April 2, 2003

LICENSEE: Rochester Gas and Electric Corporation (RG&E)

FACILITY: R. E. Ginna Nuclear Power Station

SUBJECT: SUMMARY OF MEETINGS BETWEEN THE NRC AND THE ROCHESTER GAS AND ELECTRIC CORPORATION CONCERNING DRAFT REQUESTS FOR ADDITIONAL INFORMATION PERTAINING TO THE GINNA NUCLEAR POWER PLANT, LICENSE RENEWAL APPLICATION

The U.S. Nuclear Regulatory Commission staff (the staff) and representatives of RG&E (or the applicant) held meetings on February 3 and 4, 2003, to discuss and clarify the staff's draft requests for additional information (D-RAI) concerning the Ginna License Renewal Application.

The meetings were useful in clarifying the intent of the staff's D-RAIs. Several of these D-RAIs were resolved, while the balance will formally be sent to the applicant. The resolution of D-RAIs was based on information available in the license renewal application or in other docketed material.

Enclosure 1 provides a list of the meeting participants. Enclosure 2 contains a listing of the D-RAIs discussed with the applicant, including a brief description on the status of the items. Enclosure 3 documents the basis for resolving or disposing of the D-RAIs that will not be issued as final RAIs (F-RAI) to the applicant. Enclosure 4 contains a matrix cross referencing the D-RAI with the F-RAI.

The applicant has had an opportunity to review and comment on this summary.

/RA/

Russell Arrighi, Project Manager
License Renewal Section
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No.: 50-244

Enclosures: As stated

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February 3 and 4, 2003

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Stu Bailey	NRC
Peter Balmain	NRC
Barry Elliot	NRC
John Fair	NRC
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Enclosure 1

MEETING WITH ROCHESTER GAS AND ELECTRIC CORPORATION (RG&E)
R.E. GINNA
LICENSE RENEWAL APPLICATION
DRAFT REQUESTS FOR ADDITIONAL INFORMATION

FEBRUARY 3 AND 4, 2003

During the February 3 and 4, 2003, meetings with representatives of RG&E, the NRC staff (the staff) discussed draft requests for additional information (D-RAIs) it had prepared for the R. E. Ginna (Ginna) license renewal application (LRA). The following D-RAIs were discussed during the meeting.

D-RAI 2.1 -1

Based on a review of the LRA and scoping and screening implementation procedures, the structures, system and components (SSC) functions identified in the applicant's safety classification program were used to provide preliminary scoping results. The staff has reviewed the safety classification rules contained in procedure IP-QAP-1 and requires additional information to determine how the safety classification rules were specifically applied to preliminarily identify in-scope SSCs. For example, Section 2.1.5.3 of the LRA implies that non-safety SSCs credited for internal missiles were identified using the safety classification rules; however, it was not clear which safety classification rule contained in IP-QAP-1 would apply to this equipment. Please provide a mapping of the safety classification program rules as applied to the 10 CFR 54(a)(1), (2), and (3) license renewal (LR) scoping criteria. This information will expedite the staff's review of the license renewal scoping methodology.

Response: RG&E indicated that the question is clear.

D-RAI 2.1 -2

10 CFR 54(a)(1)(iii) requires, in part, that the applicant consider within the scope of LR those SSC that ensure the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in §50.34(a)(1), §50.67(b)(2), or §100.11. Although the wording in Section 2.1.2, "Plant Level Scoping," of the LRA is consistent with this requirement, the scoping criteria definition documented in Section 3.2.1 of engineering procedure EP-3-S-0713, Revision 1, differs from the wording in 10 CFR 54(a)(1)(iii). Specifically, the EP-3-S-0713 safety-related scoping definition does not refer to offsite exposures comparable to those referred to in §50.34(a)(1) and §50.67(b)(2). Since the scoping implementation procedure does not directly refer to the offsite exposures limitations contained in §50.34(a)(1) and §50.67(b)(2), as applicable, how were these exposure limitations factored into the LR scoping and screening process.

Response: RG&E indicated that the question is clear.

D-RAI 2.1 -3

10 CFR 54.21(a) requires, in part, that the applicant identify and list those structures and components (SCs) subject to an aging management review (AMR). The staff's review of Section 2.1.7.4, "Electrical and I&C Systems," of the LRA indicates that only the commodity

group that represents the limiting aging characteristic within a plant area receives an AMR. Based on the information presented in the LRA, the staff questioned if this methodology could result in the failure to subject in-scope commodity groups, that are not the most age limited, to an AMR. Provide additional information regarding the screening methodology treatment of electrical and I&C system commodity groups to demonstrate that all in-scope commodity groups are subject to an AMR.

Response: RG&E indicated that the question is clear.

D-RAI 2.1 -4

By letters dated December 3, 2001, and March 15, 2002, the NRC issued a staff position to the Nuclear Energy Institute (NEI) which described areas to be considered and options it expects licensees to use to determine what SSCs meet the 10 CFR 54.4(a)(2) criterion (i.e., All non safety-related SSCs whose failure could prevent satisfactory accomplishment of any safety-related functions identified in paragraphs (a)(1)(i),(ii),(iii) of this section.)

The December 3rd letter provided specific examples of operating experience which identified pipe failure events (summarized in Information Notice (IN) 2001-09, "Main Feedwater System Degradation in Safety-Related ASME Code Class 2 Piping Inside the Containment of a Pressurized Water Reactor") and the approaches the NRC considers acceptable to determine which piping systems should be included in scope based on the 54.4(a)(2) criterion.

The March 15th letter, further described the staff's expectations for the evaluation of non-piping SSCs to determine which additional non safety-related SSCs are within scope. The position states that applicants should not consider hypothetical failures, but rather should base their evaluation on the plant's current licensing basis (CLB), engineering judgement and analyses, and relevant operating experience. The paper further describes operating experience as all documented plant-specific and industry-wide experience which can be used to determine the plausibility of a failure. Documentation would include NRC generic communications and event reports, plant-specific condition reports, industry reports such as SOERs, and engineering evaluations.

Based on a review of the LRA, the applicant's scoping and screening implementation procedures, and discussions with the applicant, the staff determined that additional information is required with respect to certain aspects of the applicant's evaluation of the 10 CFR 54.4(a)(2) criteria.

For example, the applicant noted that the auxiliary boiler in proximity to the service water pumps in the screen house and certain block walls panels in the vicinity of the auxiliary feedwater system were not included in scope because their failure had been analyzed as part of the Systematic Evaluation Program (SEP) and design features had been put in place to mitigate the effects of such failures. Based on the applicant's evaluation, the design features were considered within scope. However, the SEP evaluations did not specifically consider the potential for age-related degradation and subsequent failure of these non safety-related SSCs affecting safety-related SSCs under conditions when those safety-related SSCs were required to function. Based on the staff's discussions with the applicant, it appears that under certain design basis scenarios where the primary mitigative system is considered affected by the age-related degradation of a non-safety related SSC, the standby system or mitigative feature would potentially not be capable of ensuring appropriate mitigation. Given this additional insight, the staff considers that those non safety-related SSCs such as the auxiliary boiler and block wall panels, meet the 10 CFR 54.4(a)(2) criteria and therefore be included in scope of LR.

a) Based on the aforementioned information and results of the scoping and screening methodology audit interactions with the staff, describe any additional scoping evaluations performed to address the 10 CFR 54.4(a)(2) criteria? As part of your response, list any additional SSCs included within scope as a result of your efforts, and list those SCs for which AMRs were conducted, and for each SC describe the aging management program (AMPs), as applicable, to be credited for managing the identified aging effects?

b) Consistent with the staff position described in the March 15 letter, please describe your scoping methodology implemented for the evaluation of the 10 CFR 54.4(a)(2) criteria as it relates to the non-fluid-filled SSCs of interest. As part of your response, indicate the non-fluid-filled SSCs evaluated and describe the site and industry operating experience relied on to determine the potential for failures of such non-fluid-filled SSCs which could impact safety-related SSCs within scope.

Response: NRC staff to clarify question in final RAI.

D-RAI 2.1 -5

During the audit of the Ginna scoping and screening methodology, the audit team determined that the procedures reviewed in combination with the review of a sample of scoping and screening products provided adequate evidence that the scoping and screening process was conducted in accordance with the requirements of 10 CFR 54.4, "Scope," and 10 CFR 54.21, "Contents of Application — Technical Information." Additionally, the staff discussed the applicant's position concerning the potential long-term program implementation of the LRA methodology and guidance into the operational phase of the plant during the extended period of operation. As a result, the team concluded that the applicant needs to formally document the process it intends to implement to capture the LRA methodology and guidance upon which the applicant will rely during the period of extended operation at Ginna to satisfy the requirements of 10 CFR 54.35, "Requirements During the Term of Renewed License." The discussion should include, as appropriate, a description of the current configuration and design control processes including references to implementation guidance for those processes which are currently being reviewed for potential impact, and identification of any new process(s) or procedure(s) planned to address the integration of the LRA methodology and guidance into the operational phase of the plant.

Response: RG&E indicated that the question is clear.

D-RAI 2.1 -6

During the audit of the Ginna scoping and screening methodology, the staff reviewed the applicant's programs described in Appendix A, "Updated final Safety Analysis Report (UFSAR) Supplement," and Appendix B, "Aging Management Activities" to assure that the aging management activities were consistent with the staff's guidance described in section A.2, “Quality Assurance for Aging Management Programs” and Branch Technical Position IQMB-1, regarding quality assurance (QA) of the LR-SRP.

Based on the staff’s evaluation, the descriptions and applicability of the AMPs and their associated attributes to all safety-related and non safety-related SCs provided in Appendix A and Appendix B of the LRA are consistent with the staff’s position regarding QA for aging management. However, the applicant has not sufficiently described the use of the QA program and its associated attributes (corrective action, confirmation process, and document control) in the discussions provided for the existing AMPs consistent with those descriptions provided for new programs. The staff requests that the applicant revise or supplement the descriptions in the LRA Appendix A and Appendix B, to include a description of the QA program attributes, including references to pertinent implementing guidance as necessary, which are credited for existing programs. This description should be consistent with the level of detail provided for new program descriptions.

Response: RG&E indicated that the question is clear.

<u>D-RAI 2.4 -1</u>

In table 2.4.2-11, Essential Yard Structures, of the LRA, it states that the embedded portion of anchor bolts for three component groups (YARD-C-BUR, YARD-C-EXT, and YARD-C-INT) require an AMR. However, it does not address whether the exposed portion of anchor bolts require an AMR. If the exposed portion of anchor bolts requires an AMR, provide the component group, passive function, and aging management reference for them. If not, provide the basis for excluding them.

Response: RG&E indicated that the question is clear.

<u>D-RAI 2.4 -2</u>

The terms “threaded fasteners” and “anchor bolts” have been used in several tables in Section 2.4 of the LRA. Define what the terms threaded fasteners and anchor bolts consists of, and clarify whether the two terms mean the same or different items.

Response: RG&E indicated that the question is clear.

<u>D-RAI 2.4 -3</u>

In Table 2.4.2-12, Component Supports Commodity Group, it indicates that Hilti bolts are included, but Drillco Max-Bolts are excluded in the component group CSUPP-G-INT. However, it does not address whether Drillco Max-Bolts require an AMR. If you determine that Drillco Max-Bolts require an AMR, provide the component group, passive function, and aging management reference for Drillco Max-Bolts. If not, provide the basis for excluding them.

Response: RG&E indicated that the question is clear.

D-RAI 2.4 -4

On drawing 33013-1250, 1-LR, note 9 it states that a set of controlotron mounting tracks and transducers have been permanently installed and evaluated per PCR 2001-0009. At locations C5 and E5 of this drawing, these mounting tracks are shown as not subject to an AMR. Since these mounting tracks are passive and long-lived structural items, clarify if this omission was a drafting error or why they are not subject to an AMR.

Response: RG&E indicated that the question is clear.

D-RAI 2.4 -5

Are the intake structure, intake canal, cable trays and supports, tube track, reactor vessel internals, pipe hangers and supports in scope of LR? If yes, indicate the location in the LRA where they are addressed. If not, provide basis for excluding them.

Response: RG&E indicated that the question is clear.

D-RAI 3.2.1 -1

Table 3.2-1 of the LRA, line number (6), states that small-bore reactor coolant system and connected systems piping are to be sampled using appropriate volumetric examinations techniques near, but prior to the end of the current license period. This sample will be selected to include various piping sizes, configurations and flow conditions.

The staff is concerned that small bore piping could be susceptible to stress corrosion cracking (SCC) and thermal fatigue resulting from turbulent penetration and thermal stratification. Indicate how the applicant will identify how the inspection sample of pipes will be chosen such that pipes susceptible to SCC or thermal fatigue will be examined.

Response: RG&E indicated that the question is clear.

D-RAI 3.2.1 -2

Table 3.2-1 of the LRA, line number (9), pressurized water reactor (PWR) core support pads, instrument tubes (bottom head penetrations), pressurizer spray heads, and nozzles for steam generator instruments and drains indicates that the core support pads and the bottom head instrument penetrations are fabricated from Alloy 600. It also states that the reactor vessel head penetration inspection program is used to monitor crack initiation, SCC, and primary water stress corrosion cracking (PWSCC). The reactor vessel head penetration inspection program is a plant-specific program which includes participation in industry initiatives related to management of Ally 600 penetration cracking issues.

Will all the components in this item be evaluated as part of the above specified industry initiative?

0If a component will not be evaluated as part of the industry initiative provide a plant specific inspection program.

Response: Question to be clarified in final RAI.

D-RAI 3.2.1 -3

Table 3.2-1 of the LRA, line number (20), cast austenitic stainless steel (CASS), of the reactor coolant system piping indicates that the fittings (elbows) are CASS (Type CF8M).

Will CASS elbows be evaluated according to the NRC May 19, 2000, letter on CASS (Licencee Renewal Issue No. 98-0030, "Thermal Aging and Embrittlement of Cast Austenitic Stainless Steel Components")? If they will not be evaluated in accordance with the NRC May 19, 2000, letter, provide a plant specific program.

Response: Question resolved (refer to Enclosure 3).

D-RAI 3.2.2 -1

Table 3.2-2 of the LRA, line number (1), BMI Guide Tubes and Seal Table Fittings identifies these components as being susceptible to cracking from SCC.

What is the basis for including SCC as an aging effect for these components? Include the operating history for these components in the justification.

Response: RG&E indicated that the question is clear.

D-RAI 3.2.2 -2

Table 3.2-2 of the LRA, line number (2), primary nozzle safe ends, does not identify cracking due to flaw growth as an aging effect requiring management. Since the V. C. Summer main coolant loop weld cracking event involving Alloy 82/182 weld material, the staff has been addressing the effect of primary water stress corrosion cracking (PWSCC) on Alloy 82/182 piping welds on a generic basis for all currently-operating PWR plants. To resolve this current operating issue, the industry is taking the initiative to (1) develop overall inspection and evaluation guidance, (2) assess the current inspection technology, and (3) assess the current repair and mitigation technology. An interim industry report, "PWR Materials Reliability Project Interim Alloy 600 Safety Assessment for US PWR Plants (MRP-44), Part 1: Alloy 82/182 Pipe Butt Welds," was published in April 2001 to justify the continued operation of PWR plants while the industry completes the development of the final report. The staff documented its acceptance of this interim report in a safety evaluation issued June 14, 2001, which states "Should the industry not be timely in resolving inspection capabilities to identify PWSCC in Alloy 600 welds regulatory action may result." Although the final industry report on this issue has not yet been published, the staff is considering regulatory action to resolve this issue, pending receipt and review of the final industry report.

The staff requests the applicant to (a) identify the locations in Ginna reactor coolant system (RCS) piping that contains Alloy 82/182 welds, and (b) describe actions it has taken to address this operating experience as it applies to Ginna.

Response: Question to be combined with D-RAI B2.1.26 -1 in final RAI.

D-RAI 3.2.2 -3

Table 3.2-2 of the LRA, line number (11), secondary core support, diffuser plate, guide tube support pins, head vessel alignment pins, BMI columns and flux tubes, head cooling spray nozzles, upper instrumentation column, conduits, and supports, credits the Water Chemistry Control Program, but does not credit the ISI program for monitoring SCC.

GALL item IV B2.2.3 identifies rod cluster control assembly (RCCA) guide tube support pins constructed from stainless steel as being susceptible to crack initiation and growth, SCC, PWSCC, and IASCC. GALL requires the use of a PWR Vessel Internals AMP in addition to a Water Chemistry AMP.

Since components in line number (11) are from equivalent material and operate in equivalent environments as the RCCA guide tube support pins, provide a program to monitor the effects of SCC or justify why an AMP is not required.

Response: RG&E indicated that the question is clear.

D-RAI 3.2.2 -4

Table 3.2-2 of the LRA, line number (14), RCS valves, credits water chemistry for managing the effects of SCC. The staff believes that water chemistry will mitigate the effects of SCC; however, to ensure that cracking does not result in failure of the valves, the applicant is requested to provide an inspection program to monitor SCC in the valves or justify why an inspection program is not required.

Response: Question resolved (refer to Enclosure 3).

D-RAI 3.2.2 -5

Table 3.2-2 of the LRA, line number (12), upper and lower internals assembly, holddown spring, upper and lower support column bolts, and clevis insert bolts identifies these components as being susceptible to loss of preload due to stress relaxation. GALL items IV B2.1-d, IV B2.1-k, IV B2.5-h, and IV B2.5-i identify the upper internals assembly, holddown spring, lower internals assembly, and clevis insert bolts as being managed by ASME ISI and loose parts monitoring or neutron noise monitoring.

Provide justification for not including a Loose Parts Monitoring and/or a Neutron Noise Monitoring Program to manage loss of preload due to stress relaxation.

Response: RG&E indicated that the question is clear.

D-RAI 3.2.2 -6

a) Table 3.2-2 of the LRA, line number (18), pressurizer manway cover, is identified as being constructed of carbon steel with a stainless steel disc insert and being susceptible to SCC. The staff requests the applicant to specify if the stainless steel insert is a pressure boundary that requires aging management.

b) GALL item IV C2.5-m identifies pressurizer manway and flanges constructed from low alloy steel with stainless steel cladding in a primary water environment as being susceptible to SCC. GALL requires an ASME Section XI Inservice Inspection Program in addition to a Water Chemistry Control Program. The staff requests the licencee to specify an inspection program to monitor the adequacy of the applicant's specified Water Chemistry Control Program or justify why an inspection program is not required.

Response: RG&E indicated that the question is clear.

