

# Generic Assessment Expert Team: GAET EVALUATION

Log No. 14-00  
(Obtained from NEI)

This evaluation is applicable to: Draft Generic Letter 201X-XX, "Monitoring of Neutron  
(Activity/Document Number & Title) Absorbing Materials in Spent Fuel Pools" Rev. No. 0 Page 1 of 11.

**Summary:** (To be used in preparation of the transmittal to NEI Administrative Points of Contact at the plant sites.)

**Activity Description (proposed action and success criteria):**

The NRC is issuing a draft generic letter to address degradation of neutron-absorbing materials in the spent fuel pool (SFP). The NRC has determined that it is necessary to obtain plant-specific information requested in the draft generic letter so that the NRC can determine if the degradation of the neutron-absorbing materials in the SFP is being managed to maintain reasonable assurance that the materials are capable of performing their intended safety function, and to determine if the licensees are in compliance with the regulations.

The NRC requires the power reactor license holder to maintain SFP sub-criticality in accordance with 10 CFR 50.68, "Criticality Accident Requirements," and General Design Criterion (GDC) 62, "Prevention of Criticality in Fuel Storage and Handling," in Appendix A, "General Design Criteria for Nuclear Power Plants," of 10 CFR Part 50.

[Continued]

**Summary of Evaluation:**

Nuclear Safety Importance was assessed to be "Very Low," utilizing spent fuel criticality as a surrogate for core damage. This level of importance is applicable to plants with SFPs that are judged to have either "robust neutron absorbers" or "robust monitoring programs." Importance for Security, EP and RP were judged to be "None." Generically, the Reliability Importance is None. On a P-S basis, if the degradation and replacement schedule impact the ability to offload the core for refueling outages, then some Reliability Importance could be assigned.

The GAET summarized the 3 main characteristics for plant-specific consideration regarding the evaluation of safety importance as:

- Robustness of the absorber material
- Robustness of the monitoring program
- Existing level of defense in depth (e.g., PWR soluble boron of the order of 2000 ppm).

[Continued]

Members of GAET: Mike Tschiltz, NEI/PRA  Date: 6 / 30 / 14  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)  
Fred Smith, Entergy/SME Date: \_\_\_ / \_\_\_ / \_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)  
John Weglian, FirstEnergy/PRA Date: \_\_\_ / \_\_\_ / \_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)  
Kris Cummings, NEI/SME Date: \_\_\_ / \_\_\_ / \_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)  
Don Dube, ERIN Engineering/SA,PRA Date: \_\_\_ / \_\_\_ / \_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)  
Kevin Koski, FirstEnergy/SME Date: \_\_\_ / \_\_\_ / \_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)  
GAET Chair: Gerry Loignon, SCANA/O, E, SA, PRA Date: \_\_\_ / \_\_\_ / \_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)  
NEI Reviewer: Kati Austgen Date: \_\_\_ / \_\_\_ / \_\_\_  
(Print name) (Sign)

Has a copy of this completed and approved GAET Evaluation been provided to the Cumulative Impact  
Prioritization project manager (NEI)?

YES

# Generic Assessment Expert Team: GAET EVALUATION

Log No. 14-00  
(Obtained from NEI)

This evaluation is applicable to: Draft Generic Letter 201X-XX, "Monitoring of Neutron  
(Activity/Document Number & Title) Absorbing Materials in Spent Fuel Pools" Rev. No. 0 Page 1 of 11

**Summary:** (To be used in preparation of the transmittal to NEI Administrative Points of Contact at the plant sites.)

**Activity Description (proposed action and success criteria):**

The NRC is issuing a draft generic letter to address degradation of neutron-absorbing materials in the spent fuel pool (SFP). The NRC has determined that it is necessary to obtain plant-specific information requested in the draft generic letter so that the NRC can determine if the degradation of the neutron-absorbing materials in the SFP is being managed to maintain reasonable assurance that the materials are capable of performing their intended safety function, and to determine if the licensees are in compliance with the regulations.

The NRC requires the power reactor license holder to maintain SFP sub-criticality in accordance with 10 CFR 50.68, "Criticality Accident Requirements," and General Design Criterion (GDC) 62, "Prevention of Criticality in Fuel Storage and Handling," in Appendix A, "General Design Criteria for Nuclear Power Plants," of 10 CFR Part 50.

[Continued]

**Summary of Evaluation:**

Nuclear Safety Importance was assessed to be "Very Low," utilizing spent fuel criticality as a surrogate for core damage. This level of importance is applicable to plants with SFPs that are judged to have either "robust neutron absorbers" or "robust monitoring programs." Importance for Security, EP and RP were judged to be "None." Generically, the Reliability Importance is None. On a P-S basis, if the degradation and replacement schedule impact the ability to offload the core for refueling outages, then some Reliability Importance could be assigned.

The GAET summarized the 3 main characteristics for plant-specific consideration regarding the evaluation of safety importance as:

- Robustness of the absorber material
- Robustness of the monitoring program
- Existing level of defense in depth (e.g., PWR soluble boron of the order of 2000 ppm).

[Continued]

Members of GAET: Mike Tschiltz, NEI/PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Fred Smith, Entergy/SME Date: 7/15/14  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

John Weglian, FirstEnergy/PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Kris Cummings, NEI/SME Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Don Dube, ERIN Engineering/SA,PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Kevin Koski, FirstEnergy/SME Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

GAET Chair: Gerry Loignon, SCANA/O, E, SA, PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

NEI Reviewer: Kati Austgen Date: \_\_\_/\_\_\_/\_\_\_  
(Print name) (Sign)

Has a copy of this completed and approved GAET Evaluation been provided to the Cumulative Impact Prioritization project manager (NEI)?

YES

# Generic Assessment Expert Team: GAET EVALUATION

Log No. 14-00  
(Obtained from NEI)

This evaluation is applicable to: Draft Generic Letter 201X-XX, "Monitoring of Neutron  
(Activity/Document Number & Title) Absorbing Materials in Spent Fuel Pools" Rev. No. 0 Page 1 of 11

Summary: (To be used in preparation of the transmittal to NEI Administrative Points of Contact at the plant sites.)

