DiabloCanyonNPEm Resource

From: Green, Kimberly
Sent: Monday, May 17, 2010 5:33 PM
To: Soenen, Philippe R; Grebel, Terence
Cc: DiabloHearingFile Resource
Subject: Draft RAI Set 3 - AMP Audit RAIs Part 1
Attachments: Draft RAI Set 3 AMP Audit RAIs Part 1.doc

Terry and Philippe,

Attached is Set 3 containing draft RAIs, specifically on some of the aging management programs (AMPs) reviewed during the AMP audit. Please review the attached draft RAIs and let me know if and when you would like to have a teleconference call. The purpose of the call will be to obtain clarification on the staff's request.

Please let me know if you have any questions.

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Diablo Canyon Nuclear Power Plant, Units 1 and 2 (DCPP)
License Renewal Application (LRA)
Draft Request for Additional Information Set 3
Aging Management Programs

D-RAI B2.1.1-1

Generic Aging Lessons Learned (GALL) Report AMP XI.M1 "scope of program" element contains broad class of components for inservice inspection (ISI) with respective standards for flaw acceptance and flaw evaluation. Also, the "detection of aging effects" program element covers the inspections of Class 1 small-bore piping and socket welds.

In its description of the ISI program under LRA Section B2.1.1, the applicant stated that DCPP evaluates every indication. However, the acceptance standards IWD-3400 and IWD-3500 and the flaw evaluation standard IWD-3600, for Class 3 components, are not included in the "program description" of LRA AMP B2.1.1. Also, Class 1 small-bore piping and socket welds for the aging management program are covered under different AMPs for DCPP.

Explain how the "program description" includes the use of acceptance and evaluation standards for Class 3 components. Also, indicate under the "detection of aging effects" element in which AMPs the inspection of Class 1 small-bore piping and socket welds are covered or supplemented.

D-RAI B2.1.1-2

In its "operating experience" summary the applicant noted an instance of intergranular stress corrosion cracking in an accumulator nozzle, identified in 1987, stating that all nozzles were inspected and those with unacceptable indications were subsequently weld-repaired or replaced with nozzles made of a new material. Also, in its evaluation of operating experience the applicant indicated that a long-term inspection plan is followed with visual examination of all nozzles and underskirt piping at normal operating pressure, and ultrasonic testing (UT) of those nozzles and underskirt piping which were not replaced.

The nozzle cracking was not identified as part of the inspections performed under the ASME Section XI ISI program. It is not clear why the UT is not performed on the replacement nozzles as part of the long-term plan, while it is performed on the non-replaced nozzles.

Provide justification for why only a visual inspection is performed on the replaced nozzles and underskirt piping, and not UT, as part of the long-term inspection plan for aging management.

D-RAI B2.1.3-1

In LRA Section B2.1.3 and a program exception to the GALL Report, the applicant stated, "[t]he future 120-month inspection interval for DCPP will incorporate the then-current requirements specified in the version of the ASME Code incorporated into 10 CFR 50.55a twelve months before the start of the inspection interval." Also, LRA Appendix A, Section A1.3 states, "DCPP is required to update its Section XI ISI program and use the ASME Code Edition consistent with the provisions of 10 CFR 50.55a during the period of extended operation."

The staff determines the acceptability of the newly proposed ASME Code Section XI editions for license renewal in the Statements of Consideration (SOC). The SOC are issued on the update of the 10 CFR 50.55a rule and published in the *Federal Register*. It is not evident to the staff whether the applicant's statement refers to the SOC associated with the update of 10 CFR 50.55a in order to justify the applicant's use of a more recent edition of the ASME Code Section XI when the plant enters the period of extended operation.

Clarify whether the statement quoted above means that for the future 120-month ISI intervals, which will be implemented during the period of extended operation, the applicant will incorporate the editions and addenda of the ASME Code that will be endorsed for use in 10 CFR 50.55a (as modified and subject to any limitations in rule) and be acceptable for the license renewal as referenced in the SOC on the update of 10 CFR 50.55a and published in the *Federal Register*.

D- RAI B2.1.3-2

During the audit of the Reactor Head Closure Studs Program (LRA Section B2.1.3), the applicant identified an exception to the "scope of program" program element. The applicant stated that the tensile strength of four heats of the material used in fabricating the studs exceeded the maximum tensile strength limit of 1172 MPa (170 ksi) specified in Regulatory Guide (RG) 1.65, "Material and Inspection for Reactor Vessel Closure Studs," October 1973. The applicant also stated that only heat and charge numbers are marked on the studs, and because there is a significant variation in tensile properties within a Heat and Charge of the material, it is unlikely that DCPP will be able to identify which stud from a given heat has tensile strength greater than 1172 MPa (170 ksi).

In addition to the tensile strength exceeding 1172 MPa, the yield strength of these heats of material exceeded 1034 MPa (150 ksi). For some materials, the yield strength was as high as 1138 MPa (165 ksi). When tempered to a tensile strength level above 1172 MPa, the high strength low-alloy steel for the studs becomes increasingly susceptible to stress corrosion cracking. In NUREG-1339, "Resolution of Generic Safety Issue 29: Bolting Degradation or Failure in Nuclear Power Plants," June, 1990, NRC established a position that the yield strength of high-strength bolts should not exceed 1034 MPa (150 ksi).