D-RAI 3.3 -1

LRA Table 3.3-1, line number (7), for components serviced by open-cycle cooling system, the applicant states that the combination of components, material and environments identified in Items V.A.6-a, V.A.6-b, V.D1.6-b and V.D1.6-c of NUREG-1801, Vol. 2, are not applicable at Ginna Station. Discuss how the AMR is to be performed for the heat exchangers, and their associated components, in the containment spray and emergency core cooling systems.

Response: RG&E indicated that the question is clear.

D-RAI 3.3 -2

LRA Section B2.1.21 states that the Ginna Station One-Time Inspection Program will include measures to verify the effectiveness of an existing AMP and confirm the absence of an aging effect. In LRA Table 3.3-2, line numbers (25), (30), (36), (41), (42), (52), (55), (63), (66), (76), (78), (80), (82), and (95), for components in treated water or treated water other environments, no existing AMPs were credited for managing the aging effect of loss of material, prior to the use of the supplemental one-time inspection program. Discuss this potential program deficiency.

Response: Question partially resolved (refer to Enclosure 3).

D-RAI 3.3 -3

LRA Table 3.3-2, line numbers (53), (64), (83), and (96), lists water chemistry control program as the AMP to manage the aging effect of loss of material for the pipe, tank, and valve body made of stainless; as well as the valve body made of case austenitic stainless steel, which are exposed to treated water-other (stagnant) environments. In view of the potential slow and stagnant flow conditions, the applicant is requested to discuss the basis for not supplementing the above program with a One-Time Inspection Program, for the verification of the effectiveness of the Water Chemistry Control Program. Clarify also that for line numbers (28), (31), (37), (56), (77), (79), and (81), the water chemistry control program alone will indeed be adequate in managing the identified aging effects for the various material/environment combinations.

Response: Question partially resolved (refer to Enclosure 3).

D-RAI 3.3 -4

In LRA Table 3.3-2, line number (11), for stainless steel fasteners (bolting) in the environment of borated water leaks, identified no aging effects requiring management. This practice may not be supported by industry experience, as stainless steel may be susceptible to corrosion when exposed to borated water leaks. Provide the basis of this determination.

Response: Question to be combined with D-RAI 3.4.1 -3 in final RAI.

D-RAI 3.3 -5

LRA Table 3.3-2, line numbers (44), (45), (67), (88), (89), for copper alloy (Zn < 15%) pipe, thermowell, and valve body exposed to containment or indoor (no air conditioning) environments, the applicant identified no aging effects requiring management. This may not be supported by industry experience, as the copper alloy material may be susceptible to corrosion in a sheltered, moistured environment. Provide the basis of this determination.

Response: Question to be combined with D-RAI 3.4.5 -1 in final RAI.

D-RAI 3.3 -6

LRA Table 3.3-2, line numbers (97) and (98), for galvanized carbon steel ventilation ductwork, exposed to air and gas (wetted)<140 or containment environments, the applicant identified no aging effects requiring management. This may not be supported by industry experience, as galvanized steel may be susceptible to galvanic corrosion or boric acid corrosion in a ventilation or sheltered environment. Provide the basis of this determination.

Response: RG&E indicated that the question is clear.

D-RAI 3.4 -3

a) The containment ventilation and essential ventilation systems discussed in section 2.3 of the LRA includes neoprene (elastomer) components in the systems. Normally these systems contain elastomer materials in duct seals, flexible collars between ducts and fans, rubber boots, etc. For some plant designs, elastomer components are used as vibration isolators to prevent transmission of vibration and dynamic loading to the rest of the system. In LRA Table 3.4-1, line number (2), the applicant identified the aging effects of hardening, cracks, and loss of strength due to elastomer degradation and loss of material due to wear. In the "Discussion" column of that row, the applicant credits the One-Time Inspection (B2.1.21) and the Periodic Surveillance and Preventive Maintenance Program (B2.1.23) for managing the hardening, cracking and loss of strength aging effects. The applicant also credited the System Monitoring

Program (B2.1.33) for managing the aging effect of loss of material due to wear. The staff noted that the scope of the One-Time Inspection Program as described on pages B-38 and -39 of the LRA does not include hardening, cracking and loss of strength as the aging effects of concern and does not include components that are exposed to air and gas.

Clarify how the one-time inspection is utilized to manage aging effects for components included in Table 3.4-1, line number (2). Also, clarify whether both the One-Time Inspection Program and the Periodic Surveillance and Preventive Maintenance Program are used for managing these aging effects. If only one of these two programs is credited for any single component, justify why One-Time Inspection alone is adequate to manage the aging effects including a discussion of the plant specific operating experience related to the components of concern to support your conclusion.

b) The staff also noted that the program description of the Periodic Surveillance and Preventive Maintenance Program on pages B-42 and -43 of the LRA includes loss of seal and not hardening and loss of strength as the aging effects of concern. Clarify whether loss of seal includes hardening and loss of strength. In addition, provide the frequency of the subject inspection described in Sections B2.1.23 and B2.2.33 for the applicable neoprene components including a discussion of the operating history to demonstrate that the applicable aging degradations will be detected prior the loss of their intended function.

Response: RG&E indicated that the question is clear.

<u>D-RAI 3.4 -4</u>

In LRA Tables 2.3.3-9 and 2.3.3-10, the AMR results for numerous components in the containment ventilation and essential ventilation systems refer to LRA Table 3.4-1, line number (5). These components include carbon/low alloy steel that are exposed to air and gas (wetted) <140 degree F. Table 3.4-1, line number (5), credits the One-Time Inspection Program, among others, for managing aging effects of loss of material due to general, pitting, and crevice corrosion and MIC for the internal environments of ventilation systems, the diesel fuel oil systems, and the emergency diesel generator systems and credited the System Monitoring Program for managing the aging effect of loss of material for external surfaces of carbon steel components.

The staff noted that the scope of the One-Time Inspection Program as described on pages B-38 and -39 of the LRA does not include components that are exposed to air and gas. In addition, LRA Section B2.1.21, “One Time Inspection”, states that the Ginna Station One-Time Inspection Program will include measures to verify the effectiveness of an existing AMP and confirm the absence of an aging effect. The applicant is requested to clarify how the One-Time Inspection is utilized to manage aging effects for the components in these two ventilation systems that are included in Table 3.4-1, line number (5). Also clarify whether both the One-Time Inspection Program and the other AMPs are used for managing these aging effects. If only one of these AMPs is credited for any single component, justify why One-Time Inspection alone is adequate to manage the aging effects including a discussion of the plant specific operating experience related to the components of concern to support your conclusion.

Response: RG&E indicated that the question is clear.

D-RAI 3.4 -5

Table 3.4-1, line number (5) of the LRA, credits the Periodic Surveillance and Preventive Maintenance Program (B2.1.23), among others, for managing aging effects for the internal surfaces of components in ventilation systems, diesel fuel oil systems, and the emergency diesel generator system; and credits the System Monitoring Program (B.2.1.33) for managing the aging effect of loss of material for external surfaces of carbon steel components. The staff notes that in Appendix B2.1.23 and B2.1.33, under “Parameters Monitored/Inspected”, it includes leakage as an example of parameters monitored/inspected. The staff is of an opinion that the presence of leakage from a component would indicate that the component’s ability to perform its intended function as a pressure boundary has already been compromised. Clarify whether any of the auxiliary systems components for which the Periodic Surveillance and Preventive Maintenance Program and System Monitoring Program are credited may rely on the monitoring of leakage. Discuss why visual inspection technique alone is sufficient in detecting the aging effects described in Appendix B2.1.23 and B2.1.33, without including other NDE procedures, such as volumetric and/or surface techniques. In addition, discuss the operating history of the above components to demonstrate that the applicable aging effects will be adequately managed prior to the loss of their intended functions.

Response: NRC staff to clarify question in final RAI.

D-RAI 3.4 -6

LRA Table 3.4-2, identifies no aging effect for numerous galvanized carbon steel components (e.g., line numbers (3), (4) ,(5), (6), (61), (62), (163), (164), ...etc.) that are exposed to the environment of air and gas, air and gas (wetted)<140 degree F, containment, or indoor (no air conditioning). The LRA states that no AMP is required and it cites site-specific review of standard industry guidance for aging evaluation of mechanical systems and components as the basis for making the conclusion. The LRA indicates that galvanized carbon steel exposed to ventilation air (T<140 degree F) would be expected to exhibit minimal deterioration of the zinc coating.

Provide the documented evidence for the above stated site-specific reviews of the standard industry guidance. In line number (62), under “Discussion”, the temperature criteria of “T<140 degree F” is not consistent with “T>140 degree F" as listed under “Environment”. Clarify this discrepancy. Similar additional information is also required for “Muffler” in line numbers (193) and (194).

Response: RG&E indicated that the question is clear.

D-RAI 3.4 -7

LRA Table 3.4-2, line number (79), identifies aging effect of cracking due to SCC for carbon/low alloy fasteners (bolting) in the containment ventilation, essential ventilation, and radiation monitoring systems from exposure to indoor (not air conditioning) environment and identified Bolting Integrity Program for managing this aging effect. However, in the “Discussion” column of that row, it indicates that SCC is not an applicable aging effect/mechanism. Clarify this discrepancy.

Response: RG&E indicated that the question is clear.

D-RAI 3.4 -8

LRA Table 3.4-2, line numbers (65), and (225) through (228) of the LRA, does not identify aging effects for neoprene pipes exposed to oil and fuel oil, raw water, and treated water other environments that require management. This determination may not be supported by industry experiences. Similar to being exposed to containment or indoor (no air conditioning) environment, as in line numbers (220) through (224), the neoprene material, when expose to the above environments, may be susceptible to changes in material properties and cracking as well. Provide the basis for not considering change in material properties and cracking as applicable aging effects for the neoprene piping components included in Table 3.4-2, line numbers (65), and (225) through (228).

Response: RG&E indicated that the question is clear.

D-RAI 3.4 -9

LRA Section B2.1.21, “One Time Inspection”, states that the Ginna Station One-Time Inspection Program will include measures to verify the effectiveness of an existing AMP and confirm the absence of an aging effect. In LRA Table 3.4-2, at various line numbers, the applicant properly uses the One-Time Inspection Program to verify the effectiveness of an existing program, such as Water Chemistry Control Program. In other cases, such as line numbers (363), (388), (395), and (438); however, the applicant simply proposed to use the One-Time Inspection Program to manage loss of material, without committing to an existing AMP. This practice may not be supported by industry experience, as one-time inspection alone may not be sufficient for an early detection of material degradation during the extended period of operation. Provide the basis of not utilizing an existing AMP prior to the supplemental One-Time Inspection Program, for the components included in the above stated line numbers.

Response: Question partially resolved (refer to Enclosure 3).

D-RAI 3.4 -10

LRA Table 3.4-2, line numbers (390), (399), (401), (403), (406), (408), (410), (412), (453), (455), (457), (461), (463), (465), and (467), uses the Water Chemistry Control Program to manage the aging effect of loss of material for the valve bodies which are made of carbon/low alloy steel, cast austenitic stainless steel, and stainless steel materials from exposure to treated water borated, treated water primary, or treated water other (stagnant) environments. In none of these cases did the applicant use One-Time Inspection Program to supplement or verify the effectiveness of the Water Chemistry Control Program in managing the aging effect. Provide the basis of not doing so, especially in view of the potential slow and stagnant flow condition for the environments of line numbers (390), (406), and (461), under which some specific locations in components may be more susceptible to corrosion.

Response: Question resolved (refer to Enclosure 3).

D-RAI 3.4.1 -1

LRA Table 3.4-2, line numbers (16) and (32), identifies the Closed-Cycle (Component) Cooling Water System (CCCCWS) Program for managing the aging effect of loss of material for stainless steel under treated water and other environments for various components in the auxiliary systems (e.g., boric acid evaporator condensers and coolers). However, the CCCCWS program does not reference EPRI TR-10736 and takes many exceptions from the GALL recommendations. Clarify how the degradation of the components such as corrosion product buildup, calcium deposits, and other parameters supposed to be monitored as recommended in GALL report can be managed under these environments.

Response: RG&E indicated that the question is clear.

D-RAI 3.4.1 -2

In LRA Table 2.3.3-1, the AMR results indicated that line number (5) of Table 3.4-1 is applicable to tanks, heat exchangers, and transmitters in the chemical volume and control system (CVCS). However, the “Discussion” column of Table 3.4-1, line number (5), does not include the CVCS components. Clarify whether Table 3.4-1, line number (5) is applicable to the tanks, heat exchangers, and transmitters in the CVCS.

Response: RG&E indicated that the question is clear.

D-RAI 3.4.1 -3

In LRA Table 2.3.3-1, the AMR results indicated that line number (81) of Table 3.4-2 is applicable for stainless steel fasteners (bolting) in the CVCS under the borated water leaking environment. However, in Table 3.4-2 line number (81), the applicant identified no aging effects and no AMP required. Explain how can leakage be found and the potential degradations of the fasteners be managed without any AMP.

Response: Question to be combined with D-RAI 3.3 -4 in final RAI.

D-RAI 3.4.2 -1

In LRA Table 2.3.3-2, the AMR results indicate that Table 3.4-1, line numbers (5) and (14), and Table 3.4-2, line numbers (120), (130), (132), (133), (151), (152), (153), (154) are applicable to heat exchangers in the component cooling water (CCW) system. It identifies the Periodic Surveillance and Preventive Maintenance Program, One-Time Inspection Program, Closed-Cycle (Component) Cooling Water System Program, and Water Chemistry Control Program for managing loss of material due to various aging mechanisms, and cracking due to SCC. However, the GALL report recommends that, in addition to the Open-Cycle Cooling Water System Program, the Selective Leaching of Materials AMP under raw water, treated water, and ground water environments be used to detect occurrence of selective leaching by hardness measurement. Confirm that parameters monitored/inspected as recommended by GALL report are adequately covered in the applicant’s AMPs identified above.

Response: RG&E indicated that the question is clear.

D-RAI 3.4.3 -1

LRA Table 3.4-2, line number (430), indicates that, for valve body (copper alloy) in the spent fuel cooling and fuel storage system, under the indoor non-air-conditioning environment, there is no aging effect. However, the Periodic Surveillance and Preventive Maintenance Program was identified as the AMP. Clarify this apparent inconsistency.

Response: Question to be combined with D-RAI 3.4.7 -1 in final RAI.

D-RAI 3.4.4 -1

LRA Table 3.4.-1 line number (14) and Table 3.4-2, line number (132), credits the Closed Cycle Cooling Water System program (AMP B.2.1.9) to manage the aging effect of loss of material due to general, pitting, and crevice corrosion as well as micro-biological influenced corrosion for heat exchangers in the waste disposal system. However, the program description for the Closed Cycle Cooling Water System program (AMP B.2.1.9) does not include waste disposal system. Clarify this discrepancy between Table 2.3.3-4 and Appendix B2.1.9.

Response: RG&E indicated that the question is clear.

D-RAI 3.4.4 -2

LRA Table 3.4.-2, line number (199), identifies the loss of material as aging effects/mechanisms for stainless steel orifice in raw water drainage environment in the waste disposal system. It further indicates that the applicable AMP is the Ginna's One-Time Inspection Program (B2.1.21). However, GALL states in Table VII Item C1.4-a that the stainless steel orifice in raw water (untreated salt or fresh water) is subject to aging effect of loss of material due to pitting, crevice corrosion, MIC, and bio-fouling. Justify whether the aging effects of MIC and biofouling have been considered. In addition, justify the adequacy of the One-Time Inspection Program for managing the aging effect including a discussion of the plant specific operating experience related to the components of concern to support its conclusion.

Response: RG&E indicated that the question is clear.

D-RAI 3.4.5 -1

LRA Table 3.4.-2, line number (167), identifies no aging effect/mechanism for copper alloy components in the service water systems that are exposed to indoor (no air condition) environment and; therefore, no AMP is required. However, the GALL report, Table VII Item F.1.2, identifies aging effect of loss of material due to pitting and crevice corrosion for copper alloy exposed to warm, moist air environment. Provide the technical basis for not identifying loss of material as an aging effect for these copper alloy components including a discussion of the plant specific operating experience related to copper alloy components that are exposed to indoor no air conditioning environment to support your conclusion.

Response: Question to be combined with D-RAI 3.3 -5 in final RAI.

D-RAI 3.4.7 -1

LRA Table 3.4-2, line number (430), indicates that for the copper alloy (Zn<15%) valve body exposed to indoor (no air conditioning), there were no aging effect requiring management (AERM) identified. However, in the same row, it identifies the Periodic Surveillance and Preventive Maintenance Program as the required AMP. Clarify the above discrepancy.

Response: Question to be combined with D-RAI 3.4.3 -1 in final RAI.

D-RAI 3.4.8 -1

LRA Table 3.4-1, line number (16), states that components within the emergency power system are subject to the Open-Cycle Cooling (Service) Water System Program as implemented by the Service Water System Reliability Optimization Program, and that this program is credited with managing the aging effects of loss of material due to general, pitting, crevice, and galvanic corrosion, MIC, and biofouling. However, in Table 2.3.3-8, under Aging Management Reference, line number (16) is not listed as a link to the AMR for any components (including heat exchanger) covered in the emergency power system. Explain the above discrepancy.

Response: RG&E indicated that the question is clear.

D-RAI 3.4.8 -2

LRA Table 3.4-1, line number (17), states that for buried piping and fittings, the Buried Piping and Tank Inspection Program is implemented by the Periodic Surveillance and Preventive Maintenance Program, and that tanks in the emergency power system are periodically inspected for signs of applicable aging effects. However, in Table 2.3.3-8, under Aging Management, line number (17) is not listed as a link to the AMR for pipe or tank covered in the emergency power system. Explain the above discrepancy. Also discuss how potential aging effects due to corrosion at tank bottom will be managed.

Response: RG&E indicated that the question is clear.

D-RAI 3.4.9 -1

LRA Table 3.4-2, line number (1), identifies loss of material as aging effect for cast iron air operated damper housing that are exposed to air and gas (wetted)<140 degree F and credits the One-Time Inspection Program for managing the aging effect. However, the staff noted that the scope of the One-Time Inspection Program as described on Pages B-38 and -39 of the LRA does not include components that are exposed to air and gas. Clarify this discrepancy. In addition, the applicant is requested to provide technical basis to justify why the One-Time Inspection Program alone is adequate to manage the aging effect including a discussion of the plant specific operating experience related to the component of concern to support its conclusion. Similarly, address the above staff's concerns for the HVAC equipment package

(Table 3.4-2 line number (162)), and valve body (Table 3.4-2, line numbers (386), (413), and (426)).

Response: RG&E indicated that the question is clear.

D-RAI 3.4.9 -2

LRA Table 3.4-2, line number (34), identifies loss of material as the aging effect for copper alloy (Zn < 15 %) cooling coil that are exposed to air and gas (wetted)<140 degree F and credited One-Time Inspection Program for managing the aging effect. However, the staff noted that the scope of the One-Time Inspection Program as described on Pages B-38 and -39 of the LRA does not include components that are exposed to air and gas. Clarify this discrepancy.

