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CNRO-2007-000XX

June XX, 2007

U. S. Nuclear Regulatory Commission
Attn.: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Request for Alternative GG-ISI-002
Response to Request for Additional Information

Grand Gulf Nuclear Station
Docket No. 50-416
License No. NPF-29

REFERENCES:
1. Entergy Operations, Inc. letter CNRO-2006-00043 to the NRC, dated September 22, 2006
2. Entergy Operations, Inc. letter CNRO-2007-00022 to the NRC, dated May 23, 2007

Dear Sir or Madam:

In Reference #1, Entergy Operations, Inc. (Entergy) submitted Request for Alternative GG-ISI-002, which requests approval to implement a risk-informed inservice inspection (ISI) program at Grand Gulf Nuclear Station (GGNS). The program is to be based on ASME Code Case N-716, *Alternative Piping Classification and Examination Requirements, Section XI Division 1*.

During their review of GG-ISI-002, the NRC staff provided, via e-mail, two sets of Requests for Additional Information (RAI). Entergy provided draft responses to the staff, which were reviewed and discussed at a meeting held on May 7, 2007. Based on those discussions, Entergy provided revised responses to the RAIs via Reference #2.

In a telephone call held on June 13, 2007, the staff posed additional questions regarding Entergy's responses to the first set of RAIs. To address the staff's questions, Entergy is providing revised response to this set, which is contained in the enclosure of this letter. Changes are denoted by revision bars in the margins, where applicable.

Should you have any questions regarding this submittal, please contact Guy Davant at (601) 368-5756.

This letter contains no new commitments.

Sincerely,

JFM/GHD/ghd

Enclosure: Revised Responses to Request for Additional Information Set #1

cc: Mr. J. S. Forbes (ECH)
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ENCLOSURE

CNRO-2007-000XX

REVISED RESPONSES TO REQUEST FOR ADDITIONAL INFORMATION SET #1

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REVISED RESPONSES TO REQUEST FOR ADDITIONAL INFORMATION SET #1 REGARDING REQUEST FOR ALTERNATIVE GG-ISI-002

1) Entergy, "requests authorization to implement a risk-informed inservice inspection (ISI) program based on American Society of Mechanical Engineers Boiler and Pressure Vessel Code Case N-716 (N-716)." There appears to be, however, some differences between the methodology in N-716 and the method applied by Entergy as described in the submittal.

a) Table 3 in N-716 discusses high, medium, and low failure potential and pairs these potentials with degradation categories large brake, small leak, and none respectively. It does not appear that this table was used in the submittal. Was this table used in the submittal? If not, what was used in lieu of Table 3?

Response

The information contained in Table 3 of N-716 was used in the GGNS application and submittal. The information is identified in Table 3.4-1 and Table 5 of the submittal. The information is contained in the column identified as "Failure Potential." This column is further divided into two sub-columns (i.e., "DMs" and "Rank"). The failure potential rank for high safety significant (HSS) locations is then assigned as "High", "Medium", or "Low" depending upon potential susceptibly to the various types of degradation. [Note: Low safety significant (LSS) locations were conservatively assumed to be a rank of Medium (i.e., "Assume Medium"). See response to Question 3b, below.

b) Section 5(c) in N–716 does not appear to provide a "with probability of detection (POD)" and "without POD" option in the calculation but the submittal includes one set of estimates for "with POD" and another "w/o POD" in Table 3.4-1. Please clarify how the "with POD" and "w/o POD" columns in Table 3.4-1 are consistent with Section 5(c) in N-716.

Response

It is true that N-716 does not discuss the two options presented above. The GGNS submittal contained both options in order to be consistent with previous RI-ISI submittals which contained both options. These two sets of analyses are typically conducted to provide a sensitivity of the delta risk evaluation with respect to assumptions on POD.

c) The estimates in the "w/o POD" column in Table 3.4-1 seem to include a standard POD of 0.5. Is this correct? If not, please provide some examples using the conditional core damage probability (CCDP) values from page 11 of 28 to produce the entries in Table 3.4-1.

