above.

4) Exelon has not had significant difficulty in completing eddy current examinations and obtaining data at Byron Station Units 1 and 2. The same basic flux thimble tube is used in all four (4) units (Byron 1 and 2, Braidwood 1 use 0.300 outside diameter (OD) tube, Braidwood 2 original tubes are 0.303 OD and uses 0.300 OD tubes for replacement). However, there is a difference in the vessel internals between the two (2) sites. The Byron Station, Units 1 and 2 vessel internals had anti-vibration instrumentation guide sleeves installed during initial construction, whereas Braidwood Station, Units 1 and 2 did not. The anti-vibration instrumentation guide sleeves eliminate some of the geometric discontinuities or area changes along the flux thimble insertion path which reduces the flow induced vibration and wear. Based on a review of flux thimble eddy current test results since 1999, no flux thimbles at Byron Station, Units 1 and 2 have required replacement due to wear.

   A review of the Byron Station, Unit 1 and 2 flux thimble tube eddy current tests performed since 1999 was conducted to identify any issues with being able to complete eddy current examinations or failure to obtain data on any of the tubes.

   A summary of the results of this review is provided in Table 2.

   Since 1999, there have been only seven (7) instances of not being able to insert the eddy current probe beyond the area of expected wear out of a total of 457 attempts for both units. Five (5) occurred on Byron Station, Unit 1; one (1) in

2003 and four (4) in 2008. Eddy current data covering the expected area of wear was able to be collected for all accessible flux thimble tubes during the latest performed test on Byron Station, Unit 1 in 2009. Two (2) instances occurred on Byron Station, Unit 2; one (1) in 2008 and one (1) in 2013. These were different flux thimble tubes. Eddy current data covering the expected area of wear was able to be collected for all accessible flux thimble tubes except for one (1) during the latest test on Byron Station, Unit 2 which was in 2013.

As can been from the discussion above, the recent widespread inability to insert an eddy current probe beyond the area of expected wear experienced at Braidwood Station, Units 1 and 2, has not been experienced at Bryon Station.

However, there have been two (2) instances at Byron Station, Unit 1 where eddy current testing was re-scheduled due to test equipment issues. The first instance was in 2008 where, although eddy current data was collected, poor signal quality due to noise issues during eddy current testing required the test to be re-scheduled for 2009. The second instance was in 2014, when the eddy current test equipment was set-up to perform eddy current testing and was damaged prior to commencing the test. Eddy current testing was re-scheduled to be performed during the next outage in 2015.

To summarize the above information, the ability to obtain flux thimble tube eddy current data at Byron Station has been significantly better than recent attempts at Braidwood Station.

In addition, as can be seen in Table 2, historically, Byron Station, Unit 1 and 2 flux thimble wear has been significantly less than the wear experienced at Braidwood Station, Unit 1 and 2. This observation is further supported by the fact that no flux thimble tubes have required replacement due to wear at Byron Station based on a review of flux thimble tube eddy current test results since 1999. Also, out of the 58 flux thimble tube locations per unit, nine (9) flux thimble tubes on Unit 1 and nine (9) flux thimble tubes on Unit 2 currently have indications of wear. Of these tubes, the highest percentage of wall loss on an individual tube was 24% wear on Unit 1 and 37% wear on Unit 2, and the eddy current test data trend on these two flux thimble tubes is stable and predictable.

Therefore as described above, Byron Station, Unit 1 and 2, does not have similar issues as described in the background section of this RAI, pertaining to Braidwood Station, Units 1 and 2.

As a result of the test documentation review performed in response to this RAI, an update to Byron Station operating experience example 2 in Appendix B of the LRA, describing the Byron Station, Unit 2, Fall 2008 flux thimble tube eddy current test, is provided revising the number of flux thimble tubes on which eddy current data was collected. Changes to LRA Appendix B, Section B.2.1.24, are included in Enclosure B.