The staff also noted that LRA Table 3.4-2, line number (35), identifies the loss of material as aging effect for copper alloy (Zn < 15 %) cooling coil that are exposed to air and gas (wetted)<140 degree F and credited the Periodic Surveillance and Preventive Maintenance Program for managing the aging effect. Clarify whether both the One-Time Inspection Program and the Periodic Surveillance and Preventive Maintenance Program are used for managing the aging effect of loss of material for the same component. If only one of these two programs is credited for any single component, justify why One-Time Inspection alone is adequate to manage the aging effects including a discussion of the plant specific operating experience related to the component of concern to support your conclusion. Similarly, address the above staff's concerns for the heat exchanger included in Table 3.4-2, lines number (124) and (125).

Response: Question partially resolved (refer to Enclosure 3).

D-RAI 3.4.9 -3

LRA Table 3.4-2, line number (134), identifies loss of heat transfer as aging effect for HX-copper alloy (Zn < 15 %) heat exchanger that are exposed to raw water and credits the Open-Cycle Cooling Water System Program for managing the aging effect. The staff also noted that LRA Table 3.4-2, line number (135), identifies loss of heat transfer as aging effect for HX-copper alloy (Zn < 15 %) heat exchanger that are exposed to raw water and credited the Periodic Surveillance and Preventive Maintenance Program for managing the aging effect. Clarify whether both the Open-Cycle Cooling Water System Program and the Periodic Surveillance and Preventive Maintenance Program are used for managing the aging effect of the same component. If only one of these two programs is credited for any single component, clarify how each program is utilized to manage the aging effect for the component included in Table 3.4-2, line numbers (134) and (135).

Response: Question resolved (refer to Enclosure 3).

D-RAI 3.4.10 -1

LRA Table 3.4-2, line number (9), identifies the material for blower casing component as galvanized carbon steel. However, in the "Discussion" column of the same row, it refers to stainless steel. The LRA states that stainless steel exposed to ventilation air (T<140 degree F) would not be expected to exhibit loss of material due to pitting and crevice corrosion. Clarify the discrepancy concerning the material of the component.

Response: RG&E indicated that the question is clear.

D-RAI 3.4.11 -1

LRA Table 3.4-1, line number (13), under the “Discussion” column, indicates that the component of the cranes, hoists, and lifting devices has the potential for exposure to boric acid spillage and may be subject to the aging effect of loss of material due to boric acid corrosion. However, the AMR results of the cranes, hoists, and lifting devices as listed in the Table 2.3.3-11 of the LRA does not refer to Table 3.4-1, line number (13). Clarify this discrepancy.

Response: RG&E indicated that the question is clear.

D-RAI 3.4.12 -1

LRA Table 3.4.-2, line numbers (257), (265) and (434), identifies the loss of material as aging effect/mechanism for aluminum, cast iron, or copper alloy components in raw water drainage environment in the treaded water System. It further indicates that the applicable AMP is the One-Time Inspection Program (AMP B.2.1.21). However, the One-Time Inspection Program is used to determine whether the loss of material, due to selective leaching for aluminum, cast iron or brass components, represents significant aging effects that require aging management. Justify why the One-Time Inspection alone is adequate to manage the aging effect including a discussion of the plant specific operating experience related to the components of concern to support its conclusion.

Response: Question partially resolved (refer to Enclosure 3).

D-RAI 3.3.12 -2

LRA Table 3.4-2, line number (443), identifies no aging effect for the plastic valve body exposed to raw water drainage environment and; therefore, no AMP is required. Clarify the type of plastic material of the valve body and provide the technical basis for not considering any aging effect for that specific material from exposure to raw water drainage environment including a discussion of the plant specific operating experience related to the component of concern to support its conclusion.

Response: RG&E indicated that the question is clear.

D-RAI 3.5 -1

LRA Table 3.5-1, line number (1) of the LRA, identifies the applicant’s AMP for cumulative fatigue damage for piping and fitting in the main feedwater line, steam line, and for auxiliary feedwater piping. In the discussion column for this item, the LRA states, “Consistent with NUREG-1801. Cumulative fatigue damage is addressed as a time-limited aging analyses (TLAA) in Section 4.3.” NUREG-1801 recommends aging management of cumulative fatigue for the main steam, feedwater, and auxiliary feedwater steam and power conversion system

(SPCS) components. Tables 2.3.4-1 thru 2.3.4-4, do not identify any SPCS components that are managed for cumulative fatigue. Explain why Tables 2.3.4-1 thru 2.3.4-4 do not identify any SPCS components that are managed for cumulative fatigue.

Response: RG&E indicated that the question is clear.

D-RAI 3.5 -2

In Table 3.5-1, line number (2) of the LRA, it states that piping and fitting, valve bodies and bonnets, pump casings, tanks, tubes, tube sheets, channel head and shell (except in main steam system) shall be managed for the aging effect of loss of material due to general (carbon steel only), pitting, and crevice corrosion using the Water Chemistry Program, but the Periodic Surveillance and Preventive Maintenance Program will be used to verify corrosion is not occurring in lieu of the One-Time Inspection Program. NRC position is that corrosion may occur at locations of stagnation flow conditions and that a one-time inspection of select components and susceptible locations is an acceptable method to ensure that corrosion is not occurring and that the component's intended function will be maintained during the period of extended operation. The Periodic Surveillance and Preventive Maintenance Program does not contain specific details of this inspections. For the components listed in Table 3.5-1, line number (2) of the LRA, describe how the applicant's Periodic Surveillance and Preventive Maintenance Program verifies that the piping internal to ensure that corrosion is not occurring and that the component's intended function will be maintained during the period of extended operation.

Response: NRC staff to clarify question in final RAI.

D-RAI 3.5 -3

Loss of material due to general corrosion, pitting and crevice corrosion, micro biologically influenced corrosion (MIC), and biofouling could occur in carbon steel piping and fittings for untreated water from the backup water supply in the auxiliary feedwater system. The applicant must provide reasonable assurance that these aging effects are adequately managed. In Table 3.5-1, line number (3) of the LRA, it identifies the AMP for loss of material of auxiliary feedwater piping. In the discussion column of this item it states, "the combination of component, materials and environments identified in Item VIII.G.1-d are evaluated in the Service Water System. The Service Water System components are reviewed under NUREG-1801, Chapter VII (Auxiliary systems), Section C1." Based on this statement and the information contained in the LRA, staff could not make a reasonable assurance finding that these aging effects are adequately managed. The staff requests the applicant to describe the specific auxiliary feedwater system components exposed to untreated water from the backup water supply. Also, describe the plant specific AMP used to manage the loss of material for these auxiliary feedwater system components. The AMP should contain 10-elements which specifically describe how this aging effect is managed, using SRP-LR, Appendix A.1, paragraph A.1.2.3 for the criteria to be contained in each of the 10-elements.

Response: RG&E indicated that the question is clear.

D-RAI 3.5 -4

Loss of material due to general corrosion (carbon steel only), pitting and crevice corrosion, and MIC could occur in stainless steel and carbon steel shells, tubes, and tube sheets within the bearing oil coolers (for steam turbine pumps) in the auxiliary feedwater system. The applicant must provide reasonable assurance that these aging effects are adequately managed. In Table 3.5-1, line number (4) of the LRA for loss of material within the bearing oil coolers, the applicant states in the discussion column, "Consistent with NUREG-1801. The Periodic Surveillance and Preventive Maintenance Program is credited with managing all applicable aging effects." Since NUREG-1801 does not contain an approved AMP for loss of material within the bearing oil coolers, explain how the AMP is consistent with NUREG-1801. Also, the Periodic Surveillance and Preventive Maintenance Program does not identify the specific method used to manage for the loss of material within the bearing oil cooler. The AMP should contain 10-elements which specifically describe how this aging effect is managed, using SRP-LR, Appendix A.1, paragraph A.1.2.3 for the criteria to be contained in each of the 10-elements.

Response: Question to be combined with D-RAI 3.5 -11 and -13 in final RAI.

D-RAI 3.5 -5

Loss of material due to general corrosion could occur on the external surfaces of all carbon steel structures and components, including closure boltings, exposed to operating temperature less than 212°F. Such corrosion may be due to air, moisture, or humidity. The applicant must provide reasonable assurance that these aging effects are adequately managed. In Table 3.5-1, line number (5) of the LRA for loss of material for the external surface of carbon steel components, the applicant states, "Consistent with NUREG-1801. The System Monitoring Program is credited with managing the aging effect loss of material due to general corrosion on the external surfaces of carbon steel components." Since NUREG-1801 does not contain an approved AMP for loss of material due to general corrosion on the external surfaces of carbon steel components, explain how the AMP is consistent with NUREG-1801. Also, the Periodic Surveillance and Preventive Maintenance Program does not specifically identify inspection of all carbon steel structures and components, including closure boltings, exposed to operating temperature less than 212°F that are in an air, moisture, or humidity environment. The staff requests the applicant identify if the System Monitoring Program manages loss of material due to general corrosion of all carbon steel structures and components, including closure boltings, exposed to operating temperature less than 212°F that are in an air, moisture, or humidity environment. If the System Monitoring Program does not monitor these aging effects for carbon steel structures, components, and bolting, please identify how these aging effects are managed.

Response: Question partially resolved (refer to Enclosure 3).

D-RAI 3.5 -6

Loss of material due to general corrosion (carbon steel only), pitting and crevice corrosion, MIC, and biofouling, and buildup of deposit due to biofouling, could occur in stainless steel and carbon steel heat exchangers and coolers/condensers serviced by open-cycle cooling water. The applicant must provide reasonable assurance that these aging effects are adequately managed. In Table 3.5-1, line number (9) of the LRA for loss of material heat exchangers and coolers/condensers serviced by open-cycle cooling water, it states in the discussion column, "the Periodic Surveillance and Preventive maintenance Program will be credited with managing the applicable aging effects in lieu of the Open-Cycle Cooling (Service) Water System Program." The Periodic Surveillance and Preventive Maintenance Program does not specifically identify inspection of these heat exchangers and coolers/condensers serviced by open-cycle cooling water. The staff requests the applicant identify how the Periodic Surveillance and Preventive Maintenance Program will be used to manage loss of material due to general corrosion (carbon steel only), pitting and crevice corrosion, MIC, and biofouling, and buildup of deposit due to biofouling in stainless steel and carbon steel heat exchangers and coolers/condensers serviced by open-cycle cooling water. Also discuss if the AMP relies on the recommendations of NRC GL 89-13 to ensure that the effects of aging on the Open-Cycle Cooling Water (OCCW) system will be managed for the extended period of operation.

Response: RG&E indicated that the question is clear.

D-RAI 3.5 -7

LRA Tables 2.3.4-1 thru 2.3.4.4, 3.5-1, and 3.5-2, lists "valve body" in the component column. NRC position is that the aging effects identified in these tables, except for wall thinning due to flow-accelerated corrosion, are applicable to both the valve body and bonnet. Explain why the valve bonnets are not affected by these aging effects or provide aging management for the bonnets.

Response: RG&E indicated that the question is clear.

D-RAI 3.5 -8

Tables 3.5-1 and 3.5-2 of the LRA do not identify galvanic corrosion as an aging effect that requires management for the Steam and Power Conversion Systems. Galvanic corrosion could occur at bimetallic joints in a raw water environment where the water chemistry is not controlled. Do any conditions exists at Ginna where piping or components at should be managed for galvanic corrosion?

Response: NRC staff to clarify question in final RAI.

D-RAI 3.5 -9

Table 2.3.4-4 of the LRA for the turbine-generator and supporting systems does not list fasteners in the component group column. Are there any fasteners in these systems that require AMR? Also, if it is determined that valve and bonnets are in scope of LR, would the body to bonnet fasteners require an AMR?

Response: RG&E indicated that the question is clear.

D-RAI 3.5 -10

LRA Table 3.5-2, line numbers (38) thru (41) and line numbers (71) thru (74) identify aging management of valve bodies and pipe for cracking due to SCC and loss of material using the Water Chemistry Program. The One-Time Inspection Program is identified to verify the effectiveness of the Water Chemistry Program. Table 3.5-2, line numbers (15) and (16) identify aging management of flow elements for cracking due to SCC and loss of material using the Water Chemistry Program but does not identify the One-Time Inspection Program to verify the effectiveness of the Water Chemistry Program. Explain why the One-Time Inspection Program is not used to verify the effectiveness of the Water Chemistry Program for the flow elements which have identical material and environment as the valve bodies and pipe.

Response: NRC staff to clarify question in final RAI.

D-RAI 3.5 -11

LRA Table 3.5.2, line numbers (18) and (19), identifies the Periodic Surveillance and Preventive Maintenance Program as managing loss of heat transfer and loss of material for heat exchangers in an oil and fuel environment. The Periodic Surveillance and Preventive Maintenance Program does not contain details of this inspection. Explain how the Periodic Surveillance and Preventive Maintenance Program will manage these aging effects.

Response: Question to be combined with D-RAI 3.5 -4 and -13 in final RAI.

D-RAI 3.5 -12

LRA Table 3.5.2, line numbers (20) and (21), identify the One-Time Inspection Program as managing loss of heat transfer and loss of material for heat exchangers in a raw water environment. The NRC approved AMP for managing these aging effects is the OCCW System Program. Explain how the One-Time Inspection Program will manage these aging effects. Discuss if the AMP relies on the recommendations of NRC GL 89-13 to ensure that the effects of aging on the OCCW system will be managed for the extended period of operation. Also, use of the One-Time Inspection Program does not appear to be consistent with Table 3.5-1, line number (9), where the applicant identifies their Periodic Surveillance and Preventive Maintenance Program to managed similar aging effects for heat exchangers in an open-cycle cooling water environment.

Response: RG&E indicated that the question is clear.

D-RAI 3.5 -13

LRA Table 3.5-2, line numbers (23), (47), and (64), identifies the Periodic Surveillance and Preventive Maintenance Program as managing loss of material in an oil and fuel environment. The Periodic Surveillance and Preventive Maintenance Program does not contain details of these inspections. Explain the type of inspections and frequency performed by the Periodic Surveillance and Preventive Maintenance Program to manage this aging effect.

Response: Question to be combined with D-RAI 3.5 -4 and -11 in final RAI.

D-RAI 3.5 -14

LRA Table 3.5-2, line numbers (24), (28), and (58), identifies that there are no aging effects for carbon/low alloy steel components in an air and gas environment. In Table 3.5-2, line number (29), it identifies the One-Time Inspection Program as managing loss of material for carbon/low alloy steel components in a wetted air and gas environment less than 140°F. What criteria is used to distinguish a wetted air and gas environment from an air and gas environment?

A one-time inspection can be used to address concerns for the potential long incubation period for certain aging effects on structures and components. There are cases where either (a) an aging effect is not expected to occur, but there is insufficient data to completely rule it out, or (b) an aging effect is expected to progress very slowly. For these cases, there is to be confirmation (by one-time inspection) that either the aging effect is indeed not occurring, or the aging effect is occurring very slowly as not to affect the component or structure intended function. Based on these guidelines, provide operating experience to demonstrate that the aging effect is not expected to occur or is expected to progress very slowly the pipe identified in Table 3.5-2, line number (29).

Response: Question partially resolved (refer to Enclosure 3).

D-RAI 3.6 -1

Section 1.5.2 of the LRA provides “Passive Function Code Definitions.” One of definition is “Pressure Boundary Structure - Provide Pressure Boundary or Essentially Leak Tight Barrier to Protect Public Health and Safety in the Event of Any Postulated Design Basis Event.” The applicant is requested to provide information as to why this definition is not applicable for the Ginna containment intended functions in Section 2.4.1 under “System Function Listing.” and in Line number (1) of Table 3.6.0-1 (WCAP-14756-A).

Response: Question resolved (refer to Enclosure 3).

D-RAI 3.6 -2

Section 2.4.1 of the LRA adequately describes the unique nature of the containment structure support system. However, neither Table 2.4.1-1 grouping nor the line numbers in Table 3.6-2 include the AMR for components (e.g. neoprene (lubrite) bearing pads, tension rods) associated with the support system. The applicant is requested to provide information regarding the aging management of the accessible portions of the support system, and evaluation of the inaccessible portion of the support system that would ensure its (support system's) ability to stay functional during the extended period of operation.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -3

Section 2.4.1 of the LRA states that one of the elements associated with the tendon corrosion system is cathodic protection system (CPS). This important system does not appear either in the component grouping of Table 2.4.1-1, or in the line numbers in Table 3.6-2. The applicant is requested to provide information regarding the operating experience related to the CPS, and a description of a monitoring program that would ensure the continued functioning of the system during the extended period of operation.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -4

In line number (2), Table 3.6-1of the LRA, it states, "A review of plant-specific operating experience did not identify any occurrence of bellows failures due to SCC." The applicant is requested to provide the following information regarding aging of bellows in Ginna containment:

- Type of bellows, e.g., one ply, two-plies,
- Accessibility for IWE inspection,
- Ability to detect leakage from the bellows by (Appendix J) Type B testing,
- Occurrences of excessive leakage through the bellows.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -5

In line number (7), Table 3.6-1 of the LRA it states: "The Structures Monitoring Program requires periodic monitoring of ground/lake water to verify chemistry remains non-aggressive. The applicant is requested to provide the results of the ground water monitoring program, in terms of chlorides, sulfates, and pH of the ground water.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -6

In line number (16), Table 3.6-1 of the LRA, it discusses the aging mechanism related to "Elevated Temperature," and concludes that the temperatures are within the specified limits; therefore, loss of material, cracking, and change in material properties due to elevated temperature are not probable aging effects at Ginna, and has not been observed to date. Normally established temperature limits for concrete components is 150°F. Research has shown that change in the concrete material properties is insignificant up to this limit. However, at sustained temperature above 100°F, loss of material due to cracking and spalling are plausible aging effects. The applicant is requested to provide the following information regarding the concrete components inside Ginna containment:

- Sustained temperatures in the annulus between the primary shield wall and the reactor, and in the concrete components around the steam generators,
- The observed condition of the concrete (or liner, if applicable), in these components during the last inspection,
- Schedule for inspection of these components.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -7

For many of the LRA Table 3.6-1 and 3.6-2 entries, in addition to the GALL- recommended AMP (i.e., the Structures Monitoring Program), the Periodic Surveillance and Preventive Maintenance AMP is listed. For each of these cases, clarify the relationship between the Periodic Surveillance and Preventive Maintenance AMP and the other listed AMPs with respect to the managing of the aging effects identified for the components in Tables 3.6-1 and 3.6-2.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -8

Line number (7) of LRA Table 3.6-2 for water-control structures states that "Ginna does not utilize Reg. Guide 1.127, "Inspections of Water-Control Structures Associated with Nuclear Power Plants," and that the Structures Monitoring Program and Periodic Surveillance and Preventive Maintenance Program satisfy all the appropriate criteria and provide assurance that the intended function of water control structures will be maintained through the period of extended operation." However, the description of the Structures Monitoring Program (B2.1.32) states that it will be enhanced to be consistent with RG 1.127.