Activity Description (proposed action and success criteria):

The NRC is issuing a draft generic letter to address degradation of neutron-absorbing materials in the spent fuel pool (SFP). The NRC has determined that it is necessary to obtain plant-specific information requested in the draft generic letter so that the NRC can determine if the degradation of the neutron-absorbing materials in the SFP is being managed to maintain reasonable assurance that the materials are capable of performing their intended safety function, and to determine if the licensees are in compliance with the regulations.

The NRC requires the power reactor license holder to maintain SFP sub-criticality in accordance with 10 CFR 50.68, "Criticality Accident Requirements," and General Design Criterion (GDC) 62, "Prevention of Criticality in Fuel Storage and Handling," in Appendix A, "General Design Criteria for Nuclear Power Plants," of 10 CFR Part 50.

[Continued]

Summary of Evaluation:

Nuclear Safety Importance was assessed to be "Very Low," utilizing spent fuel criticality as a surrogate for core damage. This level of importance is applicable to plants with SFPs that are judged to have either "robust neutron absorbers" or "robust monitoring programs." Importance for Security, EP and RP were judged to be "None." Generically, the Reliability Importance is None. On a P-S basis, if the degradation and replacement schedule impact the ability to offload the core for refueling outages, then some Reliability Importance could be assigned.

The GAET summarized the 3 main characteristics for plant-specific consideration regarding the evaluation of safety importance as:

- Robustness of the absorber material
- Robustness of the monitoring program
- Existing level of defense in depth (e.g., PWR soluble boron of the order of 2000 ppm).

[Continued]

Members of GAET: Mike Tschiltz, NEI/PRA Date:    /   /     
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Fred Smith, Entergy/SME Date:    /   /     
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

John Weglian, FirstEnergy/PRA *John E. Weglian* Date: 6/24/14  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Kris Cummings, NEI/SME Date:    /   /     
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Don Dube, ERIN Engineering/SA,PRA Date:    /   /     
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Kevin Koski, FirstEnergy/SME Date:    /   /     
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

GAET Chair: Gerry Loignon, SCANA/O, E, SA, PRA Date:    /   /     
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

NEI Reviewer: Kati Austgen Date:    /   /     
(Print name) (Sign)

Has a copy of this completed and approved GAET Evaluation been provided to the Cumulative Impact Prioritization project manager (NEI)?

YES

# Generic Assessment Expert Team: GAET EVALUATION

Log No. 14-00  
(Obtained from NEI)

This evaluation is applicable to: Draft Generic Letter 201X-XX, "Monitoring of Neutron  
(Activity/Document Number & Title) Absorbing Materials in Spent Fuel Pools" Rev. No. 0 Page 1 of 11

Summary: (To be used in preparation of the transmittal to NEI Administrative Points of Contact at the plant sites.)

Activity Description (proposed action and success criteria):

The NRC is issuing a draft generic letter to address degradation of neutron-absorbing materials in the spent fuel pool (SFP). The NRC has determined that it is necessary to obtain plant-specific information requested in the draft generic letter so that the NRC can determine if the degradation of the neutron-absorbing materials in the SFP is being managed to maintain reasonable assurance that the materials are capable of performing their intended safety function, and to determine if the licensees are in compliance with the regulations.

The NRC requires the power reactor license holder to maintain SFP sub-criticality in accordance with 10 CFR 50.68, "Criticality Accident Requirements," and General Design Criterion (GDC) 62, "Prevention of Criticality in Fuel Storage and Handling," in Appendix A, "General Design Criteria for Nuclear Power Plants," of 10 CFR Part 50.

[Continued]

Summary of Evaluation:

Nuclear Safety Importance was assessed to be "Very Low," utilizing spent fuel criticality as a surrogate for core damage. This level of importance is applicable to plants with SFPs that are judged to have either "robust neutron absorbers" or "robust monitoring programs." Importance for Security, EP and RP were judged to be "None." Generically, the Reliability Importance is None. On a P-S basis, if the degradation and replacement schedule impact the ability to offload the core for refueling outages, then some Reliability Importance could be assigned.

The GAET summarized the 3 main characteristics for plant-specific consideration regarding the evaluation of safety importance as:

- Robustness of the absorber material
- Robustness of the monitoring program
- Existing level of defense in depth (e.g., PWR soluble boron of the order of 2000 ppm).

[Continued]

Members of GAET: Mike Tschiltz, NEI/PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Fred Smith, Entergy/SME Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

John Weglian, FirstEnergy/PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Kris Cummings, NEI/SME *K. W. Cummings* Date: 7/1/14  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Don Dube, ERIN Engineering/SA,PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Kevin Koski, FirstEnergy/SME Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

GAET Chair: Gerry Loignon, SCANA/O, E, SA, PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

NEI Reviewer: Kati Austgen *Katherine R. Austgen* Date: 7/17/14  
(Print name) (Sign)

Has a copy of this completed and approved GAET Evaluation been provided to the Cumulative Impact  
Prioritization project manager (NEI)?

YES

# Generic Assessment Expert Team: GAET EVALUATION

Log No. 14-00  
(Obtained from NEI)

This evaluation is applicable to: Draft Generic Letter 201X-XX, "Monitoring of Neutron  
(Activity/Document Number & Title) Absorbing Materials in Spent Fuel Pools" Rev. No. 0 Page 1 of 11

Summary: (To be used in preparation of the transmittal to NEI Administrative Points of Contact at the plant sites.)

Activity Description (proposed action and success criteria):

The NRC is issuing a draft generic letter to address degradation of neutron-absorbing materials in the spent fuel pool (SFP). The NRC has determined that it is necessary to obtain plant-specific information requested in the draft generic letter so that the NRC can determine if the degradation of the neutron-absorbing materials in the SFP is being managed to maintain reasonable assurance that the materials are capable of performing their intended safety function, and to determine if the licensees are in compliance with the regulations.