Response

That is correct; the "w/o POD" column applies a POD of 0.5 for both the Section XI program and the N-716 program. Thus, there is no extra credit assumed for an N-716 inspection as compared to Section XI inspection as to inspection effectiveness (e.g., due to larger inspection volumes in the N-716 program).

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d) Section 7 in N-716, “Program Updates,” includes several steps that make up a program update. Page 14 of 28 in your submittal states that, “[u]pon approval of the RIS_B Program, procedures that comply with the guidelines described in Electric Power Research Institute (EPRI) TR-112657 (EPRI Topical) will be prepared to implement and monitor the program.” Please identify the Sections in the EPRI Topical that describe the update program that Exelon intends to implement. Please describe and compare the update program that Exelon intends to implement against the characteristics of such a program as described in Section 7 of N-716.

Response

The wording in GG-ISI-002 is based on previous industry RI-ISI submittals. While the intent of both updating processes (EPRI TR-112657 and N-716) is the same, Entergy will meet the wording of N-716.

2) The relationship between N-716's guideline that, “any piping segment whose contribution to core damage frequency (CDF) is greater than 1E-6/year is a high safety significant (HSS) segment,” and the EPRI Topical guidelines for safety significant categorization is unclear. For example, a low consequence segment in the EPRI Topical methodology has a CCDP less than 1E-6, an identical numerical value but a different metric than the 1E-6/year guideline in N-716. Page 3-8 in the EPRI Topical provides an explanation that the CCDP and conditional large early release probability (CLERP) ranges were selected, “to guarantee that all pipe locations ranked in the low consequence category do not have a potential CDF impact higher than 1E-8 per year or a potential large early release frequency (LERF) impact higher than 1E-9 per year.” Inspection of Table 3.1 in your submittal also indicates that there are no entries in the “CDF > 1E-6" column indicating that no segments in the Grand Gulf flooding probabilistic risk assessment (PRA) exceeded this guideline.

a) The N-716 code case Section 2(5) does not include a LERF guideline analogous to the CDF guideline, and Table 3-1 in your submittal includes a column for CDF but not for LERF. Please explain why a LERF guideline is not included as a guideline in parallel with CDF.

Response

Entergy agrees that most PRA applications with a CDF guideline include a LERF guideline, as well. Therefore, Entergy proposes to add a LERF guideline of 1E-07/year to the requirements of Section 2(5) of Code Case N-716. Additionally, GGNS has reviewed LSS piping [e.g., non HSS Class 2, Class 3, and non-nuclear safety (NNS) piping] against the new LERF requirement. As a result of this review, Entergy has confirmed that, in addition to having a CDF contribution of less than 1E-06/year, this piping also has a LERF contribution of less than 1E-07/year.

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b) Please provide a discussion justifying the guideline value for CDF selected in Section 2(5) in N-716 (i.e., 1E-6/year).

Response

As discussed in the response to RAI 2a), Entergy has added a criterion for LERF of 1E-07/year.

From a practical perspective, the criterion used in Section 2(a)(5) of N-716 has two potential impacts. Each is discussed below.

1. *Class 2 Piping*

   Any piping that has inspections added or removed per this code case, regardless of the value of this criterion, is required to be assessed as to its impact on risk. This risk impact analysis is conducted on an individual system basis, which includes the cumulative effect of LSS Class 2 piping currently being inspected. The change-in-risk acceptance criteria on a system basis are defined as 1E-07/year (CDF) and 1E-08/year (LERF). These criteria are derived from Regulatory Guide (RG) 1.174 and were approved by the NRC in EPRI TR-112657. If the change-in-risk acceptance criteria are not met, additional inspections are to be defined until these criteria are met [N-716 Section 5(d)]. Therefore, regardless of the number of segments (or inspections) that fall below these criteria, unacceptable risk changes will not occur and the safety objectives of risk-informed regulation will be met.