Describe the enhancements that need to be made to Ginna's Structure Monitoring Program in order to make it consistent with RG 1.127. Also describe the division of the water-control structural components between the Structures Monitoring Program and the Periodic Surveillance and Preventive Maintenance Program.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -9

The Structures Monitoring Program, Boric Acid Corrosion Program, and Bolting Integrity are all used to manage the aging of carbon steel structural fasteners (FAST(CS and HSLAS)). Describe the interaction of these three AMPs with regard to the aging management of this component group. Describe the differences between the inspection methods used by these three AMPs for this component group.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -10

Line number (17) of Table 3.6-2 discusses an applicable aging effect (loss of material) that will be managed for stainless steel components (refueling cavity, fuel transfer liners, and attachments) of the Containment Vessel through the dual application of the Boric Acid Corrosion and Periodic Surveillance and Preventive Maintenance Programs. However, no aging effect is listed for this component entry (Table 3.6-2 line number (17)). Please clarify this discrepancy.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -11

The containment component group SPP02 for the moveable hatch and equipment hatch listed in Table 2.4.1-1 of the LRA does not reference line number (4) in AMR Table 3.6-1. Line number (4) in Table 3.6-1 covers the aging effect loss of material due to corrosion through the Containment ISI and Containment Leak rate test AMPs for the personnel airlock and equipment hatch. Explain this omission.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -12

The containment component group CV-SS(CS)-TENDONS in Table 2.4.1-1 of the LRA does not reference line number (11) in AMR Table 3.6-1. Line number (11) in Table 3.6-1 covers the aging effect loss of prestress due to relaxation, shrinkage, creep, and elevated temperature through a TLAA for containment tendons and anchorage components. Explain this omission.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -13

The concrete containment component groups (CV-C-BUR, EXT, INT) in Table 2.4.1-1 of the LRA do not reference table line number (15) in AMR Table 3.6-1. Line number (15) in Table 3.6-1 covers the aging effects of (1) scaling, cracking, and spalling due to freeze-thaw and (2) expansion and cracking due to reaction with aggregate through the Containment ISI AMP for concrete elements foundation, dome, and walls. Explain this omission.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -14

Line number (19) in Table 3.6-1 of the LRA is for Group 5: liners, and covers the spent fuel pool liner and refueling transfer canal liner. This table entry covers the aging effects crack initiation and growth from SCC and loss of material due to crevice corrosion through the Water Chemistry Program and monitoring of the spent fuel pool water level. However, line number

(19) in Table 3.6-1 is not referenced for any of the component groups in Tables 2.4.2-1 through 2.4.2-12. Explain this omission.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -15

Line number (26) in Table 3.6-1 of the LRA is for the supports for ASME piping and components and covers the aging effect cumulative fatigue damage through a TLAA. The discussion column for this table entry states that a fatigue analysis for structures and components is not incorporated into Ginna Station’s current licensing basis. NUREG-1801 recommends aging management of cumulative fatigue for these support components. Explain how the aging effect of cumulative fatigue for supports for ASME piping and components will be managed during the period of extended operation.

Response: RG&E indicated that the question is clear.

D-RAI 3.6 -16

The Structural Monitoring Program and Boric Acid Corrosion AMPs are used to manage the aging of carbon steel expansion/grouted anchors (CSUPP-EXP(CS)). Neither of these AMPs in Appendix B of the LRA describe how the aging of this component group will be managed. In addition, the AMPs XI.S6, “Structures Monitoring Program,” and XI.M10, “Boric Acid Corrosion,” do not describe the aging management of carbon steel expansion/grouted anchors. Provide additional information regarding the aging management proposed for carbon steel expansion/grouted anchors.

Response: RG&E indicated that the question is clear.

D-RAI 4.1 -1

Table 4.1-1 of the LRA identifies time-limited aging analysis (TLAAs) applicable to the Ginna Station. Tables 4.1-2 and 4.1-3 in NUREG-1800 identify potential TLAAs determined from the review of other LRAs. The LRA indicates that NUREG-1800 was used as a source to identify potential TLAAs. For those TLAAs listed in Tables 4.1-2 and 4.1-3 of NUREG-1800, that are applicable to PWR facilities and not included in Table 4.1-1 of the LRA, discuss whether there are any calculations or analyses that address these topics at the Ginna Station. If calculations or analyses exist that address these topics, discuss how the these calculations or analyses were evaluated against the TLAA definition provided in 10 CFR 50.3.

Response: RG&E indicated that the question is clear.

D-RAI 4.2.1 -1

Section 4.2.1 of the LRA indicates that the upper shelf energy for the reactor vessel beltline weld material will be less than 50 ft-lbs at the end of the extended period of operation. Consequently, a low upper-shelf fracture mechanics analysis has been performed to evaluate the weld material for ASME Levels A, B, C, and D. To confirm the upper shelf energy (USE) analysis meets the requirements of Appendix G of 10 CFR Part 50 at the end of the LR period.

a) For each beltline material that is projected to exceed 50 ft-lb at the end of the license LR, provide the unirradiated Charpy USE, the projected Charpy USE at the end of the LR period, whether the drop in Charpy USE was determined using the limit lines in Figure 2 of RG 1.99, Revision 2, or from surveillance data and the percentage copper.

b) If an equivalent margins analysis was required to demonstrate compliance with the USE requirements in Appendix G of 10 CFR 50, provide the analysis or identify an approved topical report that contains the analysis. Information the staff will require to assess the equivalent margins analysis includes: the unirradiated USE (if available) for the limiting material, its copper content, the fluence (1/4T and at 1 inch depth), the end of extended license USE (if available), the operating temperature in the downcomer at full power, the vessel radius, the vessel wall thickness, the J-applied analysis for Service Levels C and D, the vessel accumulation pressure, and the vessel bounding heatup/cooldown rate during normal operation.

Response: RG&E indicated that the question is clear.

<u>RAI 4.2.2 -1</u>

In Section 4.2, "Reactor Vessel Neutron Embrittlement," of the LRA it is stated that the methodology used to perform neutron fluence calculations is consistent with Regulatory Guide 1.190. Explain how the calculation adheres to the guidance of RG 1.190; i.e. what code(s) were used, how were they benchmarked, what approximations were used, what cross sections, how were the sources derived, were there any adjustments of the calculations with respect to measured surveillance capsule dosimetry, etc.

Response: RG&E indicated that the question is clear.

<u>D-RAI 4.3.1 -1</u>

Section 4.3.1 of the LRA contains a discussion of the transients used in the design of the reactor coolant system components at the Ginna Station. The LRA indicates that a review concluded that the existing design cycles and cycle frequencies are conservative and bounding for the period of extended operation. Provide the following information for each of the design transients reviewed:

a) The current number of operating cycles and a description of the method used to determine the number of the design transients from the plant operating history.

b) The number of operating cycles estimated for 60 years of plant operation and a description of the method used to estimate the number of cycles at 60 years.

c) A comparison of the design transients with the transients monitored by the Fatigue Monitoring Program described in Section B.3.2 of the LRA. Identify any transients listed in the LRA that are not monitored by the FMP and explain why it is not necessary to monitor these transients.

Response: RG&E indicated that the question is clear.

D-RAI 4.3.1 -2

Westinghouse Owners Group issued Topical Report WCAP-14577, Revision 1-A, "Aging Management for Reactor Internals," to address the aging management of the reactor vessel internals (RVI). The staff review of WCAP-14577, Revision 1-A identified a number of issues that should be addressed on a plant specific basis. Renewal applicant action item 11 specified in WCAP -14577, revision 1-A, indicates that the fatigue TLAA of the reactor vessel internals should be addressed on a plant specific basis. In Table 3.2.0-2 of the LRA, RG&E indicates that a discussion of the reactor vessel internals is contained in Section 4.3 of the LRA. Section 4.3 of the LRA indicates that the reactor vessel internals were designed in accordance with Westinghouse criteria which were later incorporated into the ASME Code. Discuss the transients that contribute to the fatigue usage for each component listed in Table 3-3 of WCAP-14577, revision 1-A, and discuss how the these transients were evaluated during the transient review discussed in D-RAI 4.3.1 -1.

Response: RG&E indicated that the question is clear.

D-RAI 4.3.2 -1

Section 4.3.2 of the LRA contains a discussion of the evaluation of USA Standard B31.1 components at the Ginna Station. The LRA indicates that the USA Standard B31.1 limit of 7000 equivalent full range cycles may be exceeded during the period of extended operation for the nuclear steam supply system (NSSS) sampling system and that an engineering evaluation will be performed prior to the period of extended operation. The LRA further indicates that the effects of fatigue may be managed by an inspection program if the results of the engineering evaluation are not acceptable. The UFSAR Supplement provided in Section A3.3.3 does not discuss this option. Clarify the proposed options for addressing the NSSS sampling system and provide an update of the UFSAR Supplement, if necessary. In addition, describe the existing qualification of the NSSS sampling system and provide the maximum calculated thermal stress range for affected portions of the system.

Response: RG&E indicated that the question is clear.

RAI 4.3.3 -1

In Section 4.3.3 of the LRA, it is stated that the NRC reviewed WCAP-15338 and included two applicant action items to verify that a plant is bounded by the report evaluation and that the TLAA be described in the plant UFSAR supplement. For the plant to be bound by WCAP-15338 it must be bound by the number of cycles and transients assumed in WCAP-15338. Therefore, has the analysis of the number of cycles and transients been accomplished and, if so, are they within the assumed bounds of WCAP-15338?

Response: RG&E indicated that the question is clear.

RAI 4.3.5 -1

In Section 4.3.5 of the LRA, it is stated that using a 15° focused beam search unit, the indication was resolved into two separate indications which met the criteria for acceptance by examination in ASME Section XI, 1974 with Summer 1995 Addenda. However, according to the staff evaluation section of the referenced document, USNRC Letter Johnson to Mecredy, “Ginna Flaw Indication in the Reactor Vessel Inlet Nozzle Weld - 1989 Reactor Vessel Examination (TAC No. 71906),” July 7, 1989, “The staff’s evaluation determined that the licensee’s final dimensions of 4.94" x .48" is a realistic representation of the actual flaw size. If the flaw length were assumed constant, a reduction of .036" in the depth dimension (.480" - .44") would result in a flaw indication that meets the ASME Section XI acceptance standard.” Consequently, according to the staff SER, the dimensions of the flaw are not within ASME Section XI acceptance standards. Therefore a fatigue analysis for the extended period of operation for this flaw is a TLAA and its results must be provided in accordance with 10 CFR 54.21(c).

Response: RG&E indicated that the question is clear.

D-RAI 4.3.7 -1

Section 4.3.2 of the LRA discusses RG&E’s evaluation of the impact of the reactor water environment on the fatigue life of components. The discussion references the fatigue sensitive component locations for an older vintage Westinghouse plant identified in NUREG/CR-6260, “Application of NUREG/CR-5999 Interim Fatigue Curves to Selected Nuclear Power Plant Components.” The LRA indicates that the later environmental fatigue correlations contained in NUREG/CR-6583, “Effects of LWR Coolant Environments on Fatigue Design Curves of Carbon and Low-Alloy Steels,” and NUREG/CR-5704, “Effects of LWR Coolant Environments on Fatigue on Fatigue Design Curves of Austenitic Stainless Steels,” were considered in the evaluation. Provide the following information for the six component locations listed in NUREG/CR-6260:

a) For those locations with existing fatigue analyses, provide the results of the fatigue usage factor calculation, including the calculated environmental multiplier (Fen). Show how Fen was calculated.

b) For the USA Standard B31.1 locations discussed in Section 4.3.7.3 of the LRA, describe the fatigue usage factor calculation and provide the calculated fatigue usage factor. Include a detailed comparison of the Ginna Station components with the components listed in NUREG/CR-6260 and discuss the significance of the differences. This comparison should also include any differences in the thermal sleeve designs. In addition, provide a comparison the design transients used in the analysis of the NUREG/CR-6260 components with the anticipated transients for the Ginna Station components.

Response: RG&E indicated that the question is clear.

D-RAI 4.5 -1

In order for the staff understand the quantitative aspect of the analysis, the applicant is requested to provide the following information:

a.) For the 37 tendons which were retensioned in 1969, provide the predicted lower limit line, MRV expected in 2005 and at 60 years (if not retensioned in 2005), a trend line for this group of tendons, and prestressing force values as points above and below the trend line measured during prior inspections.

b.) Provide the same information for the remaining 137 tendons, for the inspections performed after 1980 retensioning.

Response: Question to be combined with D-RAI B3.3 -1 in final RAI.

D-RAI 4.5 -2

Section A4.1 (UFSAR Supplement) of the LRA gives a qualitative description regarding the prestressing forces in the Ginna Station containment. The staff believes that the applicant should, as a minimum, provide target prestressing forces that will be maintained at 40 years and 60 years. The applicant is requested to supplement the present description in Section A4.1 with the basic quantitative description, such as, the minimum required prestressing forces, and the extrapolated prestressing forces at 40 and 60 years.

Response: RG&E indicated that the question is clear.

D-RAI 4.6 -1

Provide a list of design transients and corresponding cycles that were prescribed in the design of the containment penetrations.

Response: RG&E indicated that the question is clear.

D-RAI 4.6 -2

For the penetration sleeve and the annular plate connecting the pressure piping to the sleeve, provide the analysis that shows that the six conditions of ASME Section III, Subsection A, N-415.1, 1965, will be satisfied for the period of extended operation.

Response: RG&E indicated that the question is clear.

D-RAI 4.6 -3

Indicate if the hot piping penetration assemblies contain bellows. If yes, provide the basis for not identifying fatigue of these bellows as TLAAs, in accordance with 10 CFR 54.3.

Response: RG&E indicated that the question is clear.

D-RAI 4.7.3 -1

Provide the design transients and corresponding cycles which generated the static stress of 13,600 psi in the fillet weld attaching the channels to the liner.

Response: RG&E indicated that the question is clear.

D-RAI 4.7.3 -2

Indicate the design code to which the fatigue analysis of the fillet welds attaching the channel anchors to the liner was performed.

Response: RG&E indicated that the question is clear.

D-RAI 4.7.3 -3

Provide justification why a fatigue-strength reduction factor was not applied to the stress caused by static loading for determining the allowable cycles for the fillet weld attaching the channel anchors to the liner.

Response: RG&E indicated that the question is clear.

D-RAI 4.7.3 -4

Provide detailed clarification why this fatigue analysis may not meet the definition of a TLAA, as described in 10 CFR 54.3.

Response: RG&E indicated that the question is clear.

D-RAI 4.7.4 -1

The applicant is requested to provide the UFSAR section numbers where the staff can find information regarding the allowable radial and vertical displacements of the containment stainless steel tendon bellows, and calculations showing the fatigue usage factor less than 0.01.

Response: RG&E indicated that the question is clear.

D-RAI 4.7.5 -1

Section 4.7.5 of the LRA states that the estimated cycle numbers were compared to the design load cycles and that the estimated numbers are well below the upper design load cycle limit. Provide the estimated number of load cycles and also the assumptions used in the estimation. In addition provide the upper design loading cycle limit.

Response: RG&E indicated that the question is clear.

D-RAI 4.7.5 -2

Section 4.7.5 of the LRA states that the average percent of the rated load lifted is less than 50% for the design load cycles. What is the assurance that this percentage will not change in the future during the period of extended operation.

Response: RG&E indicated that the question is clear.

D-RAI 4.7.7 -1

The thermal aging embrittlement effect (loss of fracture toughness) on cast austenitic stainless steel is time dependent and is treated as a TLAA. The applicant performed a leak-before-break (LBB/flaw tolerance) analysis to demonstrate that leaks from reactor coolant system (RCS) piping can be detected prior to the cracks growing to a size that would become unstable. The applicant referenced a Westinghouse report (WCAP-15837, 'Technical Justification for Eliminating Large Primary Loop Pipe Rupture as the Structural Design Basis for the R. E. Ginna Nuclear power Plant for the License Renewal Program," April 2002) for its LBB analysis. The applicant also performed a fracture mechanics analysis in accordance with the requirements of ASME Code Case N-481 for the cast austenitic stainless steel (CF8M) reactor coolant pump (RCP) casings for the extended operation period. This fracture mechanics analysis was documented in a Westinghouse report (WCAP-15873, "A Demonstration of the Applicability of ASME Code Case N-481 to the Primary Loop Casings of R. E. Ginna Nuclear Power Plant for the License Renewal Program," April 2002). Code Case N-481 allows the required volumetric inspection of RCP casings to be replaced by a visual examination with the performance of an evaluation to demonstrate the safety and serviceability of the pump casings.

a) Confirm whether the two Westinghouse reports (WCAP-15837 and WCAP-15873) referenced in Section 4.7.7 have been submitted to NRC for review and approval. If these reports have been approved by NRC, identify the NRC approval documents. If these reports have not been reviewed and approved by NRC, submit the reports on the "docket" for Ginna's LRA.

b) If the reports have not been reviewed and approved by NRC, confirm whether the NRC approved methodologies including the material properties and other input parameters were used in the analysis. Also identify areas in the referenced Westinghouse analyses that deviate from NRC recommended guidelines and provide justification for each deviation. If the requested information is already available in the referenced reports, summarize the information and identify the relevant sections in the reports.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.1 -1

The Aboveground Carbon Steel Tanks AMP is not specifically used for aging management at Ginna station as it is implemented by the Systems Monitoring and One-Time Inspection Programs.

a) Provide a list of all aboveground carbon steel tanks that are within the scope of LRA including a description of the content inside the tank and the storage condition such as temperature and pressure. Also provide justification for not inspecting the interior tank surface.

b) Identify the aboveground carbon steel tanks that are not within the scope of this program and provide the justification for not including those tanks into the scope of this program.

c) The staff notes that a one-time inspection of the reactor makeup water tank prior to the period of extended operation will be performed for tank bottom thickness measurements. Provide justification for not performing one-time inspection on the other aboveground carbon steel tanks.

d) The staff notes that the bottom thickness measurement of the aboveground carbon steel tanks are not identified in the scope of program for the one-time inspection program. Since the subject program will not be specifically used for aging management at Ginna station, the performance of bottom thickness measurement of the aboveground carbon steel tanks should be identified in the scope of the one-time inspection program. If not, provide the justification for its exclusion.

e) Does this program provide guidance for the selection of locations with the highest likelihood of corrosion problems for thickness measurements, such as the locations where there is observed degradation of sealant or caulking at the interface edge between the tank and foundation which would allow penetration of water and moisture and cause corrosion of the bottom surface?

f) Provide guidance in this programs for sample expansion and increasing frequency of inspection when surface degradation is observed.

g) Discuss the bases for not monitoring/inspection the potential corrosion or degradation of the internal surfaces of the buried piping and tanks.