The NRC requires the power reactor license holder to maintain SFP sub-criticality in accordance with 10 CFR 50.68, "Criticality Accident Requirements," and General Design Criterion (GDC) 62, "Prevention of Criticality in Fuel Storage and Handling," in Appendix A, "General Design Criteria for Nuclear Power Plants," of 10 CFR Part 50.

[Continued]

Summary of Evaluation:

Nuclear Safety Importance was assessed to be "Very Low," utilizing spent fuel criticality as a surrogate for core damage. This level of importance is applicable to plants with SFPs that are judged to have either "robust neutron absorbers" or "robust monitoring programs." Importance for Security, EP and RP were judged to be "None." Generically, the Reliability Importance is None. On a P-S basis, if the degradation and replacement schedule impact the ability to offload the core for refueling outages, then some Reliability Importance could be assigned.

The GAET summarized the 3 main characteristics for plant-specific consideration regarding the evaluation of safety importance as:

- Robustness of the absorber material
- Robustness of the monitoring program
- Existing level of defense in depth (e.g., PWR soluble boron of the order of 2000 ppm).

[Continued]

Members of GAET: Mike Tschiltz, NEI/PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Fred Smith, Entergy/SME Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

John Weglian, FirstEnergy/PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Kris Cummings, NEI/SME Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Don Dube, ERIN Engineering/SA,PRA *Don Dube* Date: 6/24/14  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Kevin Koski, FirstEnergy/SME Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

GAET Chair: Gerry Loignon, SCANA/O, E, SA, PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

NEI Reviewer: Kati Austgen Date: \_\_\_/\_\_\_/\_\_\_  
(Print name) (Sign)

Has a copy of this completed and approved GAET Evaluation been provided to the Cumulative Impact  
Prioritization project manager (NEI)?

YES

# Generic Assessment Expert Team: GAET EVALUATION

Log No. 14-00  
(Obtained from NEI)

This evaluation is applicable to: Draft Generic Letter 201X-XX, "Monitoring of Neutron  
(Activity/Document Number & Title) Absorbing Materials in Spent Fuel Pools" Rev. No. 0 Page 1 of 11

**Summary:** (To be used in preparation of the transmittal to NEI Administrative Points of Contact at the plant sites.)

**Activity Description (proposed action and success criteria):**

The NRC is issuing a draft generic letter to address degradation of neutron-absorbing materials in the spent fuel pool (SFP). The NRC has determined that it is necessary to obtain plant-specific information requested in the draft generic letter so that the NRC can determine if the degradation of the neutron-absorbing materials in the SFP is being managed to maintain reasonable assurance that the materials are capable of performing their intended safety function, and to determine if the licensees are in compliance with the regulations.

The NRC requires the power reactor license holder to maintain SFP sub-criticality in accordance with 10 CFR 50.68, "Criticality Accident Requirements," and General Design Criterion (GDC) 62, "Prevention of Criticality in Fuel Storage and Handling," in Appendix A, "General Design Criteria for Nuclear Power Plants," of 10 CFR Part 50.

[Continued]

**Summary of Evaluation:**

Nuclear Safety Importance was assessed to be "Very Low," utilizing spent fuel criticality as a surrogate for core damage. This level of importance is applicable to plants with SFPs that are judged to have either "robust neutron absorbers" or "robust monitoring programs." Importance for Security, EP and RP were judged to be "None." Generically, the Reliability Importance is None. On a P-S basis, if the degradation and replacement schedule impact the ability to offload the core for refueling outages, then some Reliability Importance could be assigned.

The GAET summarized the 3 main characteristics for plant-specific consideration regarding the evaluation of safety importance as:

- Robustness of the absorber material
- Robustness of the monitoring program
- Existing level of defense in depth (e.g., PWR soluble boron of the order of 2000 ppm).

[Continued]

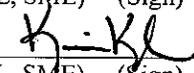
Members of GAET: Mike Tschiltz, NEI/PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Fred Smith, Entergy/SME Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

John Weglian, FirstEnergy/PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Kris Cummings, NEI/SME Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Don Dube, ERIN Engineering/SA,PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Kevin Koski, FirstEnergy/SME  Date: 6/24/14  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

GAET Chair: Gerry Loignon, SCANA/O, E, SA, PRA Date: \_\_\_/\_\_\_/\_\_\_  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

NEI Reviewer: Kati Austgen Date: \_\_\_/\_\_\_/\_\_\_  
(Print name) (Sign)

Has a copy of this completed and approved GAET Evaluation been provided to the Cumulative Impact Prioritization project manager (NEI)?

YES

# Generic Assessment Expert Team: GAET EVALUATION

Log No. 14-00  
(Obtained from NEI)

This evaluation is applicable to: Draft Generic Letter 201X-XX, "Monitoring of Neutron  
(Activity/Document Number & Title) Absorbing Materials in Spent Fuel Pools" Rev. No. 0 Page 1 of 11

Summary: (To be used in preparation of the transmittal to NEI Administrative Points of Contact at the plant sites.)

Activity Description (proposed action and success criteria):

The NRC is issuing a draft generic letter to address degradation of neutron-absorbing materials in the spent fuel pool (SFP). The NRC has determined that it is necessary to obtain plant-specific information requested in the draft generic letter so that the NRC can determine if the degradation of the neutron-absorbing materials in the SFP is being managed to maintain reasonable assurance that the materials are capable of performing their intended safety function, and to determine if the licensees are in compliance with the regulations.

The NRC requires the power reactor license holder to maintain SFP sub-criticality in accordance with 10 CFR 50.68, "Criticality Accident Requirements," and General Design Criterion (GDC) 62, "Prevention of Criticality in Fuel Storage and Handling," in Appendix A, "General Design Criteria for Nuclear Power Plants," of 10 CFR Part 50.

[Continued]

Summary of Evaluation:

Nuclear Safety Importance was assessed to be "Very Low," utilizing spent fuel criticality as a surrogate for core damage. This level of importance is applicable to plants with SFPs that are judged to have either "robust neutron absorbers" or "robust monitoring programs." Importance for Security, EP and RP were judged to be "None." Generically, the Reliability Importance is None. On a P-S basis, if the degradation and replacement schedule impact the ability to offload the core for refueling outages, then some Reliability Importance could be assigned.