   The change-in-risk analysis could be conducted without the benefit of these criteria [i.e., Section 2(a)(5) of N-716 and LERF per RAI 2a)] and shown to have acceptable changes in plant risk. In fact, this was demonstrated in the N-716 whitepaper where eight plants (4 BWRs, 4 PWRs) were compared to the N-716 criteria. N-716 was shown to provide for more inspections than traditional RI-ISI approaches even when the criterion of Section 2(a)(5) was not used. And, as expected, the change-in-risk acceptance criteria of 1E-07//year (CDF) and 1E-08//year (LERF) were met for these eight plants. However, implementation of this ancillary criterion [Section 2(a)(5) of N-716 and LERF per RAI 2a)] provides increased confidence that the change-in-risk acceptance criteria will be met without the need for additional inspections as would be required by Section 5(d) of N-716. Thus, any risk outliers, if they exist in Class 2 piping [(e.g., piping that exceeds the Section 2(a)(5) criterion and LERF per RAI 2a)], would require that, on a plant-specific basis, piping be added to the scope of HSS piping and subjected to inspection.

2. *Class 3 / NNS Piping*

   Currently, there are no Section XI NDE requirements for this piping. As such, use of this ancillary criterion [Section 2(a)(5) of N-716 and LERF per RAI 2a)], regardless of its value, can only result in a reduction in plant risk further supporting the safety objectives of risk-informed regulation. These additional inspections would be imposed on piping identified by the criterion of Section 2(a)(5) of N-716 and LERF per RAI 2 a) and cannot be used to reduce inspections in other HSS piping [see N-716 Section 4(b)].

From a more global perspective, the ancillary criteria of Section 2(a)(5) of N-716 and of LERF per RAI 2a) provide additional criteria that can only potentially increase the scope of HSS locations (i.e., will only increase the number of inspections). Although, the criteria of Sections 2(a)(1) through 2(a)(4) of N-716 were created based on the large number of risk-informed applications performed to date, Section 2(a)(5) of N-716 and LERF per RAI 2a) were added as a defense-in-depth measure to N-716 to provide a method of ensuring that any plant-specific locations that are important to safety are identified.

Adopting RI-ISI programs permits a reduction in inspection by focusing inspections on the more important locations while, at the same time, maintaining or improving public health and safety. Use of this ancillary guideline and a technically adequate, plant-specific flooding evaluation to identify relatively important locations (e.g., Class 2, 3, or NNS piping) provides additional confidence that inspections will be focused on the more important locations.

According to the guidelines in RG 1.174, plant changes (permitting the reallocation of resources) that increase risk less than 1E-06/year (CDF) / 1E-07/year (LERF) would normally be considered very small and acceptable as long as the other principles are satisfied. This is considered to be a reasonable metric for identifying significant pipe segments since the potential reduction in CDF (LERF) from inclusion of such segments in the ISI program would also be very small. Additionally, use of the guideline value of 1E-06/year for CDF (1E-07/year for LERF) taken together with the system level change-in-risk limits of 1E-07/year for CDF (1E-08/year for LERF) provides additional assurance that plant-specific application of N-716 will meet the acceptance criteria of Region III in Figures 3 and 4 of RG 1.174. Thus, assuring any increase would be small and consistent with the intent of the Commission's Safety Goal Policy Statement.

Finally, traditional RI-ISI approaches can be applied on a partial scope basis. That is, many plants have applied RI-ISI to Class 1 piping only. Thus, these plants have not witnessed the additional safety benefit of identifying and inspecting Class 2, 3, or NNS piping per criterion Section 2(a)(5) of N-716 and LERF per RAI 2a).

c) Please provide a list of the piping segments that were compared to the > 1E-6/year criterion along with the CDF and LERF estimates, the pipe failure frequency, and the CCDP and conditional large early release probability for each segment.

Response

The scope of piping reviewed against this criterion consisted of Class 2 piping not classified as HSS (e.g., BER, Class 3, and non-nuclear safety piping). The GGNS internal flooding study was used to conduct this comparison. The GGNS internal flooding study was performed in a step-by-step manner with an initial qualitative screening to identify the significant flood events and a quantitative analysis to determine the contribution to core damage for the most significant flood scenarios.