Response: Question partially resolved (refer to Enclosure 3).

D-RAI B2.1.3 -1

Regarding the overall loss of prestressing forces in the majority of the containment tendons, provide a summary of the corrective actions taken, including the root cause determination, and the results of subsequent inspections.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.3 -2

As described in Section 2.4.1 of the LRA, the support system of the Ginna containment is unique, and its inspection requirements are not specifically addressed in Subsections IWE and IWL of Section XI of the ASME Code. Provide information regarding the inspection of the support system.

Response: NRC staff to clarify question in final RAI.

D-RAI B2.1.3 -3

Moisture barrier degradation and minor corrosion of the liner has been detected during prior inspections. The applicant is requested to provide, (a) the acceptance criteria used for repairing the liner plate, (b) the successive (IWE-2420), additional (IWE-2430), and augmented [IWE-2500(c)] liner inspections performed (and will be performed), and (b) sampling plans (if any) for removing the insulation for the purpose of inspection.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.3 -4

The LRA states that ASME Section XI, Subsections IWE and IWL ISI is consistent with NUREG-1801, Section XI.S4. The “Scope” of GALL Program XI.S4, provides two options for monitoring the performance of containment isolation valves. The applicant is requested to provide information regarding the applicant’s choice of option for performing Type C testing during the period of extended operation.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.3 -5

Section A2.1.3 of Appendix A (UFSAR Supplement) of the LRA summarizes the contents of the IWE and IWL AMP. However, it does not include the containment leak rate testing (i.e. GALL Report Section XI.S4) as part of the AMP. The applicant is requested to provide information regarding the inclusion of this aspect of the AMP in the UFSAR supplement.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.4 -1

It is stated in LRA Section B2.1.4, “ASME Section XI, Subsection IWF Inservice Inspection”, that Industry operating experience was incorporated into the LR process through a review of industry documents to identify aging effects and mechanisms that could challenge the intended function of systems and structures within the scope of LR. Review of plant specific operating experience was performed to identify aging effects. The staff noted that there are instances where industry operating experience is not included in the Ginna IWF Program; for instance, loss of material due to general corrosion for the bolts and anchorage, stress corrosion cracking due to improperly heat-treated anchor bolts, deformation or structural degradations of fasteners, springs, clamps, loss of hanger mechanical function, and improper clearances of guides and stops. Note that in NUREG-1801, Section XI.S3, “ASME Section XI, Subsection IWF”, under “Parameters Monitored or Inspected,” it states that VT-3 visual examination will be used to monitor or inspect component supports for corrosion; deformation; misalignment; improper clearances; improper spring settings; damage to close tolerance machined or sliding surfaces; and missing, detached, or loosened support items. The applicant is requested to discuss how its IWF program was considered to be consistent with the GALL IWF program, considering conformance of all the relevant program elements.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.4 -2

In LRA Section B2.1.4, “ASME Section XI, Subsection IWF Inservice Inspection”, it is stated that discovery of deficiencies during regularly scheduled inspections results in an expansion of inspection scope to assure that the full extent of the deficiencies is identified. Degradation that potentially compromises the support function or load capacity is identified for evaluation. The deficient incidents for pipe and component supports and anchorages have been corrected in accordance with the requirements of Subsection IWF. Provide a discussion and examples of expanding inspection scope when discovering deficiencies in supports and anchorage and evaluating the identified degradation of supports and anchorages at Ginna.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.6 -1

The LRA indicated that the Boric Acid Program will be consistent with GALL. Identify when the program will be consistent with GALL?

Describe the changes that must be incorporated to make the program consistent with GALL.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.6 -2

As a result of the insights gained from the recent discovery of boric acid-induced corrosion of the Davis-Besse vessel, the staff requests that the applicant address the changes that were made to its boric acid corrosion prevention program in response to the Davis-Besse event.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.7 -1

The Buried Piping and Tanks Inspection AMP consists of implementing preventive measure such as applying protective coating and periodic inspections when inspection opportunities arise to manage the corrosion effect on the external surfaces of buried carbon steel piping and tanks. In addition, the LRA states that this program is not specifically used for aging management at Ginna Station, as the inspection activities are performed through the One-Time Inspection Program.

a) Confirm whether this program is consistent with the guidelines provided in AMP XI.M34 (Buried Piping and Tanks Inspection) of NUREG-1801. Discuss all the deviations from AMP XI.M34 and provide justification for each deviation.

b) Provide a list of all buried carbon steel piping and tanks that are within the scope of LRA. Identify all buried carbon steel piping and tanks that are within the scope of this program and provide the justification for those not included in the program.

c) For each buried piping and tank, describe what preventive measures such as coating, wrapping or other protective measures are applied to mitigate the corrosion of its external surfaces.

d) Discuss how the proposed inspection frequency based on the inspection of opportunity would provide adequate assurance that the corrosion of external surfaces of the buried piping and tanks will not occur when the opportunity for inspection does not arise.

e) Confirm whether the inspection activities of buried piping and tanks should be identified in the One-Time Inspection Program.

Response: NRC staff to clarify question in final RAI.

D-RAI B2.1.8 -1

The Buried Piping and Tanks Surveillance AMP does not employ the guidance provided in the NACE Standards of RP-0285-95 and RP-0169-96 to manage the corrosion effect on the external surface of buried carbon steel piping and tanks. The guidance provided in the referenced NACE Standards are recommended in NUREG-1801 for implementing the surveillance and preventive measures to mitigate corrosion on the external surface of buried carbon steel piping and tanks. Instead, the applicant's AMP relies on the implementation of ten existing AMPs to maintain the intended functions of buried carbon steel piping and tanks.

a) Provide a list of all buried carbon steel piping and tanks that are within the scope of LRA. Identify all buried carbon steel piping and tanks that are within the scope of this program and provide the justification for those not included in the program.

b) For each buried piping and tank, describe what preventive and surveillance measures such as coating, wrapping, cathodic protection system or other protective measures are applied to mitigate the corrosion of its external surfaces.

c) For each buried piping and tank, Identify the applicable AMPs and discuss in details as how would the applicable AMPs provide adequate protective and surveillance measures to mitigate the corrosion of its external surfaces.

d) Discuss in details as how would the 10 referenced AMPs meet the guidance provided in NACE Standards RP-0285-95 and RP-0169-96 in providing adequate preventive and surveillance measures to mitigate corrosion of external surface of buried carbon steel piping and tanks.

e) Cathodic protection system has been shown to be effective in mitigating corrosion of external surfaces of buried piping and tanks. Discuss the feasibility of implementing such protective system on the piping and tank components where adequate protective and surveillance measures are not applied.

f) In Section A2.1.7 of the LRA, “Buried Piping and Tanks Inspection,” it states that preventive measures are in accordance with standard industry practice for maintaining external coatings and wrappings. Describe the preventive measures that are applied and compare them with the guidance provided in the NACE Standards RP-0285-95 and RP-0169-96 to determine their adequacy.

Response: NRC staff to clarify question in final RAI.

D-RAI B2.1.9 -1

Section B2.1.9 of the LRA does not conclude if the Closed-Cycle (Component) Cooling Water System Program is/is not consistent with the GALL, but identifies some areas where the program differs from the GALL. Tables 3.3-1, 3.4-1 and 3.5-1 indicate the CCW Program is consistent with the GALL and requires no further evaluation.

Resolve the potential discrepancy regarding if the program is intended to be consistent with the GALL. If it is determined the program is not consistent with GALL, discuss how the CCW program meets the ten elements of an AMP.

If the program is intended to be consistent with GALL, discuss the following:

a) System chemistry sampling will not permit detection of aging effects. Discuss operating experience or information regarding monitoring, testing and inspections performed on the system/components to ensure aging effects are identified prior to a loss of function.

b) Maintaining and monitoring system chemistry alone does not ensure that heat transfer capabilities are maintained. Loss of heat transfer is identified as an AERM that will be monitored by the Closed Cycle Cooling Water System. Discuss operating experience and/or testing and monitoring attributes of the program that prevent loss of heat transfer.

c) The applicant samples for pH, chromates and radioactivity, and indicates sampling for corrosion products, calcium, potassium, and refrigerant chemicals is not performed based on plant operating experience. Discuss the operating experience and past samples taken (if any) that support not testing for corrosion products, calcium, potassium, and refrigerant chemicals.

d) EPRI TR 107396 (Closed Cooling Water Chemistry Guideline) recommends that conductivity, chlorides, and sulfates should be monitored in a chromated water system. EPRI TR 107396 indicates that chlorides and sulfates may reduced the efficacy of chromate inhibitors. Further, chlorides and sulfates may negatively impact the corrosion resistance of some alloys in the CCW system. Discuss the program bases for not monitoring these (chlorides and sulfates) parameters as outlined in TR107396 for chromated systems.

e) It may be difficult to establish and maintain chemistry controls in stagnant and low flow sections of systems. Describe how the CCW Program addresses aging effects in these areas.

f) The LRA indicates that due to condensation, external corrosion affected the surface of some CCW piping. Ultrasonic test (UT) readings were taken and no significant wall thinning was noted. Discuss how much of the system was affected, the extent of the UT inspections, how long the affected piping had been in service and how any indicated wall thinning was attributed to internal or external corrosion.

g) The applicant indicates that non destructive examinations (NDE) are used at locations were material loss may occur. Discuss how the CCW Program identifies areas for NDE inspection, the frequency of inspection, acceptance criteria and how the data are trended to ensure detection of aging effects.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.10 -1

Section 2.3.3.18 of the LRA states that the plant air system is not safety-related and does not perform a safety-related function and, as such, the plant air systems are not within the scope of LR. It further states that portions of plant air act as containment isolation devices and those portions are evaluated in the containment isolation system. Clarify and provide the bases of the LR intended functions of the plant air system for containment isolation devices. Also, identify the aging mechanisms and the AMPs required for this system or justify why an AMP is not required.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.10 -2

Provide the UFSAR supplements related to this program (refer to question D-RAI B2.1.10 -1), as applicable.

Response: Question to be combined with D-RAI B2.1.10 -1.

D-RAI B2.1.15 -1

In order for the staff to evaluate the acceptability of the Flow Accelerated Corrosion (FAC) Program, the applicant should provide a list of the components in the program most susceptible to FAC. The list should include initial wall thickness (nominal), current wall thickness, and the future predicted wall thickness.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.15 -2

The FAC Program at Ginna provides a prediction of the wall thinning for the components susceptible FAC. The wall thinning is predicted by the EPRI’s CHECWORKS computer code. In order to allow the staff to evaluate the accuracy of these predictions, the applicant is requested to provide a few examples of the components for which wall thinning is predicted by the code and at the same time measured by UT or any other method employed in the applicant’s plant.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.16 -1

Specify if the Fuel Oil Chemistry Program described in Section B2.1.16 of the LRA is consistent with the XI.M30 program in the GALL. The applicant should also evaluate the following deviation from the GALL program: not testing for biological activity or adding biocide to the fuel oil.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.16 -2

The LRA states that particulate sampling is not conducted in accordance with the modified ASTM D2276 standard. What standard is used for determining concentration of the particles in the diesel fuel oil?

Response: Question to be combined with B2.1.16 -1.

D-RAI B2.1.16 -3

The LRA states that underground tanks have been drained and inspected annually until 1993. However, since 1993 only pressure tests are performed annually and internal inspections are performed on a 10-year frequency. Provide the rationale for changing the inspection frequency of the underground storage tanks from annual to a 10-year frequency.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.18 -1

It is stated in the LRA Section B2.1.18, that some inconsistencies were identified between crane operation and crane licencing basis at some plants in Bulletin 96-02, “Movement of Heavy Loads over Spent Fuel, Over Fuel in the Reactor Core, Over Safety-Related equipment.” Indicate whether or not any such inconsistencies have been identified at Ginna, either before or after the issuance of the Bulletin 96-02. If inconsistencies were identified, provide the corrective actions that were taken.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.18 -2

Clarify whether or not wire ropes are among the subcomponents that are managed for age related degradation. Provide the inspection methods and acceptance criteria for the wire ropes.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.21 -1

The LRA concludes that the One-Time Inspection Program will be consistent with GALL Program XI.M32, “One-Time Inspection.” A one-time inspection is generally appropriate for confirming the absence of significant aging effects. A review of the AMR tables in Section 3 of the LRA indicates that this program is being credited for items where aging is considered likely, such that a periodic inspection may be more appropriate than a one-time inspection. Justify why a one-time inspection is appropriate for the following:

- Change in material properties of Neoprene,
- Loss of material of cast iron and carbon steel in raw water, treated water (where One-Time Inspection is the only AMP), and drainage water,
- Loss of heat transfer of cast iron in raw water.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.21 -2

The staff finds that the UFSAR Supplement is generally consistent with the program description in Appendix B of the LRA; however, the UFSAR supplement does not provide a level of detail commensurate with the SRP-LR. The applicant is requested to augment the UFSAR description to include the items in scope of the One-Time Inspection.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.21 -3

Provide additional information on the construction (e.g., wrapped or protected), condition (any previous inspections), and environment of the buried fuel oil storage tank in the emergency power system.

The staff notes that the applicant does not credit a Buried Tank and Piping Inspection Program. Provide sufficient information to justify why a one-time inspection (ultrasonic wall thickness measurement), and periodic visual inspection of the tank internals under the Periodic Surveillance and Preventative Maintenance Program are adequate to manage aging of this tank.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.21 -4

Provide information, similar to question D-RAI B2.21 -3 above, on the buried carbon steel pipe in the hydrogen detectors and recombiner system to justify using the One-Time Inspection Program as the only aging management for this pipe.

Response: Question to be clarified in final RAI.

D-RAI B2.1.22 -1

The LRA indicates that the service water system is consistent with the GALL report with two minor differences: 1) heat transfer tests are not performed on selected small heat exchangers which are periodically cleaned and inspected in accordance with the Periodic Surveillance and Preventive Maintenance Program, and 2) the Service Water System Reliability and Optimization Program (SWSROP) does not address protective coatings which are not credited for aging management in the Ginna service water system.

With regards to the first difference, discuss the following:
a) How and what criteria are used to scope heat exchangers into the service water system or the Periodic Surveillance and Preventive Maintenance Program.

b) What parameters are monitored/inspected during the preventive maintenance action, and what method is used to detect aging.

c) How is heat exchanger maintenance periodicity established.

d) What and how are results trended with respect to applicable aging mechanisms.

e) What acceptance criteria are incorporated into the preventive maintenance action.

Also, the LRA indicated in the conclusion section of the Periodic Surveillance and Preventive Maintenance Program that the program must be enhanced to address aging mechanisms and monitoring. Discuss if and how this is applicable to the small heat exchangers within the Service Water System Program and when actions will be complete. Describe the enhancements to the program; i.e. change in scope, procedures and/or methods applied to small heat exchangers.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.22 -2

The LRA indicates that the service water system is consistent with the GALL report with two minor differences: 1) heat transfer tests are not performed on selected small heat exchangers which are periodically cleaned and inspected in accordance with the Periodic Surveillance and Preventive Maintenance Program, and 2) the Service Water System Reliability and Optimization Program (SWSROP) does not address protective coatings which are not credited for aging management in the Ginna service water system.

With regards to the second difference, the program attributes of GL-89-13 and GALL identify inspection, monitoring and corrective action for failed internal coatings that could adversely impact heat transfer capability or lead to corrosion in service water systems. Not crediting the protective coatings does not eliminate the possibility that coating failure could have an adverse impact on heat transfer capabilities or corrosion.

Discuss how the Ginna SWSROP ensures internal coating (if any coatings are used) failure will not adversely impact heat transfer capability or corrosion of system components and provide operating experience supporting the applicants position.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.22 -3

The LRA identified that a number of heat exchangers have been replaced or retubed. Discuss the mechanisms leading to retubing or replacement, the means used to identify the degradation, if loss of pressure boundary integrity occurred, and any changes made to the Open Cycle Cooling Water Program as a result of the degradation.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.23 -1

It is stated in the LRA Section B2.1.23, that cracking and material thinning will be detected by performing visual inspections and surface examinations. Since subsurface cracking and thinning cannot be detected by such methods, indicate the methods which will be employed to detect such defects.

Response: NRC staff to clarify question in final RAI.

D-RAI B2.1.23 -2

It is stated in the LRA Section B2.1.23, that inspection for leakage may be utilized for managing ageing effects in selected piping and components. It is the staffs position that actual leakage is indicative of piping or component failure; therefore, the AMP should be aimed at detecting and preventing loss of material so that corrective actions can be taken prior to the occurrence of leakage. Identify the specific circumstances where leakage inspection is proposed to be utilized for aging management.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.23 -3

The Periodic Surveillance and Preventative Maintenance Program is an existing program that covers a wide range of systems, structures, and components. The LRA states that the program includes periodic replacement or refurbishment of equipment based on operating experience. It is not clear whether equipment in scope of LR is subject to periodic replacement or refurbishment, or whether the equipment can perform its intended function at the time it is replaced or refurbished. Clarify whether any equipment that requires aging management per 10 CFR Part 54 is managed by periodic replacement or refurbishment, whether any inspections are performed in addition to the periodic replacement or refurbishment, the basis for the replacement or refurbishment period, and the equipment operating experience.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.23 -4

The LRA states that aging effects such as loss of material, cracking, loss of seal, etc., are detected by visual inspection of surfaces for evidence of leakage, material thinning, accumulation of corrosion products, and debris. Under Program Description and Scope of Program, the LRA states that the program uses "visual inspections and surface examinations" to detect aging effects, while Detection of Aging Effects only discusses visual examinations, and Monitoring and Trending describes the use of periodic plant walkdowns (which implies visual external inspections) for monitoring the aging effects. The staff notes that this program is primarily used to detect internal aging of such AERMs as loss of material and cracking due to SCC. Clarify the type of inspections that are used to detect each of the aging effects covered by this program, and discuss their applicability to the AERMs being managed.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.23 -5

The LRA states that the One-Time Inspection program (AMP B2.1.23) is used to verify the effectiveness of the Water Chemistry Control Program (AMP B2.1.37). The LRA further states that the One-Time Inspection Program is consistent with GALL Program XI.M32, "One-Time Inspection." A review of the LRA implies that the Periodic Surveillance and Periodic Maintenance Program is frequently used in lieu of the One-Time Inspection program for verifying the effectiveness of the Water Chemistry Control Program. Clarify whether the Periodic Surveillance and Periodic Maintenance Program is being used for this purpose and, if so, discuss whether the inspections are comparable to the inspections GALL Program XI.M32.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.23 -6

The LRA states that the inspection intervals are established to provide timely detection of degradation and are based on service environment as well as industry and plant-specific operating experience and manufacturers recommendations. In order to evaluate the acceptability of this program, the staff requires additional information on the frequency of inspections for the various AERMs covered by this program. Provide the inspection frequency for the various AERMs covered by this program.