The GAET summarized the 3 main characteristics for plant-specific consideration regarding the evaluation of safety importance as:

- Robustness of the absorber material
- Robustness of the monitoring program
- Existing level of defense in depth (e.g., PWR soluble boron of the order of 2000 ppm).

[Continued]

Members of GAET: Mike Tschiltz, NEI/PRA Date:    /   /     
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

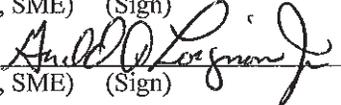
Fred Smith, Entergy/SME Date:    /   /     
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

John Weglian, FirstEnergy/PRA Date:    /   /     
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Kris Cummings, NEI/SME Date:    /   /     
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Don Dube, ERIN Engineering/SA,PRA Date:    /   /     
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

Kevin Koski, FirstEnergy/SME Date:    /   /     
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

GAET Chair: Gerry Loignon, SCANA/O, E, SA, PRA  Date: 7/15/2014  
(Print name/expertise: O, E, SA, PRA, L, SME) (Sign)

NEI Reviewer: Kati Austgen Date:    /   /     
(Print name) (Sign)

Has a copy of this completed and approved GAET Evaluation been provided to the Cumulative Impact Prioritization project manager (NEI)?  YES

# GAET EVALUATION (Continued)

Log No. 14-00

This evaluation applicable to Draft Generic Letter 201X-XX, "Monitoring of Neutron Absorbing Materials in Spent Fuel Pools" Rev. No. 0 Page 2 of 11

## NOTE

A separate written response providing the basis for the answer to each question below shall accompany this form. NEI 14-XX must be used to determine the content of each response.

Identify references used to perform the evaluation.

### References used by GAET:

NRC Generic Letter 201X-XX, "Monitoring of Neutron Absorbing Materials in Spent Fuel Pools," ML13100A086 Letter, Cummings, K. to Bladley, C., "Industry Comments on NRC Draft Generic Letter 201X-XX, Monitoring of Neutron Absorbing Materials in Spent Fuel Pools," May 12, 2014  
EPRI TR-1025204, "Strategy for Managing Long Term Use of BORAL in Spent Fuel Storage Pools," July 2012  
NEI 12-16, "Guidance for Performing Criticality Analyses of Fuel Storage at Light-Water Reactor Power Plants," Rev. 1, April 2014  
Presentation, NEI to NRC, "NEI 12-06, Guidance for Performing Criticality Analyses of Fuel Storage at Light-Water Reactor Power Plants," October 31, 2013, ML13308A015

### SAFETY IMPORTANCE CHARACTERIZATION (See Section 3.0 of NEI 14-XX.)

#### *Step 1 (Screening for any impact)*

Does the proposed activity or issue:

1. Result in an impact on the frequency of occurrence of a risk significant accident initiator?  YES  NO  
Cannot preclude an increase in SFP criticality event due to undetected neutron absorber degradation for a portion of reactor fleet. Plant-specific (P-S) factors to consider: robustness of design, robustness of monitoring program, and margin to criticality based on soluble boron concentration in spent fuel pool (PWRs).
2. Result in an impact on the availability, reliability, or capability of SSCs or personnel relied upon to mitigate a risk significant transient, accident, or natural hazard?  YES  NO  
There is no impact on the availability, reliability, or capability of either SSCs or personnel relied upon for mitigation of a SFP criticality event.
3. Result in an impact on the consequences of a risk significant accident sequence?  YES  NO  
Given a potential SFP criticality event, this issue does not impact the consequences of an accident.
4. Result in an impact on the capability of a fission product barrier?  YES  NO  
This issue does not impact the fuel cladding, reactor coolant system boundary, containment, or SFP building ventilation and filtration systems.
5. Result in an impact on defense-in-depth capability or impact in safety margin?  YES  NO  
The issue potentially impacts the margin to criticality in the SFP.

***If all questions are answered NO, then the issue or activity screens to no impact and the Nuclear Safety Importance is NONE. If ANY response is YES, continue to Step 2.***

#### *Step 2 (Screening for more than minimal impact)* N/A

Does the proposed activity or issue:

1. Result in more than a minimal decrease in frequency of occurrence of a risk significant accident initiator?  YES  NO  
The frequency of a SFP criticality event is not expected to be reduced if a plant has either a robust monitoring program or a robust neutron absorber that is not subject to significant degradation. On a P-S basis this could be YES for any plant with a combination of neutron absorber with higher potential for degradation (Boraflex or Carborundum/Tetrabor) and less robust monitoring program (no coupon monitoring or in-situ testing).
2. Result in more than a minimal improvement in the availability, reliability, or capability of SSCs or personnel relied upon to mitigate a risk significant transient, accident, or natural hazard?  YES  NO  
See Step 1.

## GAET EVALUATION (Continued)

Log No. 14-00

This evaluation applicable to Draft Generic Letter 201X-XX, "Monitoring of Neutron Absorbing Materials in Spent Fuel Pools" Rev. No. 0 Page 3 of 11

3. Result in more than a minimal decrease in the consequences of a risk significant accident sequence?  YES  NO  
See Step 1.
4. Result in more than a minimal improvement in the capability of a fission product barrier?  YES  NO  
See Step 1.
5. Result in more than a minimal improvement in defense-in-depth capability or impact in safety margin?  YES  NO  
For some materials there are no known or observed mechanism that would cause degradation, i.e., a loss of function. For these sites the P-S answer would be NO. For other sites the impact on margin is potentially above minimal dependent on their monitoring programs and design basis information.

***If ALL questions are answered NO, then the issue or activity screens to minimal impact and the Nuclear Safety Importance is VERY LOW. If ANY response is YES, continue to Step 3.***

***Step 3 (Determining high, medium, low or very low safety importance)***  N/A

Complete Step 3A and/or Step 3B. Step 3B can be used in lieu of Step 3A if appropriate quantitative information is readily available or can be developed.