As opposed to a segment-by-segment evaluation, the GGNS internal flooding study was performed by defining flood zones, identification of their contents (e.g., important equipment), identification of potential flood sources, identification of flood propagation *pathways, a qualitative screening analysis and a quantitative analysis of potentially important flood scenarios.*

With respect to flood frequency, only the largest flood initiator per system in each flood zone was considered if the frequency and consequence of the larger flood initiator were approximately of the same magnitude as those of the smaller one. If the frequency of the smaller flood initiator was higher and its consequences similar to that of the larger initiator, the smaller flood initiator was considered the primary flood source for that particular system. For screening purposes, this is conservative from an internal flooding study perspective. It is also conservative from an N-716 perspective because some of these flooding sources (e.g., tanks) may not be within the N-716 scope (e.g., piping).

An example of the process is described as follows:

> *A flooding scenario in flood zone "A" revealed that a Flow Control Valve (FCV) in support of system "Z" would become submerged. Using the component failure matrix developed for the internal flooding study, this FCV is identified to fail when submerged. The fault tree for system "Z" is reviewed and the FCV failure is discovered to lead to the failure of the in-line pump, which results in system "Z" being unable to deliver flow to its loads. Therefore, the entire system "Z" fails due to submergence of the FCV. Subsequent to the analysis of the failure of system "Z", the dependency matrices were used to determine which other systems would fail [e.g., Instrument Air system failure would lead to failure of several mitigating systems, including Control Rod Drive (CRD), Containment Venting, Feedwater, Condensate, Component Cooling Water (CCW), Turbine Building Cooling Water (TBCW), and Plant Service Water (PSW)].*
>
> *A listing of failed mitigating systems for each flooding scenario, as well as available mitigative systems, was compiled for use in the qualitative analysis.*

Flood initiation frequency was on the order of 1E-3 to 1E-4 / year per zone. The failure of a single equipment train is on the order of 1E-2, except for some equipment [(e.g., Reactor Core Isolation Cooling (RCIC)] which can be higher (e.g., 1E-1). Therefore, the approximate likelihood of a flood plus two unrelated, random system failures is 1E-7 to 1E-8 / year. Due to the approximate nature of these estimated values, it is possible that a flood plus two random failures could occur with some significant probability. Thus, any flood scenario for which two or less random failures could produce core damage was analyzed in more detail. Similarly, any flood scenario for which three or more random system failures could produce core damage was screened out. Typically, this screening was done on a zone-by-zone basis. Thus, individual segments within the zone would have a likelihood of core damage less than that for the entire zone.

Based on the above, two flooding scenarios required detailed quantification. These scenarios involved the PSW system (CDF = 1.99E-7) and the standby service water system (CDF = 2.26E-8), which, after detailed quantitative assessment, fall below the criterion of section 2(5) of N-716.

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d) Please provide any observations made during any independent reviews of the Grand Gulf flooding PRA or observations from the internal events review that are also applicable to the flooding analysis. Please describe how these observations have been resolved such that there is confidence that segments that have a CDF greater than the guideline value have been identified.

Response

As indicated in the initial submittal, the industry peer review of the GGNS PRA was conducted in August 1997. The facts and observations (F&O) from this review were characterized with regard to level of significance and given scores of A, B, C or D. An F&O with a level of significance of "A" is one that is extremely important and necessary to address to assure the technical adequacy of the PRA or the quality of the PRA. These should be addressed promptly. An F&O with a level of significance of "B" is one that is important and necessary to address, but may be deferred until the next PRA update. "C" F&Os are of marginal importance, but are considered desirable to maintain maximum flexibility in PRA Applications and consistency in the industry. "D" F&Os are editorial or minor technical items left to the discretion of the utility. As such, the important F&Os to PRA technical adequacy and quality are those categorized as "A" or "B." Within the "A" & "B" F&Os, only two "B" F&Os are on the internal flooding analysis.

The first "B" F&O stated that the dependency table in the internal flooding analysis did not list the Instrument Air system as a support system. No changes were necessary to address this comment since Instrument Air was clearly listed as a support system in various locations in the documentation, including the mitigating systems-versus-support systems dependency table and the support systems-versus-support systems table.

