Oconee Nuclear Station, Units 1, 2, and 3,
Subsequent License Renewal Application (SLRA)

TRP 017: Flow-Accelerated Corrosion (FAC)
Breakout Audit Questions Follow-up

New Breakout Question RE: Erosion Susceptibility Analysis

The "detection of aging effects" program element of GALL-SLR Report XI.M17 states, "For erosion mechanisms, the program includes the identification of susceptible locations based on the extent-of-condition reviews from corrective actions in response to plant-specific and industry OE."

Section 6.2.1 of EPRI 3002005530 states, "The first evaluation task in the plant erosion program is to identify all piping systems, or portions of systems, that could be susceptible to attack. This information should be documented in the Susceptibility Analysis." It goes on to state, "Erosive attack is known to occur in piping systems containing flowing water and wet steam. All such systems should be considered susceptible to erosion."

Section 4.4 of the FAC program evaluation report states, "An erosion susceptibility analysis has been performed to identify locations within susceptible systems where the potential for erosion damage may exist." It goes on to state that the analysis was performed in accordance with EPRI 1011231 and EPRI 3002005530.

Section 4 of the Oconee Unit 1 Erosion Susceptibility Analysis states, "The scope of the Erosion Susceptibility Analysis is all plant piping within the Unit 1 FAC Susceptible Systems."

Section 4.5 of the FAC program evaluation report states, "The erosion susceptibility analysis is periodically updated to ensure that identified locations susceptible to erosion mechanisms remain valid and incorporates inspection results and operating conditions, including infrequent operational alignments."

SLRA Table 3.2.2-3 for the High Pressure Injection System includes AMR item 3.2.1-065 for managing erosion of the stainless steel piping and piping components exposed internally to treated borated water. However, the Erosion Susceptibility Analysis does not appear to address the High Pressure Injection System. In addition, AR01788433 discusses erosion in valve 2HP-31 and states, "The erosion was not serious enough to justify replacing the valve body during 2EOC24 but is serious enough to justify replacing the valve body during the next Unit 2 outage."

For AMR item 3.3.1-126, Table 3.3.1 states, "Not applicable. Wall thinning due to erosion has not been identified as an applicable aging effect in ONS metallic piping, piping components exposed to treated water, treated borated water, or raw water in the scope of SLR in auxiliary systems." However, AR02301299, AR02301287, and AR01861642 discuss UT thickness data for various Erosion/Corrosion inspection points in the Low Pressure Service Water System. The NRC staff notes that the Low Pressure Service Water System is not included in the Erosion Susceptibility Analysis.

The NRC staff noted that several boundary drawings in the Oconee Unit 1 Erosion Susceptibility Analysis include a note that states, "CCW was beyond the scope of the Erosion Analysis for FAC Susceptible Systems." The staff also noted that AR01803293 and AR02251348 appear to be related to erosion of CCW piping and components. The SLRA does not appear to identify

the CCW as a FAC and/or erosion susceptible system. The staff notes, in response to Breakout Question #5, Raw Water (Internal) was not identified as an environment that FAC and/or erosion can occur. Also, see above regarding AMR item 3.3.1-126.

It is unclear to the staff that the Erosion Susceptibility Analysis considers non-FAC systems that have potential for erosion damage. Please confirm that the Erosion Susceptibility Analysis includes all locations that have potential for erosion damage, including non-FAC systems. Please discuss why the High Pressure Injection System is not addressed in the Erosion Susceptibility Analysis. Please discuss why the Low Pressure Service Water System does not include AMR items for managing FAC and/or erosion of the steel and stainless steel piping and piping components, and why the system is not addressed in the Erosion Susceptibility Analysis. In addition, please discuss whether the CCW is susceptible to FAC and/or erosion.

Breakout Question #3

During the breakout session, the NRC staff sought clarification on whether validation and verification (V&V) and error notification are included for each of the software products used.

With regards to error notification, the applicant stated in the response to Breakout Question #3 that "Error notification is documented in the SQA assignments once testing is completed. No errors were found for either software product in the most recent SQA assignments." The applicant also stated that Section 5.11 of AD-IT-ALL-0002 addresses error management in the SQA process. While the response to Breakout Question #3 does not explicitly state that it will continue for the FAC software through the SPEO, the NRC staff's understanding is that error notification will continue through the SPEO. Please confirm the staff's understanding.

AD-IT-ALL-0002 defines Software Error Management as "The reporting, tracking, notification, evaluation, and resolution of validated software errors." Software Users and SQA Action Request Assignee or NIT Analyst are identified as having error management responsibilities. Section 5.11 states that all users are to notify the Enterprise Help Desk to report software problems for evaluation by IT. It also states that for SQA Levels C, D, and E that "…Corrective Action Program may be used [emphasis added] to document a software problem/error for production software or computer systems," which would require a Nuclear Condition Report and an SQA Action Request to correct the software. Please discuss whether the typical practice is to use the Corrective Action Program to document a software problem/error, regardless of SQA Level.