***Step 3A (Qualitative approach)***  N/A

Use NEI 14-XX, Table 3-1, combined with the guidance for Step 2, to place proposed action into a safety importance category.

- What is the existing risk level (relative risk) associated with the issue? SFP criticality vs. CDF  CDF  LERF
- How much would the proposed activity reduce the relative risk?  None/0%  Very Small/Minimal/0 to 25%  
 Small/25 to 50%  Medium/50 to 90%  High/>90%
- The Nuclear Safety Importance is:  <Very Low  Very Low  Low  Medium  High  Reassess to identify an effective activity/action

***Step 3B (Quantitative approach)***  N/A

## GAET EVALUATION (Continued)

Log No. 14-00

This evaluation applicable to Draft Generic Letter 201X-XX, "Monitoring of Neutron Absorbing Materials in Spent Fuel Pools" Rev. No. 0 Page 4 of 11

Considerations and characteristics that may affect the plant-specific importance determination:

The GAET utilized Table 3-1, however, the CDF metric was replaced conservatively with "SFP criticality" as the metric for judging importance.

The GAET noted that in order for a criticality event to occur, a PWR SFP must have undetected degradation in combination with loss of the margin provided by the boron in the SFP water. A BWR SFP must have undetected degradation and this degradation must occur broadly across multiple fuel bundles in the SFP.

The GAET addressed the existing level of risk by dividing the population of SFPs into two categories. The first population includes plants with either "robust absorber" or a "robust monitoring program." Plants in this category will have a very low likelihood for a significant undetected degradation due to either the low chance for degradation (robust absorber) or high likelihood for early detection of degradation (robust monitoring program). For plants in this category, the Importance was judged to be Very Low.

Robust absorbers are considered to be Boral, Metamic, Borated Stainless Steel, Boralcan, or other metallic based neutron absorbers. Non-robust or susceptible materials are non-metallic, such as phenolic resin or polymeric based absorbers, with the trade name of Boraflex, Carborundum, and/or Tetrabor.

The second category addresses plants with non-robust neutron absorber materials with non-robust monitoring programs. The importance for this issue for this category of plants could range from Very Low (e.g., PWRs with 2000 ppm soluble boron in the SFP) to Medium or even unacceptably High in a worst case. It was noted in the discussion that there are no known plants in this category based on industry response to an NEI industry wide survey on neutron absorbers and neutron absorber monitoring programs, and through discussions at industry meetings such as the annual EPRI sponsored Neutron Absorber Users Group meetings.

While a definition of "Robust Absorber" was not established, the team believes that generally most commercially available materials, other than perhaps Boraflex, Carborundum, and/or Tetrabor, qualify. Monitoring as established in NEI 12-16, Revision 1 (Section 9.5) would generally qualify as "Robust Monitoring."

The GAET summarized the 3 main characteristics for plant-specific consideration regarding the evaluation of safety importance as:

- Robustness of the absorber material
- Robustness of the monitoring program
- Existing level of defense in depth (e.g., PWR soluble boron of the order of 2000 ppm).

# GAET EVALUATION (Continued)

Log No. 14-00

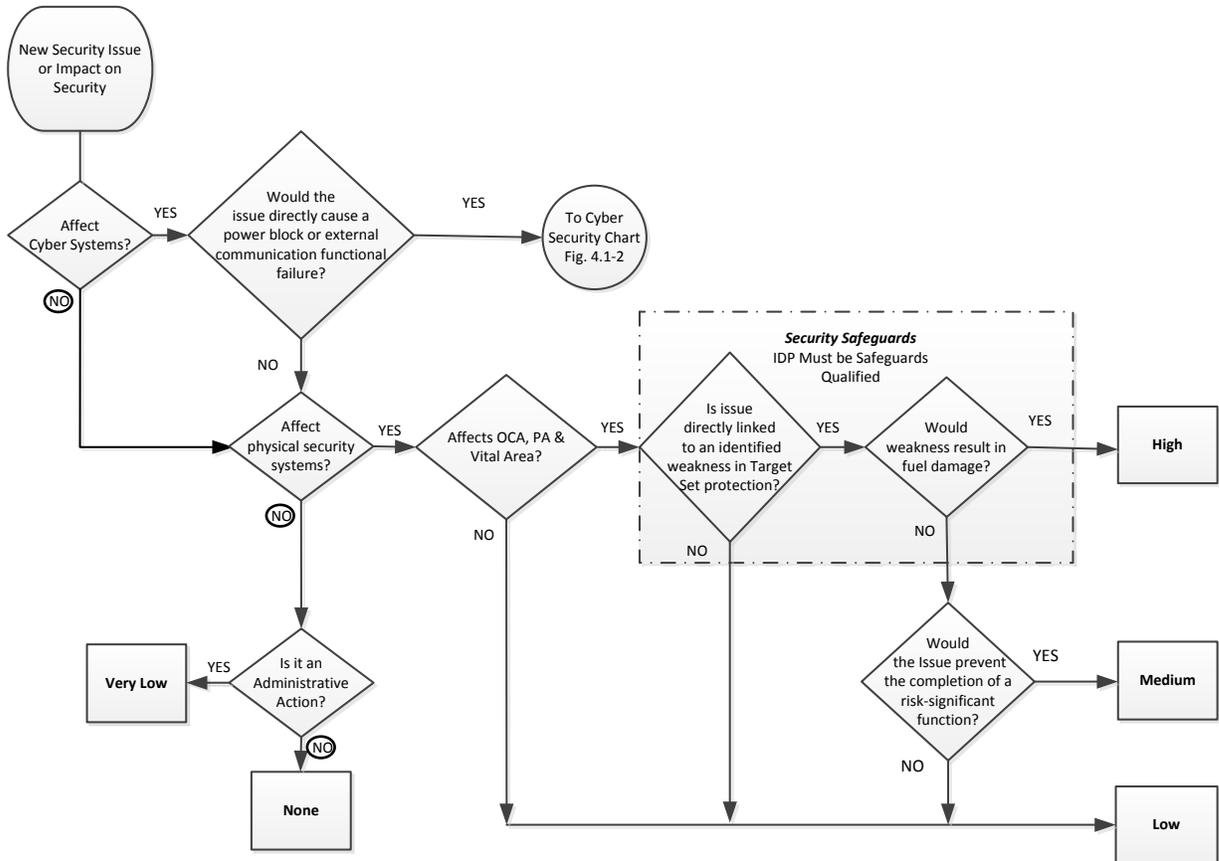
Draft Generic Letter 201X-XX, "Monitoring of  
 This evaluation applicable to Neutron Absorbing Materials in Spent Fuel Pools Rev. No. 0 Page 5 of 11