The remaining "B" F&O documented issues associated with a single flooding sequence. The first issue questioned whether there was a thermal hydraulic calculation which supports the use of a single CRD pump for success following a manual emergency depressurization. This issue was addressed by developing a calculation for CRD success criteria. As a result of the calculation, CRD is now credited only after another system (such as RCIC or HPCS) has provided core injection for approximately 5 hours and two CRD pumps operate. This modeling is incorporated into the modeling used to develop CCDPs for the N-716 analysis. The second issue pointed out that the text description of a sequence indicated that it resulted in core damage while the event tree indicated that the core was OK. The text description was in error and, since the event tree was the input into the development of the overall model fault tree, there was no related impact on the PRA results. The remaining issue stated that containment venting is not asked in the sequence; therefore, containment heat removal capability is unknown. That was basically a true statement as it was not necessary to vent the containment in order to determine the outcome of this sequence. Containment failure does not directly lead to failure of operating injection pumps since the most likely failure location is high in the containment and any steam released into the Auxiliary Building is not expected to impact these pumps which are low in the Auxiliary Building.

3) Section 5(c) in N-716 does not clearly specify what population of welds should be included in the change of risk estimates and what welds may be excluded. The description of the parameters in the equations in Section 5(c) indicates that any weld that was inspected

under Section XI or that will be inspected under the RI-ISI program will be included in the change in risk estimate.

a) Is the population of welds that should be included in the N-716 change in risk estimate all welds that were inspected under Section XI and that will be inspected under the RI-ISI program? If not, where in code Case N-716 is the guidance that reduces the population of welds that should be included in the change-in-risk estimate.

Response

The population of welds to be included in the change-in-risk assessment includes all welds receiving NDE except for those that receive only a surface examination and are not susceptible to outside diameter attack [e.g., external chloride stress corrosion cracking (ECSCC)]. This population includes so-called "risk category 6 and 7" locations, which are not required to be included in the RI-ISI delta risk assessment. (Note: Table 5 of GG-ISI-002 lists the surface examination requirements prior to GGNS implementation of ASME Code Case N-663.)

It is the intent of the Code Case authors to update N-716 to reflect this requirement (i.e. exclusion of surface-only examinations without outside diameter attack) as well as any other relevant feedback from the pilot plant process.

b) If all welds that were or will be inspected are included in the change-in-risk estimates in Table 4.4-1 in your submittal, how are the CCDP, CLERP, and the failure frequency estimated for LSS welds?

Response

For CCDP/CLERP, values of 1E-4 / 1E-5 were conservatively used. The rationale for using these values is that the change-in-risk evaluation process of N-716 is similar to that of the EPRI RI-ISI methodology. As such, the goal is to determine CCDPs/CLERPs threshold values. For example, the threshold values between High and Medium consequence categories is 1E-4 (CCDP) / 1E-5 (CLERP) and between Medium and Low consequence categories are 1E-6 (CCDP) / 1E-7 (CLERP) from the EPRI RI-ISI Risk Matrix. Using these threshold values streamlines the change-in-risk evaluation as well as stabilizes the update process. For example, if a CCDP changes from 1E-5 to 3E-5 due to an update, it will remain below the 1E-4 threshold value; the change-in-risk evaluation would not require updating.

The above values were derived from the GGNS internal flooding study. The CCDP for in-scope LSS Class 2 piping previously being inspected is less than 1E-4 with no containment bypass breaks. Therefore, the 0.1 conditional LERF is also reasonable. The values are consistent with and conservatively above any CCDP value obtained for GGNS in-scope Class 2 piping, and the CLERP value is appropriately scaled.

