Revised Response to MCB Issue List
Regarding APR1400 FSAR Section 9.1.1 and 9.1.2

Issue #5 (AI 9-24.5)

In FSAR Section 9.1.2.2.2, on page 9.1-13, the applicant states:

"Neutron absorbing material is inserted between the fuel storage cell and the cover plate."

In technical report APR1400-Z-A-NR-14011, the "Reference Model" figure (e.g., Figure 3.4-1) do not contain a "cover plate." Is the "cover plate" in Chapter 9 also the "sheathe" in the technical report? If so, revise FSAR Chapter 9 to use consistent terminology for components.

Response - (Rev. 1)

FSAR 9.1.2.2.2 will be revised to "sheath" instead of "cover plate"

Impact on DCD

FSAR 9.1.2.2.2 will be revised as indicated on the attachment.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical, or Environmental Report.

A liner leakage collection system is provided to collect possible leakage from liner plate welds on the pool walls and floor. The stainless steel liners are welded to the C-shaped embedment in the pool walls, and the floors and embedment are interconnected and drain through the leakage collection pipe to a monitored collection point.

The SFP leakage collection pipes connected to the C-shaped embedment are closed by valves or caps in the collection points. Any leakage from liner plate welds is detected by opening the valves or caps during weekly patrols. To meet the requirements of 10 CFR 20.1406 (Reference 18), the inside of the leakage collection pipes is inspected using a device (e.g., fiberscope) approximately every refueling outage. If any materials (e.g., accumulated boric acid residue, minerals) are detected, the pipes are cleaned. The leakage collection pipes are sized to allow cleaning as specified in NRC RG 4.21 (Reference 19).

Spent Fuel Storage Racks

Spent fuel storage racks used for high-density storage are typically stainless steel structures with rectangular fuel storage cells coated with neutron absorbing material (see Figure 9.1.2-2).

Spent fuel storage rack modules are free standing on embedments in the pool floor. Sufficient space is provided between adjacent modules and between modules and other obstructions in the SFP to allow the modules to slide without contacting each other or other obstructions during a seismic event. The modules are equipped with stable, adjustable feet that rest on the embedments. The adjustable feet and lifting lugs permit the modules to be installed in the pool. The stainless steel used for the fabrication of the racks is compatible with fuel assembly materials and the spent fuel borated water environment.

Neutron absorbing material is used for reactivity control in spent fuel storage rack. Neutron absorbing material is inserted between the fuel storage cell and the ~~cover plate~~. Stainless steel plate for ~~cover plate~~ is welded to each side of the fuel storage cell with the neutron absorbing material installed in the ~~cover plate~~ cavity. The objective of ~~cover plate~~ design is to secure the neutron absorbing material to be installed safety. The ~~cover plate~~ serves to locate and position the neutron absorbing material accurately and to preclude its movement under seismic conditions. The ~~cover plate~~ also isolates the neutron absorbing material from the fuel. The neutron absorbing material covers the full length of the active fuel. Provisions are made for installing surveillance specimens of the neutron absorbing material

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Revised Response to MCB Issue List
Regarding APR1400 FSAR Section 9.1.1 and 9.1.2

Issue #8 (AI 9-24.8)

In FSAR Section 9.1.2.4, on page 9.1-18, the applicant states:

"The poison surveillance program is intended to monitor changes in physical and chemical properties of neutron absorbing material by performing the following measurements on a pre-planned schedule:

a. Visual observation and photography

b. Neutron attenuation

c. Dimensional measurements (length, width, and thickness)

d. Weight and specific gravity"

There are no acceptance criteria specified. Revise FSAR Section 9.1.2.4 to provide acceptance criteria for the neutron absorber surveillance program.

Response - (Rev. 1)

FSAR 9.1.2.4 will be revised to provide acceptance criteria for the neutron absorbing material (Metamic) surveillance program.

Impact on DCD

FSAR 9.1.2.4 will be revised as indicated on the attachment.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical, or Environmental Report.

The recommended schedule for coupon monitoring is to remove and examine one coupon at approximately 1.5, 3, 4.5, 6, 7.5, 9, 10.5, 12, 18, 22.5, 27, 31.5, 36, and 39 years from the time the SFP is permanently filled with water, as described in Table 9.1.2-2. Coupons are measured and visually examined to monitor changes in the physical properties of the neutron absorbing material (METAMIC^{TM}). B-10 areal density is also measured. Coupons that are not destroyed may be returned to the pool for continued use in the surveillance program.

The poison surveillance program is intended to monitor changes in physical and chemical properties of neutron absorbing material by performing the following measurements on a pre-planned schedule:

a. Visual observation and photography

b. Neutron attenuation

c. Dimensional measurements (length, width, and thickness)

d. Weight and specific gravity

[Insert]
"Of the measurements to be performed on the neutron absorbing material surveillance coupons, the most important are (1) the neutron attenuation measurements (to verify the continued presence of the boron) and (2) the thickness measurement (as a monitor of potential swelling). Acceptance criteria for these measurements are as follows:
- A decrease of no more than 5% in Boron−10 content, as determined by neutron attenuation, is acceptable. This is tantamount to a requirement for no loss in boron within the accuracy of the measurement.
- An increase in thickness at any point should not exceed 25% of the initial thickness at that point.
Changes in excess of either of these two criteria requires investigation and engineering evaluation which may include early retrieval and measurement of one or more of the remaining coupons to provide corroborative evidence that the indicated change(s) is real. If the deviation is determined to be real, an engineering evaluation shall be performed to identify further testing or any corrective action that may be necessary.
The remaining measurement parameters serve a supporting role and should be examined for early indications of the potential onset of neutron absorbing material degradation, if any, that would suggest a need for further attention and possibly a change in measurement schedule.
These include (1) visual or photographic evidence of unusual surface pitting, corrosion or edge deterioration, or (2) unaccountable weight loss in excess of the measurement accuracy."