NRC FORM 8C
(7-94)
NRCMD 3.57

COVER SHEET FOR CORRESPONDENCE

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NRC Request for Additional Information Set 1 IOLB

NRC RAI Set 1 Number 1 IOLB

The section discussing operator response states that the increase in power level results in changes to event dynamics. CPPU reduces certain operator response times, which could decrease operator reliability. Based on PRA experience for uprated BWRs, some effect is expected on PRA results (such as CDF and LERF). The CPPU effect will be determined when the plant specific PRA is revised.

The staff believes that the results of the plant-specific PRA, by themselves, would not provide sufficient information to support a safety evaluation concerning the effect of CPPU on operator response. The staff will expect the plant-specific submittal to explain and justify any changes in plant risk that result from changes in risk-important operator actions. The submittal should describe any new risk-important operator actions required as a result of the proposed power uprate and changes (e.g., reduced time available or additional time required) to any current risk-important operator actions that will occur as a result of the power uprate. The submittal should describe the specific procedural steps involved in these actions. The submittal should also address any operator work-arounds that might affect these response times and identify any operator actions that are being automated as a result of the power uprate. Please state how the guidance to be provided by GE will be consistent with the staff's expectations for the plant specific submittal?

GE Response

In response to the Staff request and to provide a more consistent guidance for the preparation of plant specific submittals, additional guidance will be added to the CPPU Power Uprate Safety Analysis Report (PUSAR) shell. This document is used as the starting point in the preparation of plant specific CPPU PUSAR documents and reflects the expected level of details for each section, including lessons learned based on past NRC RAIs.

NRC RAI Set 1 Number 2 IOLB

GE Response

Request 2.a

The section discussing operator training and human factors states that classroom training will address "various aspects of CPPU." Although examples of training topics are provided, it is not clear what selection criteria would be used to identify the material that will be addressed in training. Please describe the criteria for selecting the training topics or how the guidance to be provided by GE will be consistent with the selection of training topics in accordance with a systems approach to training.

GE Response

Operator training is the responsibility of the Licensee. The selection criteria for training topics are within the scope of the Licensee. Changes to operator training will be made consistent with the current plant training program requirements. It is expected that these changes will be made consistent with similar changes made for other plant modifications and include any changes to Technical Specifications, EOPs, and plant systems. Changes to operator training are expected to be limited in scope since the CPPU effect on normal plant operation and plant events does not significantly affect required operator actions. In addition, changes to the operator training program are considered as part of the CPPU implementation plan, which are typically identified subsequent to the power uprate licensing submittal. However, these changes must be completed and implemented prior to any power ascension above the currently licensed power level. The examples cited in the CPPU LTR are provided for information only and not as a plant specific commitment.

Request 2.b

The section discussing operator training and human factors states that simulator changes and fidelity revalidation will be performed in accordance with ANSI/ANS 3.5-1985. Please describe the schedule for these activities relative to the implementation of the associated simulator training and uprated power operation. The staff notes that the topical report guidance, as presently written, commits licensees to use ANSI/ANS 3.5-1985. More recent revisions of this standard that have been endorsed by the NRC (including the 1998 revision for which NRC endorsement is expected in the near-term) would also be acceptable and may be preferable. Please state why the topical report guidance is limited to the 1985 revision of ANSI/ANS 3.5.

GE Response

Simulator changes and fidelity revalidation are the responsibility of the Licensee and will be made consistent with the current plant program requirements. It is expected that these changes will be made consistent with similar changes made for other plant modifications that may affect

the simulator performance. Simulator changes and fidelity revalidation are expected to be limited in scope since the CPPU effect on normal plant operation and plant events does not significantly affect operator actions. In addition, simulator changes and fidelity revalidation scope are considered as part of the CPPU implementation plan, which are typically identified subsequent to the power uprate licensing submittal. However, any required simulator changes and revalidation will be completed and implemented prior to any power ascension above the currently licensed power level. In addition, the following sentence in the CLTR, "Simulator changes and fidelity revalidation will be performed in accordance with ANSI/ANS 3.5-1985" will be modified to read "Simulator changes and fidelity revalidation will be performed in accordance with the ANSI/ANS 3.5 standard applicable to the current program" to better reflect existing plant commitments.

Request 2.c

The report does not identify the human factors changes that will be necessary to support CPPU. The staff will need to know the changes that will be made to control room displays, controls, and alarms and how the operators will be tested to determine that they can use the instruments reliably. Please provide this information or the bases for a conclusion that necessary human factors changes will be identified and implemented as part of a licensee's preparation for CPPU.