Response: NRC staff to clarify question in final RAI.

D-RAI B2.1.23 -7

The LRA states that acceptance criteria for this program "will be developed." Discuss how the criteria will be developed for each applicable AERM, and how this criteria, coupled with the inspection frequency, will ensure that the components continue to meet their LR intended function.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.23 -8

Table 3.4-1, line number (2), indicates that the Periodic Surveillance and Preventive Maintenance Program will be used to address hardening, cracking, and loss of strength due to elastomer degradation for elastomers in the ventilation system. The LRA is unclear about how these items will be inspected. Describe the inspections that will be performed on the elastomers in the ventilation systems.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.23 -9

Table 3.4-1, line number (9), states that the Periodic Surveillance and Preventive Maintenance Program will be used to monitor for loss of neutron absorbing capacity and loss of material in neutron absorbing sheets in the spent fuel pool. The LRA is not clear how these items will be inspected. Describe the inspections that will be performed on the neutron absorbing sheets.

Response: Question to be combined with D-RAI B2.1.30 -3 in final RAI.

D-RAI B2.1.24 -1

The LRA indicates that the Protective Coatings Monitoring and Maintenance Program is not credited as a license renewal AMP, but has included a discussion of the 10 elements of an AMP “to demonstrate compliance with the resolution of generic safety issue (GSI) 191". After discussing the 10 elements the LRA concludes their Coatings Program is consistent with the GALL, but states the program is not credited for LR. GSI 191 is related to PWR sump clogging. Failed coatings are only one potential source of debris that could clog the sump. LR is not the correct forum for resolving GSIs.

The staff requests that the applicant clarify the intent of providing the discussion on the Protective Coatings Monitoring and Maintenance Program and GSI 191 in the License Renewal Application. The staff also requests that the applicant provides justification for not crediting the subject AMP as the degradation of coatings can lead to clogging of strainers and reduces flow through the sump/drain system. If the applicant relies on other programs for protective coating monitoring and maintenance, identify those programs and discuss its adequacy, particularly, in meeting the guidance provided in AMP XI.S8 of GALL.

Response: Question partially resolved (refer to Enclosure 3).

D-RAI B2.1.25 -1

Section B2.1.25 of the LRA indicates that the reactor head closure studs are fabricated from ASME SA-320 Grade L43 (AISI 4340) low-alloys steel and are not susceptible to stress corrosion cracking (specified minimum yield strength of 105 ksi).

a) Provide plant experience regarding the number and results of the inspections of the bolts.

b) The bolting is susceptible to SCC when heat treated to a maximum tensile strength limited greater than 1,172 MPa (170 ksi). Were any bolts heat treated to a tensile strength greater than170 ksi?

Response: RG&E indicated that the question is clear.

D-RAI B2.1.26 -1

For the Reactor Vessel Head Penetration Inspection AMP:

a) Describe in detail the parameters and criteria used in the susceptibility assessment for primary water stress corrosion cracking (PWSCC) to identify susceptible components.

b) Identify all the components that are within the scope of this program. Based on the susceptibility assessment, what components are determined to be not susceptible to PWSCC.

c) The reactor vessel head is planned to be replaced in 2003 with Alloy 690TT. Describe in detail the Alloy 690TT material regarding its chemical composition, heat-treatment, process of fabrication and its susceptibility to PWSCC. Also discuss the differences between Alloy 690TT and Alloy 690.

d) PWSCC is a time-dependent material degradation process and its initiation and growth depend on a number of factors such as susceptibility of materials, stress conditions, environmental condition and operational temperature. Even if there is no PWSCC found in the susceptible components in the first 40 years of operation, there is no assurance that PWSCC will not occur in the next 20 years unless it is adequately mitigated and periodically verified. Provide the bases for not performing augmented inspection such as volumetric and eddy current examinations of the bottom-mounted instrumentation penetrations to verify that PWSCC is not occurring in those components during the extended period of operation.

e) Discuss in detail the conclusion that the Ginna station ASME Section XI ISI program has been effective in maintaining the intended function of the current reactor vessel upper and lower head penetrations. The current industry experience did not support this conclusion. Describe in detail of the ASME Section XI ISI program implemented in Ginna station for reactor vessel upper and lower head penetrations particularly regarding the method and frequency of inspection and the capability of detecting the PWSCC when cracks in susceptible components are not yet through-wall.

f) At V. C. Summer plant, a through-wall crack was found on an Alloy 182/82 weld which was located at the Loop “A” reactor vessel hot leg nozzle to pipe weld joint. A destructive failure analysis was performed on the defective weld and the degradation mechanism was determined to be PWSCC. In view of the V. C. Summer event, there is a concern regarding the PWSCC of Alloy 182/82 weld materials in PWR environment. To ensure that the effect of PWSCC in all Alloy 182/82 components are adequately managed during the extended period of operation, provide the following information:

i) Provide a list of all components with Alloy 182/82 weld or buttering at Ginna Station.

ii) Describe the current inspection program implemented at Ginna station for components identified above including the inspection method/frequency and history of inspection results .

iii) Provide the bases that the existing programs implemented at Ginna station will provide adequate aging management of the PWSCC effect on the components with Alloy 182/82 weld or buttering. In the discussion of the adequacy of the program, the applicant should consider the following industrial experiences:

- The inspection performed in accordance with current ASME Section XI ISI program failed to identify the cracking

- There is no reported deviation from the EPRI guidelines in the water chemistry of the reactor coolant in V. C. Summer, Davis-Besse and other plants where PWSCC was found.

- The industry experiences have shown that early detection of small leakage from insulated welds can not be assured.

Response: Question to be clarified in final RAI. Question partially combined with D-RAI 3.2.2 -2.

<u>D-RAI B2.1.27 -1</u>

Section B2.1.27 of the LRA identifies the following reactor vessel internal components to be most susceptible to crack initiation and growth due to irradiation assisted stress corrosion cracking (IASCC) and loss of fracture toughness due to neutron irradiation embrittlement and/or void swelling:

- Lower core plate and fuel alignment pins;
- Lower support columns;
- Core barrel and core barrel flange in active core region;
- Thermal shield and neutron panels;
- Bolting - lower support column, baffle-former, and barrel former

Provide the criteria for choosing these locations.

Response: RG&E indicated that the question is clear.

<u>D-RAI B2.1.28 -1</u>

Section B2.1.28 of the LRA indicates that an additional capsule will be withdrawn at a neutron fluence equivalent to approximately 52 effective full power years (EFPY) of exposure.

a) Provide the neutron fluence expected to be received by this capsule when it is removed from the vessel at 52 EFPY.

b) Provide the expected calendar date at which time the capsule with be withdrawn.

c) Provide the lead factor for this capsule.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.29 -1

As stated in the LRA Section B2.1.29, the applicant has removed the hardness testing from its inspection program. The Selective Leaching Program in GALL identifies hardness measurements in addition to visual inspections as a method for determining whether there is a degradation of material on select components due to selective leaching. Hardness test measurements are helpful in evaluating degradation of material in a component due to leaching, where visual inspection may be ineffective. The LRA states that an assessment of the feasibility of performing hardness tests and the value of hardness data is made on a component specific basis. Therefore, the staff requests the applicant to justify the deviation from hardness testing and to describe how the applicant will determine if selective leaching is occurring without hardness measurements, particularly on the components where visual inspection cannot be effective. Additionally, the staff requests the applicant to provide more detailed criteria as to the assessment of determining the need for a hardness evaluation, and how the hardness testing will be performed.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.30 -1

The effectiveness of borated stainless steel to absorb neutrons depends on the amount of boron present. Describe how the amount of boron (areal density) in the coupons is determined from the measurements made during their inspections.

Response: Question resolved (refer to Enclosure 3).

D-RAI B2.1.30 -2

Explain how the areal density of boron in the full size neutron absorbing panel in the spent fuel racks is predicted from the amount of boron present in the coupons.

Response: Question resolved (refer to Enclosure 3).

D-RAI B2.1.30 -3

The existing evidence of the resistance of the neutron absorbing panels to degradation in the spent fuel pool environment is based on the results of one examination of a single coupon. What trending procedures are used for predicting that the neutron absorbers will perform their functions over the remaining life of the racks?

Response: Question to be combined with D-RAI B2.1.23 -9 in final RAI.

D-RAI B2.1.31 -1

The LRA states that the Steam Generator Tube Integrity (SGTI) AMP is credited for maintaining the integrity of the steam generator tubes and is consistent with XI.M19, "Steam Generator Tube Integrity," in the GALL report. However, Tables 3.2-1 and 3.2-2 identifies additional components for which the SGTI AMP (B2.1.31) is credited. In addition, the GALL report states that the scope of XI.M19 is specific to steam generator tubes.

a) Table 3.2-1, line number (2), "Steam Generator Shell Assembly", states that the aging effect for this component (i.e., loss of material due to pitting and crevice corrosion) is managed, in part, by the Steam Generator Tube Integrity Program (B2.1.31). It is not clear to the staff how the SGTI AMP manages this component and aging effect. The GALL report and the applicant's SGTI AMP state that the scope of XI.M19 is specific to steam generator tubes; therefore, provide details for the following attributes for this component: preventive actions; parameters monitored/inspected; detection of aging effects; monitoring and trending; and acceptance criteria. Ensure that your discussion identifies how the steam generator program manages this aging effect (e.g., the part of this component that is managed by the SGTI Program and how it is managed by the SGTI Program).

b) Table 3.2-1, line number (15), "(Alloy 600) steam generator tubes, repair sleeves, and plugs," states that the aging effects for these components are managed, in part, by the SGTI AMP (B2.1.31). The GALL report and the applicant's SGTI AMP state that the scope of XI.M19 is specific to steam generator tubes; therefore, provide details for the following attributes for the repair sleeves and plugs: preventive actions; parameters monitored/inspected; detection of aging effects; monitoring and trending; and acceptance criteria.

c) Table 3.2-2, line number (25), "SG Lattice Grid Tube Supports, U-Bend Fan Bar Restraints," states that the aging effect for these components is managed by the SGTI AMP (B2.1.31). The GALL report and the applicant's SGTI AMP state that the scope of XI.M19 is specific to steam generator tubes; therefore, provide details for the following attributes for this component: preventive actions; parameters monitored/inspected; detection of aging effects; monitoring and trending; and acceptance criteria.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.33 -1

The LRA states that the acceptance criteria for external corrosion will consider the design margin of the component being inspected. The staff notes that this program covers a wide variety of components, including metal expansion joints and pump bodies, that may have a wide range of design margin with respect to allowable corrosion. Provide additional information related to the acceptance criteria for the visual inspections with respect to how the design margin will be considered.

Response: RG&E indicated that the question is clear.

D-RAI B2.1.34 -1

The Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS) AMP is used to manage the loss of fracture toughness (embrittlement) in the CASS components in the reactor coolant system due to thermal aging. The LRA provides only a brief description of this program without a detailed discussion of the ten program elements/attributes as delineated in Appendix A of the Standard Review Plan (SRP), and also does not state whether this program is consistent with AMP XI.M12 in NUREG-1801. However, the staff notes that in line numbers (19) and (20) of Table 3.2.1, the subject program is credited with managing loss of fracture toughness in CASS pump casing and valve body and CASS piping due to thermal aging embrittlement. The credited management programs are described as consistent with NUREG-1801, "Generic Aging Lessons Learned (GALL) Report."

a) Discuss whether the subject AMP is consistent with the guidelines provided in AMP XI.M12, "Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS) of NUREG-1801. Also identify all deviations from the guidelines in AMP XI.M12 and provide justification for each deviation.

b) Provide a list of all components that are fabricated from CASS.

c) Identify components from the above list that are within the scope of this program.

d) Provide bases for those CASS components that are not within the scope of this program.

e) Provide the service experience, previous inspection and leakage test results of CASS components at Ginna.

f) Provide the industry-wide service experience of CASS components.

Response: NRC staff to clarify question in final RAI.

D-RAI B2.1.36 -1

Section B2.1.36 of the LRA indicates that eddy current examinations are performed on a periodicity consistent with the severity of wear damage for each thimble tube. When wall loss in a tube exceeds 55%, but less than 65%, the tube is repositioned such that wear is redistributed, or other corrective action is taken.

Based on the results of a plant-specific analysis, examination results are compared to an upper allowable limit of 65% through-wall wear.

Eddy current examinations performed in 1988, 1989, 1990, 1991, and 1992 provided a basis for establishing the wear rates, and thus the inspection intervals, for thimble tubes. Based on those results, the inspection frequency and acceptance criteria are:

- Previous indication 10% to less than 45% - every third refueling outage (approximately once every 4.2 years)

- Previous indication 45% to less than 55% - every other refueling outage (approximately once every 3 years)

previous indication 55% or greater - perform corrective action, if support plate wear is the suspected cause. For other indications, corrective action will be taken at 65% or greater. Future inspection frequency will be every other or every third outage, as stated above. previous inspection never exceeded 10% through-wall - no specified frequency. Future inspections will be based on a Ginna Station periodic assessment.

a) Provide the data, analysis, and the wear rate that was determined from the 1988 through 1992 inspections. Based on this analysis, how were the inspection intervals determined?

b) Provide the results (the amount of wear observed) from all inspection performed after 1992 and identify whether the amount of wear exceeded the amount identified in question a).

c) How will the applicant evaluate future inspection results to determine their impact on the inspection frequency of thimble tubes during the license renewal period?

Response: RG&E indicated that the question is clear.

<u>D-RAI B2.1.37 -1</u>

In Section B2.1.37, “Water Chemistry Control Program,” of the LRA, it specifies a one-time inspection for only those components exposed to low flow or stagnant water. The components exposed to high velocity water were excluded from the one-time inspection. Explain the rationale for excluding these components which, in some instances, may also be exposed to degradation mechanisms.

Response: RG&E indicated that the question is clear.

<u>D- RAI B3.3 -1</u>

In the operating experience element of Section B3.3, “Concrete Containment Tendon Prestress,” it indicates that 23 tendons out of 160 tendons were retensioned 1000 hours after initial prestressing. It is not clear if the 23 tendons retensioned after initial prestressing were parts of the randomly selected tendons in the subsequent surveillance of tendons performed as per Regulatory Guide 1.35, or IWL-2520. The applicant is requested to provide information regarding the trending of prestressing forces in these 23 tendons

Response: Combine with D-RAI 4.5 -1 in final RAI.

MEETING WITH ROCHESTER GAS AND ELECTRIC CORPORATION (RG&E)
R.E. GINNA
LICENSE RENEWAL APPLICATION
DRAFT REQUESTS FOR ADDITIONAL INFORMATION

FEBRUARY 3 AND 4, 2003

During the February 3 and 4, 2003, meetings with representatives of RG&E, the NRC staff (the staff) discussed draft requests for additional information (D-RAIs) it had prepared for the R. E. Ginna (Ginna) license renewal application (LRA). The following D-RAIs were resolved during the call and will not be issued as a final RAI to the applicant because the information was in the LRA or other docketed material.

D-RAI 3.2.1 -3

Table 3.2-1 of the application for renewed operating license, component (20), cast austenitic stainless steel (CASS), of the reactor coolant system piping indicates that the fittings (elbows) are CASS (Type CF8M).

Will CASS elbows be evaluated according to the NRC May 19, 2000, letter on CASS (Licencee Renewal Issue No. 98-0030, “Thermal Aging and Embrittlement of Cast Austenitic Stainless Steel Components”)? If they will not be evaluated in accordance with the NRC May 19, 2000, letter, provide a plant specific program.

Resolution: The information requested by the staff is contained in table 2.3.1-1 under the component group “primary loop elbows,” which references table 3.2-1 line numbers (10) and (20). Line numbers (10) and (20) reference TLAA “thermal aging of cast austenitic stainless steel on page 4-68 of the LRA.

D-RAI 3.2.2 -4

Table 3.2-2 of the LRA, component (14), RCS valves, credits water chemistry for managing the effects of SCC. The staff believes that water chemistry will mitigate the effects of SCC; however, to ensure that cracking does not result in failure of the valves, the applicant is requested to provide an inspection program to monitor SCC in the valves or justify why an inspection program is not required.

Resolution: The information requested by the staff is contained in table 3.2.-2 on page 3-68 of the LRA. Table 3.2-2 line number (13) credits the ISI program for RCS valves. Both line numbers (13) and (14) apply to RCS valves.

D-RAI 3.3 -2

LRA Section B2.1.21, “One Time Inspection”, states that the Ginna Station One-Time Inspection Program will include measures to verify the effectiveness of an existing AMP and confirm the absence of an aging effect. In LRA Table 3.3-2, line numbers (25), (30), (36), (41), (42), (52), (55), (63), (66), (76), (78), (80), (82), and (95), for components in treated water or treated water other environments, no existing AMPs were credited for managing the aging effect of loss of material, prior to the use of the supplemental One-Time Inspection Program. Discuss this potential program deficiency.

Resolution: Question partially resolved. The information requested by the staff for line numbers (30), (36), (52), (55), (63), (76), (78) (80), (82), and (95) is contained in table 3.3-2 on page 3-63. The applicant stated that component, material and environment combinations may have more than one line entree. These component groupings also reference line numbers (31), (37), (53), (56), (64), (77), (79) (81), (83), and (96) which credits the Water Chemistry Control Program for managing aging.

<u>D-RAI 3.3 -3</u>

LRA Table 3.3-2, line numbers (53), (64), (83), and (96), lists Water Chemistry Control Program as the AMP to manage the aging effect of loss of material for the pipe, tank, and valve body made of stainless; as well as the valve body made of case austenitic stainless steel, which are exposed to treated water-other (stagnant) environments. In view of the potential slow and stagnant flow conditions, the applicant is requested to discuss the basis for not supplementing the above program with a one-time inspection program, for the verification of the effectiveness of the Water Chemistry Control Program. Clarify also that for line numbers (28), (31), (37), (56), (77), (79), and (81), the Water Chemistry Control Program alone will indeed be adequate in managing the identified aging effects for the various material/environment combinations.