## SECURITY IMPORTANCE CHARACTERIZATION (See Section 4.1 of NEI 14-XX.)

### Step 1 (Screening for any impact)

Complete the flowchart in NEI 14-XX Figure 4.1-1 and, if appropriate, Figure 4.1-2 to determine the current significance associated with the issue.

**Figure 4.1-1  
 Security Issue Importance Determination – Step 1**



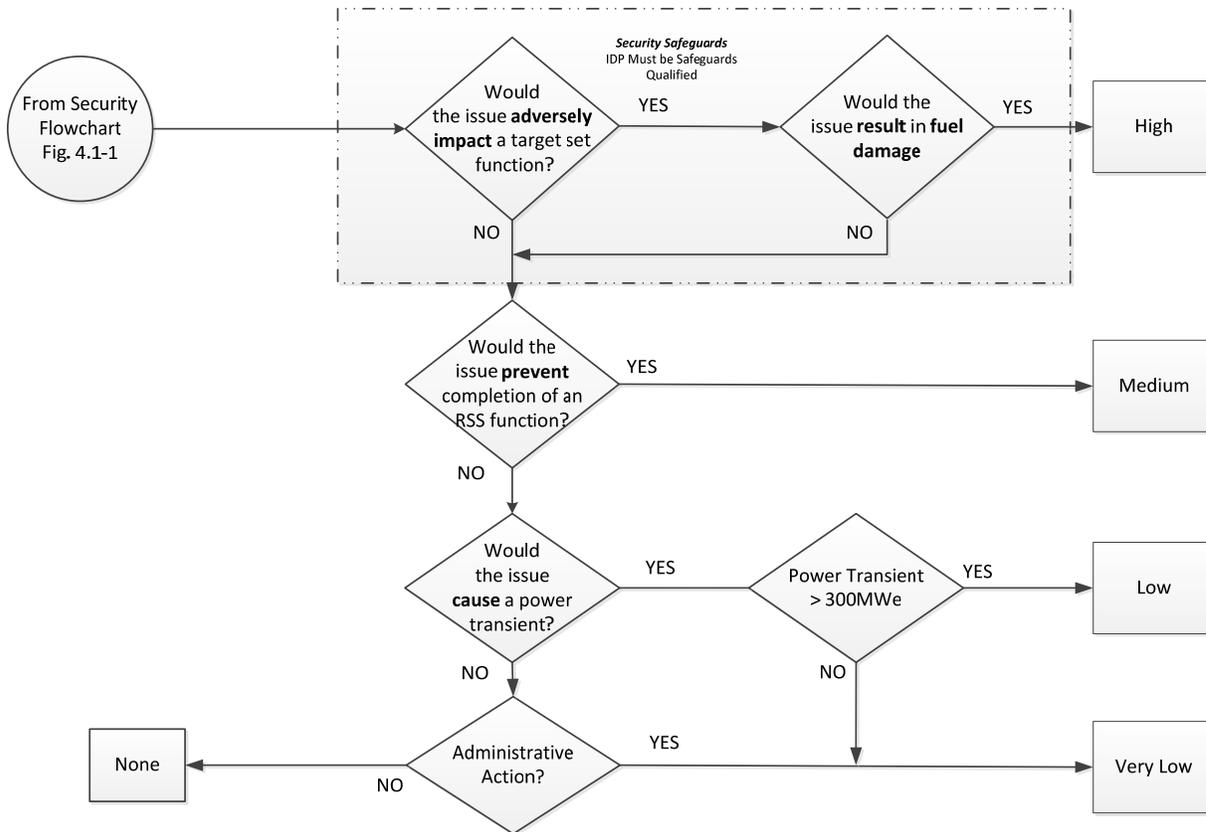
*NOTE: As used in this document the term issue may be a cyber-security intrusion, a potential cyber-security intrusion, or a security action or potential action*

# GAET EVALUATION (Continued)

Log No. 14-00

This evaluation applicable to Draft Generic Letter 201X-XX, "Monitoring of Neutron Absorbing Materials in Spent Fuel Pools" Rev. No. 0 Page 6 of 11

**Figure 4.1-2  
Cyber Security Importance Determination – Step 1**



NOTE: As used in this document the term issue may be a cyber-security intrusion or a potential cyber-security intrusion

***If the current significance associated with the issue is "None," then the Security Importance is NONE. If the current significance associated with the issue is anything other than "None," continue to Step 2.***

**Step 2 (Determining security importance)**  N/A

Use NEI 14-XX, Table 4-1, combined with the result for Step 1, to place proposed action into a security importance category.