GE Response

Human factors changes are the responsibility of the Licensee and will be made consistent with the current plant program requirements. It is expected that these changes will be made consistent with similar changes made for other plant modifications. Based on previous power uprate experience, changes to human factors are expected to be limited in scope since CPPU does not significantly affect control room displays, controls, and alarms. In addition, human factor changes depend on the specific plant modifications and are considered as part of the CPPU implementation plan. These changes are typically identified subsequent to the power uprate licensing submittal. However, any required changes will be completed and implemented prior to any power ascension above the currently licensed power level.

NRC RAI Set 1 Number 3 IOLB

Emergency Operating Procedures

In addition to emergency operating procedures the report should address any changes to abnormal operating procedures. Please describe the effect of CPPU on abnormal operating procedures and the basis for GE's disposition.

GE Response

Operating procedures are the responsibility of the Licensee. Changes to abnormal operating procedures will be made consistent with the plant requirements for their updating. It is expected that these changes will be made consistent with similar changes made for other plant modifications and include any necessary changes to plant systems or plant response to specific events. In addition, changes to operating procedures are considered as part of the CPPU

implementation plan, which may be identified subsequent to the power uprate licensing submittal. However, these changes must be completed and implemented prior to any power ascension above the currently licensed power level.

The CLTR Acronym list will be updated to include the term AOP (Abnormal Operating Procedures)

In response to the Staff request and to provide a more consistent guidance for the preparation of Section of plant specific submittals, additional guidance will be added to the PUSAR shell.

NRC Request for Additional Information Set 2

NRC RAI Set 2 Number 1 I&C

Sections , NSSS and BOP instrumentation and control

the staff feels that discussion on the effect of CPPU on the NSSS and BOP instrumentation and control should be submitted for each plant as effect of the CPPU may be different for different plants because of the licensee and vintage of the plant. This discussion should include all the changes to the instrumentation and control required because of changes in the setpoint, scaling, obsolescence, or the change in control philosophy.

GE Response

the CPPU Power Uprate Safety Analysis Report (PUSAR) shell that is used as the starting point in the preparation of plant specific CPPU PUSAR documents and reflects the expected level of details for each section will include the requirement that any major changes to the NSSS or BOP monitoring and control are addressed in the plant specific CPPU PUSAR.

NRC RAI Set 2 Number 2 I&C

Section , Technical Specification instrument setpoint

All changes to technical specification (TS) should be included in the plant specific submittal as TS changes are the part of the license amendment and require staff approval. This submittal should include the reason for the change and justification for accepting the changes. Also, the topical report is requesting to change the instrument setpoint and allowable values

. The staff finds the

proposed request unacceptable as this is not consistent with the plant licensing basis and may result in non-conservative instrument setpoint and allowable values. It will also be difficult to review the acceptability of the proposed changes to the instrument setpoint and allowable value by the staff and plant design basis may be lost. Therefore, the staff requires that a discussion of the instrument setpoint methodology should be included in the topical as well as plant specific submittal. Also, many plants have their own instrument setpoint methodology and some plants use GE setpoint methodology for NSSS and plant specific setpoint methodology for BOP instrumentation. A discussion of the instrument setpoint methodology should be included with the plant specific submittal as the plant specific instrument setpoint methodology may not have been reviewed and approved by the staff.

GE Response

All Technical Specification changes required to implement CPPU are discussed in the appropriate section of the plant specific submittal. The scope of anticipated Technical Specification change is described in Section 11.1.

it is important to recognize that the Technical Specification allowable values are highly dependent on the results of the safety analysis. The safety analysis generally establishes the analytical limits. There is typically substantial margin in the safety analysis process that should be considered in establishing the setpoint process used to establish the Technical Specification allowable values and other setpoints.

The original setpoint calculation is required to establish the treatment of uncertainties used to define the margin required to establish the allowable value and nominal trip setpoint from the original analytical limit.

NRC RAI Set 2 Number 1 PRA

Revision 1 of the GE CPPU Topical Report Section , Individual Plant Evaluation, is a considerable improvement over the original section. The staff is aware that GE uses a report shell that contains more information than is currently presented in the topical report. However, there are a number of areas that are not fully addressed that, if addressed, would enhance the guidance and ensure that the initial licensee EPU submittals would cover the key risk areas of the

staff review. The following comments are provided to address these areas. For clarification, add something like the following to the end of the last paragraph of Section : ", including a description and quantification of the effect of the CPPU on CDF and LERF."