Resolution: Question partially resolved. The information requested by the staff for line numbers (53), (64), (83), and (96) is contained in table 3.3-2 on page 3-63. The applicant stated that component, material and environment combinations may have more than one line entree. These component groupings also reference line numbers (52), (63), (82), and (95) which credits the One-Time Inspection Program for managing aging.

The information requested by the staff for line numbers (31), (37), (56), (77), (79) and (81) is contained in table 3.3-2 on page 3-63. The applicant stated that component, material and environment combinations may have more than one line entree. These component groupings also reference line numbers (30), (36), (55), (76), (78) and (80) which credits the One-Time Inspection Program for managing aging.

<u>D-RAI 3.4 -9</u>

LRA Section B2.1.21, “One Time Inspection”, states that the Ginna Station One-Time Inspection Program will include measures to verify the effectiveness of an existing AMP and confirm the absence of an aging effect. In LRA Table 3.4-2, at various line numbers, the applicant properly uses the One-Time Inspection Program to verify the effectiveness of an existing program, such as Water Chemistry Control Program. In other cases, such as line numbers (363), (388), (395), and (438); however, the applicant simply proposed to use the One-Time Inspection Program to manage loss of material, without committing to an existing AMP. This practice may not be supported by industry experience, as one-time inspection alone may not be sufficient for an early detection of material degradation during the extended period of operation. Provide the basis of not utilizing an existing AMP prior to the supplemental One-Time Inspection Program, for the components included in the above stated line numbers.

Resolution: Question partially resolved. The information requested by the staff for line numbers (363), (388), and (438) is contained in table 3.3-2 on page 3-63. The applicant stated that component, material and environment combinations may have more than one line entree. These component groupings also reference line numbers (364), (389), and (439) which credits the Periodic Surveillance and Preventive Maintenance Program for managing aging. Line number (388) also credits line number (390) which references the Water Chemistry Program for managing aging.

D-RAI 3.4 -10

LRA Table 3.4-2, line numbers (390), (399), (401), (403), (406), (408), (410), (412), (453), (455), (457), (461), (463), (465), and (467), uses the Water Chemistry Control Program to manage the aging effect of loss of material for the valve bodies which are made of carbon/low alloy steel, cast austenitic stainless steel, and stainless steel materials from exposure to treated water borated, treated water primary, or treated water other (stagnant) environments. In none of these cases did the applicant use One-Time Inspection Program to supplement or verify the effectiveness of the Water Chemistry Control Program in managing the aging effect. Provide the basis of not doing so, especially in view of the potential slow and stagnant flow condition for the environments of line numbers (390), (406), and (461), under which some specific locations in components may be more susceptible to corrosion.

Resolution: The information requested by the staff is contained in table 3.3-2 on page 3-63. The applicant stated that component, material and environment combinations may have more than one line entree. These component groupings also reference line numbers (388), (389), (398), (400), (402), (405), (407), (409), (411), (452), (454), (456), (459), (460), (462), (464), and (466) which credits the Periodic Surveillance and Preventive Maintenance Program and/or the One-Time Inspection Program for managing aging.

D-RAI 3.4.9 -2

a) LRA Table 3.4-2, line number (34), identifies loss of material as the aging effect for copper alloy (Zn < 15 %) cooling coil that are exposed to air and gas (wetted)<140 degree F and credited One-Time Inspection Program for managing the aging effect. However, the staff noted that the scope of the One-Time Inspection Program as described on Pages B-38 and -39 of the LRA does not include components that are exposed to air and gas. Clarify this discrepancy.

b) The staff also noted that in LRA table 3.4-2, line number (35), identifies the loss of material as aging effect for copper alloy (Zn < 15 %) cooling coil that are exposed to air and gas (wetted)<140 degree F and credited the Periodic Surveillance and Preventive Maintenance Program for managing the aging effect. Clarify whether both the One-Time Inspection Program and the Periodic Surveillance and Preventive Maintenance Program are used for managing the aging effect of loss of material for the same component. If only one of these two programs is credited for any single component, justify why One-Time Inspection alone is adequate to manage the aging effects including a discussion of the plant specific operating experience related to the component of concern to support your conclusion. Similarly, address the above staff's concerns for the heat exchanger included in Table 3.4-2, lines number (124) and (125).

Resolution: Question partially resolved. Question b) - The information requested by the staff for line number (35) is contained in table 3.3-2 on page 3-63. The applicant stated that component, material and environment combinations may have more than one line entree. This component groupings also references line number (34) which credits the One-Time Inspection Program for managing aging. Both the One-Time Inspection Program and the Periodic Surveillance and Preventive Maintenance Program are used for managing the aging effect of loss of material.

The LRA is correct for table 3.4-2, line numbers (124) and (125). Both line numbers apply, the applicant stated that component, material and environment combinations may have more than one line entree.

D-RAI 3.4.9 -3

LRA Table 3.4-2, line number (134), identifies loss of heat transfer as aging effect for HX-copper alloy (Zn < 15 %) heat exchanger that are exposed to raw water and credited the Open-Cycle Cooling Water System Program for managing the aging effect. The staff also noted that in LRA Table 3.4-2, line number (135), identifies loss of heat transfer as aging effect for HX-copper alloy (Zn < 15 %) heat exchanger that are exposed to raw water and credited the Periodic Surveillance and Preventive Maintenance Program for managing the aging effect. Clarify whether both the Open-Cycle Cooling Water System Program and the Periodic Surveillance and Preventive Maintenance Program are used for managing the aging effect of the same component. If only one of these two programs is credited for any single component, clarify how each program is utilized to manage the aging effect for the component included in table 3.4-2, line numbers (134) and (135).

Resolution: The LRA is correct for table 3.4-2, line numbers (134) and (135). The applicant stated that component, material and environment combinations may have more than one line entree. Both the Open-Cycle Cooling Water System Program and the Periodic Surveillance and Preventive Maintenance Program are used for managing the aging effect of the same component.

D-RAI 3.4.12 -1

LRA Table 3.4.-2, line numbers (257), (265) and (434), identifies the loss of material as aging effect/mechanism for aluminum, cast iron, or copper alloy components in raw water drainage environment in the treaded water System. It further indicates that the applicable AMP is the One-Time Inspection Program (AMP B.2.1.21). However, the One-Time Inspection Program is used to determine whether the loss of material, due to selective leaching for aluminum, cast iron or brass components, represents significant aging effects that require aging management. Justify why the One-Time Inspection alone is adequate to manage the aging effect including a discussion of the plant specific operating experience related to the components of concern to support its conclusion.

Resolution: Question partially resolved. The information requested by the staff for line number (257) is contained in table 3.3-2 on page 3-63. The applicant stated that component, material and environment combinations may have more than one line entree. This component groupings also references line number (258) which credits the Periodic Surveillance and Preventive Maintenance Program for managing aging.

D-RAI 3.5 -5

Loss of material due to general corrosion could occur on the external surfaces of all carbon steel structures and components, including closure boltings, exposed to operating temperature less than 212°F. Such corrosion may be due to air, moisture, or humidity. The applicant must provide reasonable assurance that these aging effects are adequately managed. In Table 3.5-1, line number (5) of the LRA for loss of material for the external surface of carbon steel components, the applicant states, “Consistent with NUREG-1801. The System Monitoring Program is credited with managing the aging effect loss of material due to general corrosion on the external surfaces of carbon steel components.” Since NUREG-1801 does not contain an approved AMP for loss of material due to general corrosion on the external surfaces of carbon steel components, explain how the AMP is consistent with NUREG-1801. Also, the Periodic Surveillance and Preventive Maintenance Program does not specifically identify inspection of all carbon steel structures and components, including closure boltings, exposed to operating temperature less than 212°F that are in an air, moisture, or humidity environment. The staff requests the applicant identify if the System Monitoring Program manages loss of material due to general corrosion of all carbon steel structures and components, including closure boltings, exposed to operating temperature less than 212°F that are in an air, moisture, or humidity environment. If the System Monitoring Program does not monitor these aging effects for carbon steel structures, components, and bolting, please identify how these aging effects are managed.

Resolution: Question partially resolved. The information requested by the staff is contained in section B2.1.33.1 on page B-70 of the LRA under the scope of the systems monitoring program.

D-RAI 3.5 -14

a) LRA Table 3.5-2, line numbers (24), (28), and (58), identifies that there are no aging effects for carbon/low alloy steel components in an air and gas environment. In Table 3.5-2, line number (29), it identifies the One-Time Inspection Program as managing loss of material for carbon/low alloy steel components in a wetted air and gas environment less than 140°F. What criteria is used to distinguish a wetted air and gas environment from an air and gas environment?

b) A one-time inspection can be used to address concerns for the potential long incubation period for certain aging effects on structures and components. There are cases where either (a) an aging effect is not expected to occur, but there is insufficient data to completely rule it out, or (b) an aging effect is expected to progress very slowly. For these cases, there is to be confirmation (by one-time inspection) that either the aging effect is indeed not occurring, or the aging effect is occurring very slowly as not to affect the component or structure intended function. Based on these guidelines, provide operating experience to demonstrate that the aging effect is not expected to occur or is expected to progress very slowly the pipe identified in Table 3.5-2, line number (29).

Resolution: Question partially resolved. Question b) - The information requested by the staff is contained in Table 3.1-1 on page 3-10 of the LRA.

D-RAI 3.6 -1

Section 1.5.2 of the LRA provides “Passive Function Code Definitions.” One of definition is “Pressure Boundary Structure - Provide Pressure Boundary or Essentially Leak Tight Barrier to Protect Public Health and Safety in the Event of Any Postulated Design Basis Event.” The applicant is requested to provide information as to why this definition is not applicable for the Ginna containment intended functions in Section 2.4.1 under “System Function Listing,” and in line number (1) of Table 3.6.0-1 (WCAP-14756-A).

Resolution: Section 2.4.1 of the LRA, under “System Function Listing,” identifies the containment function as system function code K, provide primary containment boundary. Table 2.1.1 defines system function code K as “This function addresses any primary containment fission product barrier or primary containment radioactive material holdup or isolation.”

D-RAI B2.1.1 -1

The Aboveground Carbon Steel Tanks AMP is not specifically used for aging management at Ginna station as it is implemented by the Systems Monitoring and One-Time Inspection Programs.

a) Provide a list of all aboveground carbon steel tanks that are within the scope of LRA including a description of the content inside the tank and the storage condition such as temperature and pressure. Also provide justification for not inspecting the interior tank surface.

b) Identify the aboveground carbon steel tanks that are not within the scope of this program and provide the justification for not including those tanks into the scope of this program.

c) The staff notes that a one-time inspection of the reactor makeup water tank prior to the period of extended operation will be performed for tank bottom thickness measurements. Please provide justification for not performing one-time inspection on the other aboveground carbon steel tanks.

d) The staff notes that the bottom thickness measurement of the aboveground carbon steel tanks are not identified in the scope of program for the one-time inspection program. Since the subject program will not be specifically used for aging management at Ginna station, the performance of bottom thickness measurement of the aboveground carbon steel tanks should be identified in the scope of the One-Time Inspection Program. If not, provide the justification for its exclusion.

e) Does this program provide guidance for the selection of locations with the highest likelihood of corrosion problems for thickness measurements, such as the locations where there is observed degradation of sealant or caulking at the interface edge between the tank and foundation which would allow penetration of water and moisture and cause corrosion of the bottom surface?

f) Provide guidance in this programs for sample expansion and increasing frequency of inspection when surface degradation is observed.

g) Discuss the bases for not monitoring/inspection the potential corrosion or degradation of the internal surfaces of the buried piping and tanks.

Resolution: Question partially resolved. For questions (a) and (b) - the information requested by the staff is contained in the LRA Sections 2.3 and 2.4 and as depicted on the plant drawings. Question (g) combined with question D-RAI B2.1.7 -1.

D-RAI B2.1.24 -1

The LRA indicates that the Protective Coatings Monitoring and Maintenance Program is not credited as a license renewal AMP, but has included a discussion of the 10 elements of an AMP “to demonstrate compliance with the resolution of generic safety issue (GSI) 191". After discussing the 10 elements the LRA concludes their Coatings Program is consistent with the GALL, but states the program is not credited for LR. GSI 191 is related to PWR sump clogging. Failed coatings are only one potential source of debris that could clog the sump. LR is not the correct forum for resolving GSIs.

The staff requests that the applicant clarify the intent of providing the discussion on the Protective Coatings Monitoring and Maintenance Program and GSI 191 in the License Renewal Application. The staff also requests that the applicant provides justification for not crediting the subject AMP as the degradation of coatings can lead to clogging of strainers and reduces flow through the sump/drain system. If the applicant relies on other programs for protective coating monitoring and maintenance, identify those programs and discuss its adequacy, particularly, in meeting the guidance provided in AMP XI.S8 of GALL.

Resolution: Question partially resolved. The applicant stated that the programs utilized for coatings of internal surfaces are the Structures Monitoring Program and the Systems Monitoring Programs. The information on these programs is contained in section B2.1.32 and B2.1.33 on page B-68 of the LRA.

D-RAI B2.1.30 -1

The effectiveness of borated stainless steel to absorb neutrons depends on the amount of boron present. Describe how the amount of boron (areal density) in the coupons is determined from the measurements made during their inspections.

Resolution: The information requested by the staff is contained in the letter form G.S. Vissing, NRC, to R. C. Mecredy, RG&E, Subject: Issuance of Amendment No. 72 to Facility Operating License No. DPR-18, dated July 30, 1998.

D-RAI B2.1.30 -2

Explain how the areal density of boron in the full size neutron absorbing panel in the spent fuel racks is predicted from the amount of boron present in the coupons.

Resolution: The information requested by the staff is contained in the letter form G.S. Vissing, NRC, to R. C. Mecredy, RG&E, Subject: Issuance of Amendment No. 72 to Facility Operating License No. DPR-18, dated July 30, 1998.

R. E. GINNA NUCLEAR POWER PLANT
LICENSE RENEWAL APPLICATION
REQUEST FOR ADDITIONAL INFORMATION MATRIX

DRAFT RAI	**RESOLUTION**	**FINAL RAI #**
D-RAI 2.1 -1	OK	F-RAI 2.1 -1
D-RAI 2.1 -2	OK	F-RAI 2.1 -2
D-RAI 2.1 -3	OK	F-RAI 2.1 -3
D-RAI 2.1 -4	Clarified	F-RAI 2.1 -4
D-RAI 2.1 -5	OK	F-RAI 2.1 -5
D-RAI 2.1 -6	OK	F-RAI 2.1 -6
D-RAI 2.2 -1	OK	F-RAI 2.2 -1
D-RAI 2.3 -1	OK	F-RAI 2.3 -1
D-RAI 2.3 -2	OK	F-RAI 2.3 -2
D-RAI 2.3 -3	Resolved (1/15/03)	N/A
	Combined D-RAI HVAC -4 & D-RAI 2.3.3.9 -1	F-RAI 2.3 -3
D-RAI 2.3.1 -1	Resolved (1/15/03)	N/A
D-RAI 2.3.1 -2	OK	F-RAI 2.3.1 -1
D-RAI 2.3.1 -3	OK	F-RAI 2.3.1 -2
D-RAI 2.3.1 -4	Resolved (1/15/03)	N/A
D-RAI 2.3.1 -5	Resolved (1/15/03)	N/A
2.3.2.1	(None)	(None)
2.3.2.2	(None)	(None)
D-RAI 2.3.2.3 -1	OK	F-RAI 2.3.2.3 -1
D-RAI 2.3.2.4 -1	OK	F-RAI 2.3.2.4 -1
D-RAI 2.3.2.4 -2	OK	F-RAI 2.3.2.4 -2
D-RAI 2.3.2.4 -3	OK	F-RAI 2.3.2.4 -3
D-RAI 2.3.2.4 -4	Resolved (11/26/02)	N/A

D-RAI 2.3.2.5 -1	OK	F-RAI 2.3.2.5 -1
D-RAI 2.3.2.5 -2	Clarified	F-RAI 2.3.2.5 -2
2.3.3.1	(None)	(None)
D-RAI 2.3.3.2 -1	Resolved (11/26/02)	N/A
D-RAI 2.3.3.2 -2	OK	F-RAI 2.3.3.2 -1
D-RAI 2.3.3.2 -3	OK	F-RAI 2.3.3.2 -2
D-RAI 2.3.3.3 -1	OK	F-RAI 2.3.3.3 -1
D-RAI 2.3.3.3 -2	OK	F-RAI 2.3.3.3 -2
	New	F-RAI 2.3.3.3 -3
	New	F-RAI 2.3.3.3 -4
D-RAI 2.3.3.4 -1	Resolved (11/26/02)	N/A
D-RAI 2.3.3.4 -2	Resolved (1/15/03)	N/A
	New	F-RAI 2.3.3.4 -1
D-RAI 2.3.3.5 -1	OK	F-RAI 2.3.3.5 -1
D-RAI 2.3.3.5 -2	OK	F-RAI 2.3.3.5 -2
D-RAI 2.3.3.5 -3a, -3b, -3c, -3d	Partially resolved (11/26/02)	F-RAI 2.3.3.5 -3
D-RAI 2.3.3.5 -4	Resolved (11/26/02)	N/A
D-RAI 2.3.3.5 -5	OK	F-RAI 2.3.3.5 -4
D-RAI 2.3.3.5 -6	OK	F-RAI 2.3.3.5 -5
D-RAI 2.3.3.6 -1	OK	F-RAI 2.3.3.6 -1
D-RAI 2.3.3.6 -2	OK	F-RAI 2.3.3.6 -2
D-RAI 2.3.3.6 -3	OK	F-RAI 2.3.3.6 -3
D-RAI 2.3.3.6 -4	OK	F-RAI 2.3.3.6 -4
D-RAI 2.3.3.7 -1	OK	F-RAI 2.3.3.7 -1
D-RAI 2.3.3.8 -1	Resolved (11/26/02)	N/A
D-RAI 2.3.3.8 -2	Resolved (11/26/02)	N/A
D-RAI 2.3.3.8 -3	OK	F-RAI 2.3.3.8 -1
D-RAI 2.3.3.8 -4	OK	F-RAI 2.3.3.8 -2