With respect to assigning failure potential for LSS piping, the criteria are defined by Table 3 of the Code Case. That is, those locations identified as susceptible to FAC (or another mechanism and also susceptible to water hammer) are assigned a high failure potential. Those locations susceptible to thermal fatigue, erosion-cavitation, corrosion or stress corrosion cracking are assigned to a medium failure potential and those *locations that are identified as not susceptible to degradation are assigned a low failure potential.*

In order to streamline the application, a review was conducted to verify that the LSS piping was not susceptible to FAC or water hammer. This review was conducted similar to that done for a traditional RI-ISI application. Thus, the High failure potential category is not applicable to LSS piping. In lieu of conducting a formal degradation mechanism evaluation for all LSS piping (e.g. to determine if thermal fatigue is applicable), these locations were conservatively assigned to the Medium failure potential ("Assume Medium" in Table 3.4-1) for use in the change-in-risk assessment. Experience with previous industry RI-ISI applications shows this to be conservative.

4) Page 11 of 28 describes how the CCDP and CLERP of different categories of pipe breaks are estimated in support of the change-in-risk estimates. For example, bounding values for pipe breaks that result in isolable loss-of-coolant accidents (LOCAs) are derived as the product of the CCDP from unisolable LOCAs and the probability of a motor operated valve failing to close on demand. This type of an evaluation can be very analyst specific and essentially bypasses the PRA peer review process upon which the NRC relies to minimize the staff review of the plant specific PRA for each risk-informed submittal.

a) The submittal states that it used bounding CCDP and CLERP values for pipe breaks that result in a LOCA. What are the current CCDP and CLERP values for the different LOCA sizes in the current Grand Gulf PRA? Was one LOCA size selected for all LOCAs and, if so, why is one size sufficient?

Response

The GGNS PRA models a variety of LOCA sizes. LOCA CCDPs were re-calculated to support the previously completed RI-BER application. These values are provided below. As can be seen, the intermediate LOCA is the bounding event. Also, a CCDP/CLERP value of 0.1 was conservatively assigned to develop a corresponding/bounding CLERP. These values (CCDP = 5.4E-4 and CLERP = 5.4E-5) were used in the N-716 change-in-risk assessment for locations that would result in a LOCA.

Initiator	***Description***	***CCDP***
%A	*Large LOCA*	*5.19E-04*
%S1	*Intermediate LOCA*	*5.40E-04*
%S2	*Small LOCA*	*5.31E-06*

b) Please identify events modeled in the Grand Gulf PRA that are similar to the isolable LOCA and potential LOCA events quantified on page 11 of your submittal or further clarify why the Grand Gulf PRA can not be used to develop the required estimates. If applicable events in the PRA can be identified, please provide a description of these

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events and the bounding CCDP and CLERP values for these types of breaks derived from the PRA.

Response

The GGNS PRA does not explicitly model potential and isolable LOCA events, because such events are subsumed by the LOCA initiators in the PRA. That is, the frequency of a LOCA in this limited piping downstream of the first RCPB isolation valve times the probability that the valve fails is a small contributor to the total LOCA frequency. The N-716 methodology must evaluate these segments individually; thus, it is necessary to estimate their contribution. This is estimated by taking the LOCA CCDP and multiplying this by the valve failure probability.

c) Please describe how the CCDP and CLERP values for "non reactor coolant pressure boundary pipe breaks that occur in standby system piping" were developed from the Grand Gulf flooding PRA. What is the relationship between this analysis, and the analysis used to implement the N-716 guideline that any segment with a CDF > 1E-6/year should be categorized high safety significant?

Response

Please see the responses to Questions 2(c) and 3(b), above.

d) In the "Break Location" column in Table 3.4-1 in your submittal, there are some entries labeled "Class 2". What characteristics results in a "Class 2" designation and how are the CCDPs and CLERPs of these welds developed?

Response

The "Class 2" designation in Table 3.4-1 is used to identify those Code Class 2 locations that are not HSS because they do not meet any of the five HSS criteria of Section 2(a) of N-716 (e.g., not part of the BER scope). With respect to CCDPs/CLERPs, please see the response to Question 3(b), above.

e) How does GGNS evaluate interfacing system LOCAs as part of GG-ISI-002?