NRC RAI Set 2 Number 2 PRA

The CPPU Basis in Sections states that the CPPU is not expected to have a major effect on each of these areas (i.e., initiating event frequencies and component or system reliability). The staff believes this statement is only valid if equipment are not operated beyond their design limits, conditions, and ratings and if plant monitoring programs (e.g., maintenance rule, flow accelerated corrosion, environmental qualification, etc.) are maintained such that performance degradation is detected early. Therefore, add something like the following to the end of each of these sentences: ", as long as equipment operating limits, conditions, and/or ratings are not exceeded. ~~The plant specific submittal will also identify the plant monitoring programs that are relied upon to monitor and detect degradation in equipment performance so as to maintain the reliability of this equipment. In addition, t~~ (Note: This deletion was agreed to by NRC Staff during a GE/NRC meeting on 10/24/01.) The plant specific submittal will identify and address the risk acceptability of any equipment that exceeds its operating limits, conditions, and/or ratings."

NRC RAI Set 2 Number 3 PRA

The CPPU Basis in Sections states that the effects in each area will be included in the revised plant specific PRA, but it is not clear that this information, or the revised PRA results, will be included in the plant specific submittal. For clarification, add something like the following to the end of each of these sentences: "and a description of each of these effects, as well as their quantified impacts on CDF and LERF, will be provided in the plant specific submittal."

NRC RAI Set 2 Number 4 PRA

Similar to the three subsections currently provided in Section , an additional subsection needs to be included to address success criteria. In addition, it is noted that the current subsections are geared towards an internal events PRA, but this is not clearly stated.

NRC RAI Set 2 Number 5 PRA

Similar to the internal events PRA discussion currently presented, the plant specific submittal needs to also address external events, shutdown operations, and PRA quality. Thus, three additional subsections need to be included to address each of these areas. For external events, the subsection should specifically address any vulnerabilities, outliers, anomalies, etc. that are identified in the plant's IPEEE and identify how these conditions have been resolved for the current and EPU power levels and/or demonstrate the acceptability of their risk impacts. For shutdown operations, in addition to CDF and LERF impacts (if a shutdown PRA exists), the subsection should address the plant's shutdown risk management philosophy and controls, impacts of the EPU on shutdown conditions, and any critical, time-limited, conditions. As

affected by the EPU, both subsections need to address any changes in success criteria and operator actions. The subsection on PRA quality should address the adequacy of the plant's PRA models to reflect the as designed, as-operated plant and specifically address any weaknesses etc. identified in the IPE, IPEEE, the staff SERs on the IPE and IPEEE, and any independent/peer/certification reviews (e.g., owners' group).

GE Response

The CLTR Section will be revised to address the above 5 RAIs related to PRA, consistent with the staff request.

NRC Request for Additional Information Set 2 ELEC

NRC RAI Set 3 Number 1 ELEC

The increased power from the main generator may impact the grid stability. This increased power in MW electrical due to power uprate affects the supply of reactive power (MVAR) from the main generator. The decrease in MVAR output from the main generator affect the voltages on the grid as well as the voltages to the associated nuclear power plant. The MVARs cannot be handled by administrative controls or distribution logic as stated in NEDC-33004P. GE should state that how the MVARs will be provided. The MVAR can be provided by installing power system stabilizers, capacitor banks, synchronous phase modifiers, SVCs,STATCOM etc.

GE Response

A CPPU Power Uprate Safety Analysis Report (PUSAR) shell is used as the starting point in the preparation of plant specific CPPU PUSAR documents and reflects the expected level of details for each section.

sentences have been added to the CPPU Basis

NRC RAI Set 3 Number 2 ELEC

The increase in MW also would affect the protective relaying for the main generator. GE should address it.

GE Response

sentence has been added to the CPPU Basis

NRC RAI Set 3 Number 3 ELEC

There will be a load increase for recirculation pumps, condensate pumps, condensate booster pumps etc. GE should address whether the loads will be increased or not.

GE Response

The CPPU Effect has been expanded

NRC RAI Set 3 Number 4 ELEC

Environmental qualification of electrical equipment should also be addressed.
Per 10/24/01 Meeting, this RAI is withdrawn.

NRC Request for Additional Information Set 4 SPSB

NRC RAI Set 4 Number 1 SPSB

The staff has identified some potential CPPU impacts that affect inputs to radiological analyses. These impacts are expected to be plant-specific in that they may not affect all boiling water reactors (BWRs). While § addresses the need for plant-specific analyses of the impact of the CPPU on design basis accident (DBA) radiological consequences, the focus is primarily on scaling existing UFSAR doses by the percentage power increase. The discussion in § and in the referenced Appendix H downplay impacts on the transport of radioactivity. To ensure that these transport aspects are not overlooked in the plant-specific analyses by those facilities affected, the impacts should be discussed in the applicable CPPU Effect and CPPU Basis text. If they can be dispositioned generically, the evaluations supporting the dispositions should be provided. The staff feels that the broad discussion in § will not ensure that the needed evaluation of these potential impacts is performed.