D-RAI 2.3.3.8 -5	Resolved (11/26/02)	N/A
D-RAI 2.3.3.8 -6	Resolved (1/15/03)	N/A
D-RAI HVAC -1	Resolved (1/15/03)	N/A
D-RAI HVAC -2	Resolved (1/15/03)	N/A
D-RAI HVAC -3	OK	F-RAI HVAC -1
D-RAI HVAC -4	Combined w/D-RAI 2.3.3.9 -1	F-RAI 2.3 -3
D-RAI HVAC -5	OK	F-RAI HVAC -2
D-RAI HVAC -6	Resolved (1/15/03)	N/A
D-RAI 2.3.3.9 -1	Combined with D-RAI HVAC -4	F-RAI 2.3 -3
D-RAI 2.3.3.9 -2	Resolved (1/15/03)	N/A
D-RAI 2.3.3.9 -3	OK	F-RAI 2.3.3.9 -1
D-RAI 2.3.3.10 -1	Clarified	F-RAI 2.3.3.10 -1
D-RAI 2.3.3.10 -2	Resolved (1/15/03)	N/A
D-RAI 2.3.3.10 -3	OK	F-RAI 2.3.3.10 -2
D-RAI 2.3.3.10 -4	Clarified	F-RAI 2.3.3.10 -3
D-RAI 2.3.3.10 -5	OK	F-RAI 2.3.3.10 -4
D-RAI 2.3.3.11 -1	OK	F-RAI 2.3.3.11 -1
D-RAI 2.3.3.11 -2	OK	F-RAI 2.3.3.11 -2
D-RAI 2.3.3.12 -1	OK	F-RAI 2.3.3.12 -1
D-RAI 2.3.3.12 -2	Resolved (1/15/03)	N/A
D-RAI 2.3.3.12 -3	Clarified	F-RAI 2.3.3.12 -2
D-RAI 2.3.3.13 -1	OK	F-RAI 2.3.3.13 -1
D-RAI 2.3.3.13 -2	OK	F-RAI 2.3.3.13 -2
D-RAI 2.3.3.13 -3	OK	F-RAI 2.3.3.13 -3
D-RAI 2.3.3.14 -1	Resolved (1/15/03)	N/A
D-RAI 2.3.3.15 -1	OK	F-RAI 2.3.3.15 -1
D-RAI 2.3.3.16 -1	OK	F-RAI 2.3.3.16 -1
2.3.3.17	(None)	(None)

2.3.3.18	(None)	(None)
2.3.3.19	(None)	(None)
2.3.3.20	(None)	(None)
D-RAI 2.3.4.1 -1	OK	F-RAI 2.3.4.1 -1
D-RAI 2.3.4.1 -2	OK	F-RAI 2.3.4.1 -2
D-RAI 2.3.4.1 -3	OK	F-RAI 2.3.4.1 -3
D-RAI 2.3.4.1 -4	OK	F-RAI 2.3.4.1 -4
D-RAI 2.3.4.1 -5	OK	F-RAI 2.3.4.1 -5
D-RAI 2.3.4.1 -6	OK	F-RAI 2.3.4.1 -6
D-RAI 2.3.4.2 -1	OK	F-RAI 2.3.4.2 -1
D-RAI 2.3.4.2 -2	Resolved (1/15/03)	N/A
D-RAI 2.3.4.2 -3	OK	F-RAI 2.3.4.2 -2
D-RAI 2.3.4.3 -1	Resolved (1/15/03)	N/A
D-RAI 2.3.4.3 -2	OK	F-RAI 2.3.4.3 -1
D-RAI 2.3.4.3 -3	OK	F-RAI 2.3.4.3 -2
D-RAI 2.3.4.3 -4	OK	F-RAI 2.3.4.3 -3
D-RAI 2.3.4.3 -5	Resolved (1/15/03)	N/A
D-RAI 2.3.4.3 -6	OK	F-RAI 2.3.4.3 -4
D-RAI 2.3.4.3 -7	OK	F-RAI 2.3.4.3 -5
D-RAI 2.3.4.3 -8	Resolved (1/15/03)	N/A
D-RAI 2.3.4.3 -9	Resolved (1/15/03)	N/A
D-RAI 2.3.4.3 -10	OK	F-RAI 2.3.4.3 -6
D-RAI 2.3.4.4 -1	OK	F-RAI 2.3.4.4 -1
D-RAI 2.4 -1	OK	F-RAI 2.4 -1
D-RAI 2.4 -2	OK	F-RAI 2.4 -2
D-RAI 2.4 -3	OK	F-RAI 2.4 -3
D-RAI 2.4 -4	OK	F-RAI 2.4 -4
D-RAI 2.4 -5	OK	F-RAI 2.4 -5

D-RAI 2.5 -1	Combined with D-RAI 3.7 -2	F-RAI 2.5 -1
D-RAI 2.5 -2	OK	F-RAI 2.5 -2
D-RAI 2.5 -3	Clarified	F-RAI 2.5 -3
3.0	New	F-RAI 3.0 -1
3.1.2	New	F-RAI 3.1.2 -1
	New	F-RAI 3.1.2 -2
	New	F-RAI 3.1.2 -3
D-RAI 3.2.1 -1	OK	F-RAI 3.2.1 -1
D-RAI 3.2.1 -2	Clarified	F-RAI 3.2.1 -2
D-RAI 3.2.1 -3	Resolved (2/3/03)	N/A
D-RAI 3.2.2 -1	OK	F-RAI 3.2.2 -1
D-RAI 3.2.2 -2	Combined w/ D-RAI B2.1.26 -1	F-RAI 3.2.2 -2
D-RAI 3.2.2 -3	OK	F-RAI 3.2.2 -3
D-RAI 3.2.2 -4	Resolved (2/3/03)	N/A
D-RAI 3.2.2 -5	OK	F-RAI 3.2.2 -4
D-RAI 3.2.2 -6	OK	F-RAI 3.2.2 -5
D-RAI 3.3 -1	OK	F-RAI 3.3 -1
D-RAI 3.3 -2	Partially resolved (2/3/03)	F-RAI 3.3 -2
D-RAI 3.3 -3	Partially resolved (2/3/03)	F-RAI 3.3 -3
D-RAI 3.3 -4	Combined w/D-RAI 3.4.1 -3	F-RAI 3.3 -4
D-RAI 3.3 -5	Combined w/D-RAI 3.4.5 -1	F-RAI 3.3 -5
D-RAI 3.3 -6	OK	F-RAI 3.3 -6
D-RAI 3.4 -1	Resolved (1/15/03)	N/A
D-RAI 3.4 -2	Resolved (1/15/03)	N/A
D-RAI 3.4 -3	OK	F-RAI 3.4 -1
D-RAI 3.4 -4	OK	F-RAI 3.4 -2
D-RAI 3.4 -5	Clarified	F-RAI 3.4 -3
D-RAI 3.4 -6	OK	F-RAI 3.4 -4

D-RAI 3.4 -7	OK	F-RAI 3.4 -5
D-RAI 3.4 -8	OK	F-RAI 3.4 -6
D-RAI 3.4 -9	Partially resolved (2/3/03)	F-RAI 3.4 -7
D-RAI 3.4 -10	Resolved (2/3/03)	N/A
D-RAI 3.4.1 -1	OK	F-RAI 3.4.1 -1
D-RAI 3.4.1 -2	OK	F-RAI 3.4.1 -2
D-RAI 3.4.1 -3	Combined with D-RAI 3.3 -4	F-RAI 3.3 -4
D-RAI 3.4.2 -1	OK	F-RAI 3.4.2 -1
D-RAI 3.4.3 -1	Combined with D-RAI 3.4.7 -1	F-RAI 3.4.3 -1
D-RAI 3.4.4 -1	OK	F-RAI 3.4.4 -1
D-RAI 3.4.4 -2	OK	F-RAI 3.4.4 -2
D-RAI 3.4.5 -1	Combined with D-RAI 3.3 -5	F-RAI 3.3 -5
D-RAI 3.4.7 -1	Combined with D-RAI 3.4.3 -1	F-RAI 3.4.3 -1
D-RAI 3.4.8 -1	OK	F-RAI 3.4.8 -1
D-RAI 3.4.8 -2	OK	F-RAI 3.4.8 -2
D-RAI 3.4.9 -1	OK	F-RAI 3.4.9 -1
D-RAI 3.4.9 -2	Partially resolved (2/3/03)	F-RAI 3.4.9 -2
D-RAI 3.4.9 -3	Resolved (2/3/03)	N/A
D-RAI 3.4.10 -1	OK	F-RAI 3.4.10 -1
D-RAI 3.4.11 -1	OK	F-RAI 3.4.11 -1
D-RAI 3.4.12 -1	Partially resolved (2/3/03)	F-RAI 3.4.12 -1
D-RAI 3.4.12 -2	OK	F-RAI 3.4.12 -2
D-RAI 3.5 -1	OK	F-RAI 3.5 -1
D-RAI 3.5 -2	Clarified	F-RAI 3.5 -2
D-RAI 3.5 -3	OK	F-RAI 3.5 -3
D-RAI 3.5 -4	Combined with D-RAI 3.5 -11 & -13	F-RAI 3.5 -4
D-RAI 3.5 -5	Partially resolved (2/3/03)	F-RAI 3.5 -5
D-RAI 3.5 -6	OK	F-RAI 3.5 -6

D-RAI 3.5 -7	OK	F-RAI 3.5 -7
D-RAI 3.5 -8	Clarified	F-RAI 3.5 -8
D-RAI 3.5 -9	OK	F-RAI 3.5 -9
D-RAI 3.5 -10	Clarified	F-RAI 3.5 -10
D-RAI 3.5 -11	Combined with D-RAI 3.5 -4 & -13	F-RAI 3.5 -4
D-RAI 3.5 -12	OK	F-RAI 3.5 -11
D-RAI 3.5 -13	Combined with D-RAI 3.5 -4 & -11	F-RAI 3.5 -4
D-RAI 3.5 -14	Partially resolved (2/3/03)	F-RAI 3.5 -12
D-RAI 3.6 -1	Resolved (2/3/03)	N/A
D-RAI 3.6 -2	OK	F-RAI 3.6 -1
D-RAI 3.6 -3	OK	F-RAI 3.6 -2
D-RAI 3.6 -4	OK	F-RAI 3.6 -3
D-RAI 3.6 -5	OK	F-RAI 3.6 -4
D-RAI 3.6 -6	Clarified	F-RAI 3.6 -5
D-RAI 3.6 -7	OK	F-RAI 3.6 -6
D-RAI 3.6 -8	OK	F-RAI 3.6 -7
D-RAI 3.6 -9	OK	F-RAI 3.6 -8
D-RAI 3.6 -10	OK	F-RAI 3.6 -9
D-RAI 3.6 -11	OK	F-RAI 3.6 -10
D-RAI 3.6 -12	OK	F-RAI 3.6 -11
D-RAI 3.6 -13	OK	F-RAI 3.6 -12
D-RAI 3.6 -14	OK	F-RAI 3.6 -13
D-RAI 3.6 -15	OK	F-RAI 3.6 -14
D-RAI 3.6 -16	OK	F-RAI 3.6 -15
	New	F-RAI 3.6 -16
D-RAI 3.7 -1	OK	F-RAI 3.7 -1
D-RAI 3.7 -2	Combined with D-RAI 2.5 -1	F-RAI 2.5 -1

D-RAI 3.7 -3	Combined with D-RAI 3.7 -12	F-RAI 3.7 -2
D-RAI 3.7 -4	Resolved (1/15/03)	N/A
D-RAI 3.7 -5	Clarified	F-RAI 3.7 -3
D-RAI 3.7 -6	OK	F-RAI 3.7 -4
D-RAI 3.7 -7	OK	F-RAI 3.7 -5
D-RAI 3.7 -8	OK	F-RAI 3.7 -6
D-RAI 3.7 -9	OK	F-RAI 3.7 -7
D-RAI 3.7 -10	OK	F-RAI 3.7 -8
D-RAI 3.7 -11	Clarified	F-RAI 3.7 -9
D-RAI 3.7 -12	Combined with D-RAI 3.7 -3	F-RAI 3.7 -2
D-RAI 4.1 -1	OK	F-RAI 4.1 -1
D-RAI 4.2.1 -1	OK	F-RAI 4.2.1 -1
D-RAI 4.2.2 -1	OK	F-RAI 4.2.2 -1
D-RAI 4.3.1 -1	OK	F-RAI 4.3.1 -1
D-RAI 4.3.1 -2	OK	F-RAI 4.3.1 -2
D-RAI 4.3.2 -1	OK	F-RAI 4.3.2 -1
D-RAI 4.3.3 -1	OK	F-RAI 4.3.3 -1
4.3.4	(None)	(None)
D-RAI 4.3.5 -1	OK	F-RAI 4.3.5 -1
4.3.6	(None)	(None)
D-RAI 4.3.7 -1	OK	F-RAI 4.3.7 -1
4.4	(None)	(None)
D-RAI 4.5 -1	Combined with D-RAI B3.3 -1	F-RAI 4.5 -1
D-RAI 4.5 -2	OK	F-RAI 4.5 -2
D-RAI 4.6 -1	OK	F-RAI 4.6 -1
D-RAI 4.6 -2	OK	F-RAI 4.6 -2
D-RAI 4.6 -3	OK	F-RAI 4.6 -3
4.7.1	(None)	(None)

4.7.2	(None)	(None)
D-RAI 4.7.3 -1	OK	F-RAI 4.7.3 -1
D-RAI 4.7.3 -2	OK	F-RAI 4.7.3 -2
D-RAI 4.7.3 -3	OK	F-RAI 4.7.3 -3
D-RAI 4.7.3 -4	OK	F-RAI 4.7.3 -4
D-RAI 4.7.4 -1	OK	F-RAI 4.7.4 -1
D-RAI 4.7.5 -1	OK	F-RAI 4.7.5 -1
D-RAI 4.7.5 -2	OK	F-RAI 4.7.5 -2
4.7.6	New	F-RAI 4.7.6 -1
D-RAI 4.7.7 -1	OK	F-RAI 4.7.7 -1
D-RAI B2.1.1 -1	Partially resolved (2/3/03) & partially combined w/B2.1.7 -1	F-RAI B2.1.1 -1
B2.1.2	(None)	(None)
D-RAI B2.1.3 -1	OK	F-RAI B2.1.3 -1
D-RAI B2.1.3 -2	Clarified	F-RAI B2.1.3 -2
D-RAI B2.1.3 -3	OK	F-RAI B2.1.3 -3
D-RAI B2.1.3 -4	OK	F-RAI B2.1.3 -4
D-RAI B2.1.3 -5	OK	F-RAI B2.1.3 -5
D-RAI B2.1.4 -1	OK	F-RAI B2.1.4 -1
D-RAI B2.1.4 -2	OK	F-RAI B2.1.4 -2
B2.1.5	(None)	(None)
D-RAI B2.1.6 -1	OK	F-RAI B2.1.6 -1
D-RAI B2.1.6 -2	OK	F-RAI B2.1.6 -2
D-RAI B2.1.7 -1	Clarified and partially combined w/B2.1.1 -1	F-RAI B2.1.7 -1
D-RAI B2.1.8 -1	Clarified	F-RAI B2.1.8 -1
D-RAI B2.1.9 -1	OK	F-RAI B2.1.9 -1
D-RAI B2.1.10 -1	OK	F-RAI B2.1.10 -1
D-RAI B2.1.10 -2	Combined w/B2.1.10 -1	F-RAI B2.1.10 -1

B2.1.11	(None)	(None)
B2.1.12	(None)	(None)
B2.1.13	(None)	(None)
D-RAI B2.1.14	(None)	(None)
D-RAI B2.1.15 -1	OK	F-RAI B2.1.15 -1
D-RAI B2.1.15 -2	OK	F-RAI B2.1.15 -2
D-RAI B2.1.16 -1	OK	F-RAI B2.1.16 -1
D-RAI B2.1.16 -2	Combined w/B2.1.16 -1	F-RAI B2.1.16 -1
D-RAI B2.1.16 -3	OK	F-RAI B2.1.16 -2
B2.1.17	(None)	(None)
D-RAI B2.1.18 -1	OK	F-RAI B2.1.18 -1
D-RAI B2.1.18 -2	OK	F-RAI B2.1.18 -2
B2.1.19	(None)	(None)
B2.1.20	(None)	(None)
D-RAI B2.1.21 -1	OK	F-RAI B2.1.21 -1
D-RAI B2.1.21 -2	OK	F-RAI B2.1.21 -2
D-RAI B2.1.21 -3	OK	F-RAI B2.1.21 -3
D-RAI B2.1.21 -4	Clarified	F-RAI B2.1.21 -4
D-RAI B2.1.22 -1	OK	F-RAI B2.1.22 -1
D-RAI B2.1.22 -2	OK	F-RAI B2.1.22 -2
D-RAI B2.1.22 -3	OK	F-RAI B2.1.22 -3
D-RAI B2.1.23 -1	Clarified	F-RAI B2.1.23 -1
D-RAI B2.1.23 -2	OK	F-RAI B2.1.23 -2
D-RAI B2.1.23 -3	OK	F-RAI B2.1.23 -3
D-RAI B2.1.23 -4	OK	F-RAI B2.1.23 -4
D-RAI B2.1.23 -5	OK	F-RAI B2.1.23 -5
D-RAI B2.1.23 -6	Clarified	F-RAI B2.1.23 -6
D-RAI B2.1.23 -7	OK	F-RAI B2.1.23 -7

D-RAI B2.1.23 -8	OK	F-RAI B2.1.23 -8
D-RAI B2.1.23 -9	Combined w/D-RAI B2.1.30 -3	F-RAI B2.1.23 -9
D-RAI B2.1.24 -1	Partially resolved (2/3/03)	F-RAI B2.1.24 -1
D-RAI B2.1.25 -1	OK	F-RAI B2.1.25 -1
	New	F-RAI B.2.1.25 -2
D-RAI B2.1.26 -1	Clarified & partially combined w/D-RAI 3.2.2 -2	F-RAI B2.1.26 -1 F-RAI 3.2.2 -2
D-RAI B2.1.27 -1	OK	F-RAI B2.1.27 -1
	New	F-RAI B2.1.27 -2
D-RAI B2.1.28 -1	OK	F-RAI B2.1.28 -1
D-RAI B2.1.29 -1	OK	F-RAI B2.1.29 -1
D-RAI B2.1.30 -1	Resolved (2/3/03)	N/A
D-RAI B2.1.30 -2	Resolved (2/3/03)	N/A
D-RAI B2.1.30 -3	Combined w/D-RAI B2.1.23 -9	F-RAI B2.1.23 -9
D-RAI B2.1.31 -1	OK	F-RAI B2.1.31 -1
	New	F-RAI B2.1.31 -2
B2.1.32	(None)	(None)
D-RAI B2.1.33 -1	OK	F-RAI B2.1.33 -1
D-RAI B2.1.34 -1	Clarified	F-RAI B2.1.34 -1
B2.1.35	(None)	(None)
D-RAI B2.1.36 -1	OK	F-RAI B2.1.36 -1
D-RAI B2.1.37 -1	OK	F-RAI B2.1.37 -1
B3.1	(None)	(None)
B3.2	(None)	(None)
D- RAI B3.3 -1	Combined with D-RAI 4.5 -1	F- RAI 4.5 -1