Table 2

	Byron Unit 1[1]				Byron Unit 2			
Eddy Current Test Date	Mar 1999	Sept 2003	Apr 2008[2]	Sept 2009	Oct 1999	Mar 2004	Oct 2008	Apr 2013
Number of Flux Thimble Tubes	58	58	58	58	58	58	58	58
Accessible Flux Thimble Tubes (not capped)	57	56	56	56	58	58	58	58
Flux Thimble Tubes Attempted to be Tested	57	56	56	56	58	58	58	58
Full-length Eddy Current Data Collected	57	55	51	56	58	58	27	1
Partial-length Eddy Current Data – restriction beyond area of expected wear[4]	0	0	1	0	0	0	30	56
Partial-length Eddy Current Data - restriction prior to area of expected wear[4]	0	1	4	0	0	0	1[3]	1[3]
Current number of flux thimble tubes with indications of wear				9				9
Highest percentage of wall loss indicated in last test				24%				37%

Table 1 Notes:

1. Byron Unit 1 eddy current testing scheduled for the Spring of 2014 outage was deferred to the Fall of 2015 outage due to test equipment damage prior to commencing eddy current testing.
2. Eddy current data collected, however due to excessive noise, test was re-scheduled for Sept 2009 and completed.
3. Partial-length Eddy Current Data – restriction prior to area of expected wear in April 2013 was a different flux thimble tube location than in October 2008.
4. The area of expected wear includes locations associated with geometric discontinuities or area changes along the flow path (such as areas near the lower core plate, the core support forging, the upper tie plate, the lower tie plate, and the vessel penetration).

A records review indicates that there have been no cases in which higher than expected wear or under-predicting of wear has occurred on any of the flux thimble tubes at Byron Station, Units 1 and 2. Records since 1999 indicate that no flux thimble tubes were required to be removed from service or replaced due to wear. The two (2) flux thimble tubes removed from service on Byron Station, Unit 1 were removed due to an issue other than wear. Records also indicate that the frequency of eddy current testing has not been increased to account for an unexpected increased wear. The current frequency for flux thimble tube eddy current testing is every third refueling outage for both units.

5) There have been no leakage events at Byron and Braidwood Stations, Units 1 and 2, due to flux thimble tube wear.

Enclosure B

Byron and Braidwood Stations, Units 1 and 2

License Renewal Application Update resulting from the response to the following RAI:

RAI B.2.1.24-1a

Note: To facilitate understanding, portions of the original LRA have been repeated in this Enclosure, with revisions indicated. Existing LRA text is shown in normal font. Changes are highlighted with ***bolded italics*** for inserted text and ~~strikethroughs~~ for deleted text.

As a result of changes to the Reactor Vessel Surveillance aging management program identified in the response to B.2.1.24-1a, LRA Appendix B, Section B.2.1.24, Operating Experience, page B-154 is revised as shown below. Revisions are indicated with ***bolded italics*** for inserted text and ~~strikethroughs~~ for deleted text:

Byron Station

1. The most recent eddy current testing of the Byron Station, Unit 1 flux thimble tubes was performed during the Byron Station, Unit 1 Fall 2009 Refueling Outage. Byron Station, Unit 1 flux thimble tube inspections are performed on a three (3) refueling outage frequency. No flux thimble tubes exceeded the specified acceptance criteria and the highest recorded wall loss was 24 percent. Two (2) flux thimble tubes have been removed from service due to an issue other than wear (displaced anti-vibration sleeves). One (1) flux thimble tube was removed from service in 2002 and the other in 1991.

   This example provides objective evidence that the Flux Thimble Tube Inspection program implements examinations using the methods and examination frequency recommended in the appropriate PWR guidelines.

2. ~~The most recent e~~***E***ddy current testing of the Byron Station, Unit 2 flux thimble tubes was performed during the Byron Station, Unit 2 Fall 2008 Refueling Outage. Byron Station, Unit 2 flux thimble tube inspections are performed on a three (3) refueling outage frequency. Eddy current data for ***57***~~31~~ flux tubes was obtained and no flux thimble tubes exceeded the specified acceptance criteria as the highest recorded wall loss was 26 percent. ***Eddy current test data covering the expected area of wear was not collected for one (1) flux thimble tube. This original equipment flux thimble tube had no indications of recordable wear in previous tests and was maintained in service.***

   This example provides objective evidence that the Flux Thimble Tube Inspection program implements examinations using the methods and examination frequency recommended in the appropriate PWR guidelines.