- What is the current significance associated with the issue?     Very Low    Low    Medium    High
- How effective will the proposed activity be in resolving the issue?    Not Effective/0 to 25%  
     Somewhat Effective/25 to 80%  
     Mostly Effective/>80%
- The Security Importance is:    Very Low    Low    Medium    High    Reassess to identify an effective activity/action

# GAET EVALUATION (Continued)

Log No. 14-00

This evaluation applicable to Draft Generic Letter 201X-XX, "Monitoring of Neutron Absorbing Materials in Spent Fuel Pools" Rev. No. 0 Page 7 of 11

Considerations and characteristics that may affect the plant-specific importance determination:

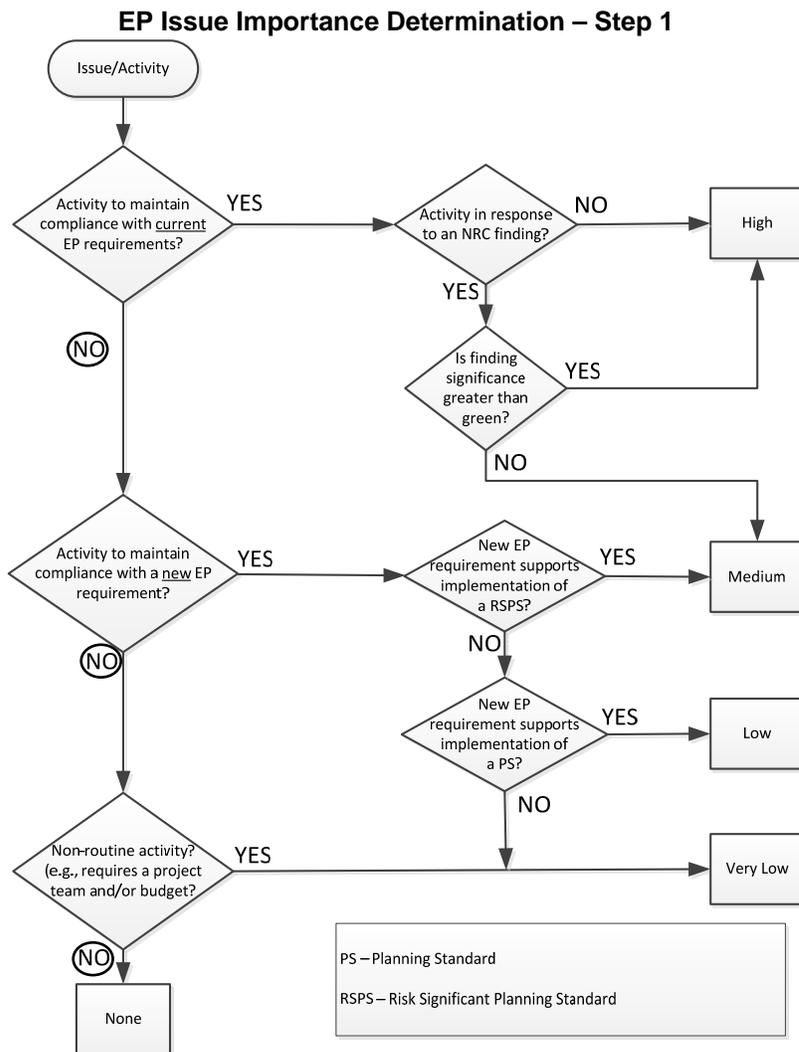
There is no impact on Security so the Security Importance is None.

## EMERGENCY PREPAREDNESS (EP) IMPORTANCE CHARACTERIZATION (See Section 4.2 of NEI 14-XX.)

### Step 1 (Screening for any impact)

If the issue has no nexus to EP, the EP importance is None. If the issue has any nexus to EP, complete the flowchart in NEI 14-XX Figure 4.2-1 to determine the current significance associated with the issue.

**Figure 4.2-1**



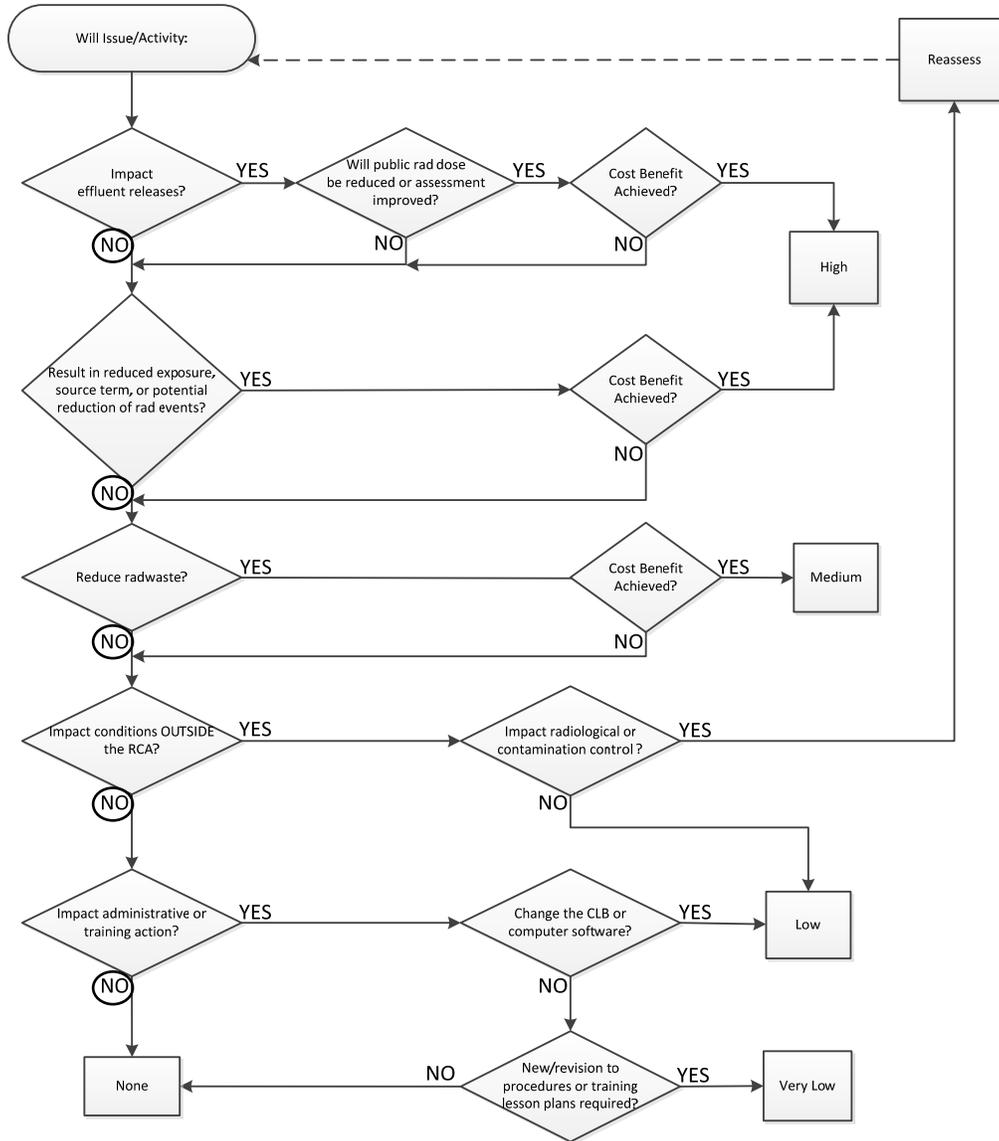
***If the current significance associated with the issue is "None," then the EP Importance is NONE. If the current significance associated with the issue is anything other than "None," continue to Step 2.***