Response

The CCDP estimates for LOCA outside containment is based on the following:

- *For piping in the BER scope - a plant-specific BER evaluation is used to estimate CCDP.*
- *For Class 1 piping not in BER scope - the CCDP estimate is based on passive failure of 1st pressure boundary valve (~ 1E-3) and mitigation failure from GGNS ISLOCA analysis (~ 1E-3).*
- *For Class 2 piping not in BER scope - the 1E-4 CCDP used for LSS Class 2 piping bounds the probability of multiple valves failures that are required to initiate a possible LOCA outside containment.*

The risk impact assessment (CDF and LERF) for applicable piping meets risk acceptance criteria for the N716 application with significant margin.

5) The fourth bullet on page 11 of 28 in your submittal states that CCDP and CLERP values were determined based on the risk informed break exclusion region (RI-BER) evaluation performed for Grand Gulf. How many welds were being inspected in the RI-BER program and how many will be inspected in the proposed RIS_B program? Please summarize the reasons for any change in the number of welds to be inspected in the BER.

Response

Currently, there are 24 inspections included within the RI-BER program. This represents an inspection population that is 7% of the total BER population. This program was implemented via the GGNS 10 CFR 50.59 program. Per the requirements of N-716, a minimum of 10% of the BER population is to be inspected. For GGNS, this results in a total of 35 inspections. However, N-716 contains an additional requirement that pertains to the BER scope at GGNS. That is, the number of inspections is also weighted towards those locations that are potentially susceptible to degradation versus those locations that do not have a degradation mechanism identified. This requirement increases the number of inspections in the BER portion of this N-716 application to 45 inspections (please see Table 3.3 of GG-ISI-002 for a breakdown of these locations).

6) Note 2 in Table 5 of your submittal explains that the column “other” in the table was not filled in. Please update Table 5 by filling in the “other” column. Notes 3 and 4 will provide the needed differentiation between “other” inspections credited versus not credited in the RIS_B program.

Response

Please see attached the updated table.

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Table 5

Inspection Location Selection Comparison Between ASME Section XI Code and Code Case N-716

System[(1)]	Safety Significance		Break Location	Failure Potential		Code Category	Weld Count	Section XI		Code Case N-716	
	High	Low		DMs	Rank			Vol/Sur	Sur Only	RIS_B	Other[(2)]
RPV	✓		LOCA	TASCS, TT, (IGSCC)	Medium (Medium)	B-F	6	6	0	4[(3)]	4
RPV	✓		LOCA	TT, (IGSCC)	Medium (Medium)	B-F	1	1	0	0	–
						B-J	1	1	0	0	–
RPV	✓		LOCA	None (IGSCC)	Low (Medium)	B-F	20	20	0	0	–
						B-J	6	6	0	0	–
RPV	✓		LOCA	None	Low	B-F	1	1	0	0	–
						B-J	5	5	0	0	–
FW	✓		LOCA	TASCS, TT	Medium	B-J	60	18	0	9	–
FW	✓		ILOCA	TASCS, TT	Medium	B-J	10	8	2	7	–
FW	✓		BER	TASCS, TT	Medium	C-F-2	10	1	0	3	–
FW	✓		ILOCA	TASCS	Medium	B-J	4	0	4	4	–
FW	✓		LOCA	TT	Medium	B-J	3	2	0	3	–
FW	✓		ILOCA	None	Low	B-J	4	0	1	0	–
FW	✓		BER	None	Low	C-F-2	17	1	0	0	–
MS	✓		LOCA	None	Low	B-J	107	9	4	4	–
MS	✓		ILOCA	None	Low	B-J	64	8	34	0	–
MS	✓		PLOCA	None	Low	B-J	2	0	2	0	–
MS	✓		BER	None	Low	C-F-2	20	2	0	0	–
SD	✓		LOCA	None	Low	B-J	37	0	4	4	–

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Table 5

Inspection Location Selection Comparison Between ASME Section XI Code and Code Case N-716