(a) Revise the LRA to include the newly identified exception to GALL "scope of program" program element that identifies that the tensile strength of four of the heats used in fabricating the studs exceeded the maximum tensile strength limit of 1172 MPa (170 ksi) specified in Regulatory Guide (RG) 1.65, "Material and Inspection for Reactor Vessel Closure Studs," October 1973.

(b) In view of the greater susceptibility of some of the studs to stress corrosion cracking (SCC), describe any preventive actions taken or planned to avoid the exposure of the studs to the environmental conditions that can lead to SCC, and describe possible changes/modifications in the program for managing cracking due to stress corrosion cracking for reactor head closure studs.

D-RAI B2.1.8-1

In LRA Section B2.1.8, the applicant stated that the "tubing and secondary internals in the

replacement steam generators are not susceptible to corrosion due to advanced material design."

Thermally treated Alloy 690 may be susceptible to corrosion as demonstrated in laboratory tests, but are more resistant than Alloy 600 mill annealed which was previously used in the DCPP steam generators. Please clarify the statement in the LRA regarding the corrosion susceptibility of the Alloy 690 material in the replacement steam generators.

D-RAI B2.1.10-1

10 CFR Part 54.4(a) provides the regulations for which plant systems, structures, and components are within the scope of the license renewal. These include items under 10 CFR 54.4(a)(2), which are all nonsafety-related systems, structures, and components whose failure could prevent satisfactory accomplishment of any of the functions identified in safety-related systems. The "parameters monitored or inspected" program element of the Closed-Cycle Cooling Water Aging Management Program in the GALL Report, Section XI.M21, indicates that the program includes monitoring the effects of corrosion and stress corrosion cracking by testing and inspection in accordance with the guidance in the EPRI report closed cooling water chemistry guideline as well as performance testing for pumps and heat exchangers.

LRA, Appendix B, Section B2.1.10 indicates that the applicant's Closed-Cycle Cooling Water Program will be consistent with the GALL Report Section XI.M21 with various exceptions. In both the LRA B2.1.10 program description and the applicant's basis document, the applicant indicated that the program will not conduct inspections or performance testing for components in scope of license renewal under criterion of 10 CFR 54.4(a)(2). It is not clear to the staff what the technical basis is for limiting the prescribed guidance in the GALL Report based on how a component was scoped into the license renewal process.

Provide justification for not performing the program's inspections and performance testing on components within the scope of license renewal under criterion 10 CFR 54.4(a)(2).

D-RAI B2.1.10-2

The Closed-Cycle Cooling Water System Aging Management Program in the GALL Report, Section XI.M21, includes non-chemistry monitoring parameters including pump and heat exchanger performance monitoring.

LRA, Appendix A, Section A1.10 indicates that the Closed-Cycle Cooling Water System Program will include maintenance of system chemistry parameters, but does not mention any non-chemistry monitoring parameters.

Update the FSAR supplement to be consistent with LRA Section B2.1.10 program description, including monitoring of non-chemistry parameters or provide justification for not including the monitoring of these parameters.

D-RAI B2.1.17-1

Program element “parameters monitored or inspected” of GALL Report Program XI.M33, “Selective Leaching of Materials” states:

> The visual inspection and hardness measurement is to be a one-time inspection. Because selective leaching is a slow acting corrosion process, this measurement is performed just before the beginning of the license renewal period. Follow-up of unacceptable inspection findings includes expansion of the inspection sample size and location.

In the LRA, the applicant describes its Selective Leaching of Materials Program in Appendix B2.1.17 as consistent with the GALL Report, with no exceptions or enhancements. The program descriptions provided in the LRA and the FSAR Supplement (A.1.17) state that the detection of selective leaching will result in the performance of an engineering evaluation, which will then determine the need for an expansion of inspection sample sizes and locations. It is unclear if an engineering evaluation will result in an expansion of inspection sample sizes and locations, consistent with the GALL Report.

Clarify if the Selective Leaching of Materials Program will expand the inspection sample size and location if selective leaching is detected. Provide justification if no expansion of sample size and location is to occur if selective leaching is detected.

D-RAI B2.1.36-1

The applicant proposed to credit the Metal Enclosed Bus program for inspecting the in-scope iso-phase bus. The iso-phase bus provides the Station Blackout (SBO) delay access offsite power source through back feeding the unit transformers and is included in the scope of the Metal Enclosed Bus Program. However, the inspection aspects of the iso-phase bus are different from those of the non-segregated bus. For example, the iso-phase bus does not have bus insulation, but has a bare conductor tube with no insulation material. Therefore, the bus insulation inspection as describe in the Metal Enclosed Bus Program is not applicable.

The GALL Report XI.E4 program is written specifically for managing non-segregated buses. The program attributes including parameters monitored or inspected, detection of aging effects, and acceptance criteria for non-segregated buses may not be appropriate for the iso-phase bus.

Explain how the inspections of non-segregated bus as described in the Metal Enclosed Bus Program are appropriate for the iso-phase bus.