# GAET EVALUATION (Continued)

**Figure 4.3-1**

## RP Issue Importance Determination – Step 1



***If the current significance associated with the issue is "None," then the RP Importance is NONE. If the current significance (benefit) associated with the issue is anything other than "None" or "Reassess," continue to Step 2.***

**Step 2 (Determining RP importance)  N/A**

Use NEI 14-XX, Table 4-1, combined with the result for Step 1, to place proposed action into an RP importance category.

- What is the current significance associated with the issue?     Very Low    Low    Medium    High
- How effective will the proposed activity be in resolving the issue?    Not Effective/0 to 25%  
     Somewhat Effective/25 to 80%  
     Mostly Effective/>80%
- The RP Importance is:    Very Low    Low    Medium    High    Reassess to identify an effective activity/action

# GAET EVALUATION (Continued)

Log No. 14-00

This evaluation applicable to Draft Generic Letter 201X-XX, "Monitoring of Neutron Absorbing Materials in Spent Fuel Pools" Rev. No. 0

Page 10 of 11

Considerations and characteristics that may affect the plant-specific importance determination:

The GAET noted that an increased monitoring program could result in an increase in Rad Waste due to increased use and disposal of coupons. The RP Importance is None.

## RELIABILITY IMPORTANCE CHARACTERIZATION (See Section 4.5 of NEI 14-XX.)

**Step 1 (Screening for any impact)**  N/A; entirely plant-specific for the proposed activity.

For the proposed activity or issue:

1. Is there a significant risk of system, structure, or component (SSC) failure?  
SFP neutron absorber failure is not imminent and will not cause a plant transient.  YES  NO
2. Is there a significant replacement lead time?  
Could be YES if there is indication of degradation and depending on the material (polymer or resin vs. metallic). This is true regardless of the introduction of a more robust monitoring program for earlier indication.  YES  NO
3. Is there an obsolescence issue?  
The issue does not involve obsolescence.  YES  NO
4. Is there an impact on plant reliability?  
The issue does not involve operation of the reactor.  YES  NO
5. Is there an impact on SSC or personnel availability due to frequency of preventive maintenance?  
The issue does not involve preventative maintenance unless a more robust monitoring program is proposed. (Which would not impact SSC availability due to the frequency of preventative maintenance. Likewise, it would not decrease the need for preventative maintenance or free personnel resources to address other maintenance needs.)  YES  NO

**If all questions are answered NO, then the issue or activity screens to no impact and the Reliability Importance is NONE. If ANY response is YES, continue to Step 2.**

**Step 2 (Determining reliability importance)**  N/A

Use NEI 14-XX, Table 4-2 to place proposed action into a reliability importance category.

- What is the timeframe for initial action (in operating cycles)?  Long ( $\geq 2$ )  Short ( $<2$ )
- Potential impact of activity on resolving the issue (duration of plant outage avoided)?  Day(s)  $\leq 13$  days  
 Week(s) 14 to 59 days  
 Month(s)  $\geq 60$  days
- The Reliability Importance is:  Very Low  Low  Medium  High

Considerations and characteristics that may affect the plant-specific importance determination:

Guidance for Step 2 does not fit this issue which has no impact on the operation of the reactor. If degradation is found and requires replacement, the work can be done while the plant is online. On a P-S basis, if the degradation and replacement schedule impact the ability to offload the core for refueling outages, then some Reliability Importance could be assigned. Generically, the Reliability Importance is None.

## GAET EVALUATION (Continued)

Log No. 14-00

This evaluation applicable to Draft Generic Letter 201X-XX, "Monitoring of Neutron Absorbing Materials in Spent Fuel Pools" Rev. No. 0

Page 11 of  
11

### Activity Description (continued):

The draft generic letter requests that each power reactor addressee provide the following information for use in verifying compliance:

- (1) a description of the neutron-absorbing material credited in the SFP nuclear criticality safety (NCS) analysis of record (AOR) and its configuration in the SFP
- (2) a description of the surveillance or monitoring program used to confirm that the neutron-absorbing material is performing its intended function, including the frequency, limitations, and accuracy of the methodologies used
- (3) a description of the technical basis for determining the interval of surveillance or monitoring for the neutron-absorbing material
- (4) a description of how the credited neutron-absorbing material is modeled in the SFP NCS AOR and how the monitoring or surveillance program ensures that the actual condition of the neutron-absorbing material is bounded by the NCS AOR
- (5) a description of the technical basis for concluding that the design basis for the neutron-absorbing material as an engineered safety feature in the spent fuel pool will be maintained during design-basis events

Appendix A to the draft generic letter provides details on the specific information that could be included in the responses to each item requested above.

In a May 12, 2014 comment letter on the draft GL, NEI stated that the industry does not agree that this topic warrants issuance of a generic letter at this time for the following three reasons:

1. The NRC has not established a safety concern sufficient to warrant a generic letter.
2. The proposed generic letter is too broad and would require the industry to unnecessarily expend significant resources.
3. The proposed generic letter is premature and should be reconsidered following NRC review of ongoing R&D in this area.