System[1]	Safety Significance		Break Location	Failure Potential		Code Category	Weld Count	Section XI		Code Case N-716	
	High	Low		DMs	Rank			Vol/Sur	Sur Only	RIS_B	Other[2]
SD	✓		ILOCA	None	Low	B-J	4	0	0	0	–
SP	✓		LOCA	None	Low	B-J	5	0	0	1	–
RCR	✓		LOCA	None (IGSCC)	Low (Medium)	B-J	25	6	0	8[4]	8
RCR	✓		LOCA	None	Low	B-J	161	38	4	12	–
RCR	✓		PLOCA	None	Low	B-J	8	0	4	0	–
CRD		✓	Class 2	N/A	Assume Medium	C-F-2	63	5	0	0	–
SLC	✓		LOCA	None	Low	B-J	5	0	0	4	–
SLC	✓		PLOCA	None	Low	B-J	37	0	4	1	–
RHR	✓		BER	TT, CC	Medium	C-F-2	4	0	0	1	–
RHR	✓		BER	TT	Medium	C-F-2	13	4	0	4	–
RHR	✓		LOCA	None	Low	B-J	24	8	0	7	–
RHR	✓		PLOCA	None	Low	B-J	55	10	0	1	–
RHR	✓		BER	None	Low	C-F-2	18	3	0	0	–
RHR		✓	Class 2	N/A	Assume Medium	C-F-2	500	32	2	0	–
LPCS	✓		LOCA	None	Low	B-J	7	4	0	3	–
LPCS	✓		PLOCA	None	Low	B-J	25	4	0	1	–
LPCS		✓	Class 2	N/A	Assume Medium	C-F-2	64	5	0	0	–
HPCS	✓		LOCA	TT	Medium	B-J	4	3	0	2	–
HPCS	✓		LOCA	None	Low	B-J	8	3	1	2	–
HPCS	✓		PLOCA	None	Low	B-J	30	2	0	1	–

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Table 5

Inspection Location Selection Comparison Between ASME Section XI Code and Code Case N-716

System[1]	Safety Significance		Break Location	Failure Potential		Code Category	Weld Count	Section XI		Code Case N-716	
	High	Low		DMs	Rank			Vol/Sur	Sur Only	RIS_B	Other[2]
HPCS		✓	Class 2	N/A	Assume Medium	C-F-2	82	6	0	0	–
MSLC	✓		ILOCA	None	Low	B-J	31	0	1	4	–
FWLC	✓		PLOCA	None	Low	B-J	11	0	0	2	–
RCIC	✓		LOCA	None	Low	B-J	7	0	0	2	–
RCIC	✓		PLOCA	None	Low	B-J	5	0	0	1	–
RCIC	✓		BER	None	Low	C-F-2	12	5	0	0	–
RCIC		✓	Class 2	N/A	Assume Medium	C-F-2	107	4	0	0	–
CGC		✓	Class 2	N/A	Assume Medium	C-F-1	3	3	0	0	–
						C-F-2	5	0	0	0	–
RWCU	✓		LOCA	None	Low	B-J	65	11	1	10	–
RWCU	✓		ILOCA	None	Low	B-J	25	8	0	2	–
RWCU	✓		BER	None	Low	B-J	4	0	0	0	–
						C-F-2	22	2	0	0	–
						Class 3	11	0	0	2	–
						Other	1	0	0	0	–
RWCU	✓		Class 2	None	Low	B-J [5]	3	0	0	0	–
RWCU		✓	Class 2	N/A	Assume Medium	C-F-2	2	0	0	0	–

Notes for Table 5

1. Systems are described in Table 3.1.
2. The column labeled "Other" is generally used to identify plant augmented inspection program locations credited per Section 4 of N-716. N-716 allows the existing plant augmented inspection program for IGSCC (Categories B through G) to be credited toward the 10% requirement. GGNS selected a 10% sampling without relying on IGSCC Program locations beyond those selected for RIS_B purposes either due to the presence of other damage mechanisms, or where no other damage mechanism is present.
3. These four piping welds have been selected for examination per the plant augmented inspection program for IGSCC (Category C) and for RIS_B purposes due to the presence of other damage mechanisms.
4. These eight piping welds have been selected for examination per the plant augmented inspection program for IGSCC (Category B) and are being credited for RIS_B purposes.
5. Although this piping classifies as Class 2 piping, GGNS conservatively treats it (i.e., NDE) as examination category B-J for inspection purposes.