GE Response

As a general statement, the transport of fission product activity under design basis accident conditions when analyzed under TID-14844 related regulations and standard review plans is specified by bounding technical specifications or regulatory guidance which does not change as a result of power uprate.

In the case that a plant is relicensed or is relicensing under Regulatory Guide 1.183 This is not clear in the current CLTR, therefore, Section will be rewritten to address 10 CFR 100 issues separately from 10 CFR 50.67 issues. Revised introductory paragraph :

With respect to the questions concerning issue of transport of radioactivity, Section will be modified to specifically address primary issues of transport analysis such as MSIV leakage, suppression pool pH, etc.

NRC RAI Set 4 Number 1 Continued

Several BWR facilities have credited fission product deposition in main steam lines as a means of supporting increased main steam isolation valve (MSIV) leakage. While many of these evaluations are based on NEDC-31858P, some BWRs have used a different methodology (e.g., Polestar proprietary). Aspects of these methods are sensitive to steam conditions.

As such, it is the *containment* temperature and pressure that characterizes the MSIV leakage, rather than the dome pressure. While the latter is not changed in a CPPU, the former is changed.

GE Response

For plants which have been analyzed using the Polestar proprietary method, reanalysis may be required. GE is unfamiliar with the Polestar methods and can draw no specific conclusions. As to the analysis applied in accordance with NEDC-31858P, note that this technology is proprietary to General Electric and should be treated so.

Under power uprate conditions, assuming no other changes in analysis or plant configuration, the containment pressure and temperature characteristics would result in containment volumetric leakage rates via the MSIVs not larger than that of the pre-uprate condition due to the proportional increase of temperature and pressure with the additional energy applied to the containment from power uprate. Any changes in either analysis methods or plant conditions such as heat exchanger sizing would result in differences in the radiological analysis transport calculation.

Section of the CLTR addresses the mechanical aspects and specifications of the MSIVs and not the radiological transport analysis. clarify this part of the question as well as subsequent parts,

NRC RAI Set 4 Number 1 Continued

Increases in decay heat that result in changes in post-LOCA containment and suppression pool temperatures can affect the performance of containment spray systems with regard to fission product removal in those facilities that credit such removal in their DBA analyses.

GE Response

The use of containment sprays is applicable to calculations involving Regulatory Guide 1.183/Alternate Source Term analysis.

NRC RAI Set 4 Number 1 Continued

Some BWR facilities which have implemented an alternative source term (AST) have performed detailed analyses of post-LOCA flow paths between the drywell / wetwell (and containment in Mk III's) in establishing credit for suppression pool scrubbing of fission products, or wetwell bypass in Mk III's. Some of these analyses were performed using MAAP. One BWR has used such evaluations to establish the amount of drywell atmosphere mixing in support of containment spray fission product removal modeling. It is believed that changes in containment environmental conditions due to CPPU will impact these evaluations.

GE Response

The use of suppression pool scrubbing referred to is applicable to calculations involving Regulatory Guide 1.183/Alternate Source Term analysis.

will be added to the new Section as is shown above
).

NRC RAI Set 4 Number 1 Continued

RG 1.183 allows facilities, including BWRs, to credit post-LOCA natural deposition of fission products within the containment. Such deposition is sensitive to containment temperature and may be impacted by the increase in decay heat.

GE Response

The use of Regulatory Guide 1.183/Alternate Source Term analysis will be addressed by adding a new Section and the issue will be addressed in this section as is shown above
).

NRC RAI Set 4 Number 1 Continued

The licensing basis DBA LOCA analyses at some BWR facilities have analyzed the radiological consequences of releases associated with combustible gas control systems. One such facility has considered intentional releases from the containment atmosphere depressurization (CAD) system at 24 hours post-LOCA. Section states that increased radiolysis may make it necessary to take actions earlier than previously considered. If the time reduction is significant, the reduction in available time for radioactive decay could increase the doses associated with these planned releases. The earlier release may require use of a more restrictive atmospheric dispersion value.

GE Response

The use of intentional releases in DBA LOCA cases would need to be addressed
Such an analysis would be conducted in accordance with the revised specification of Section .

NRC RAI Set 4 Number 1 Continued

Some BWR facilities, which have implemented an alternative source term, have credited the use of the standby liquid control (SLC) for establishing and maintaining the suppression pool pH greater than 7. These facilities have performed analyses of the pool pH considering all possible sources of acids and bases, including radiolysis, within containment during a LOCA. With the increase in reactor power, radiolysis can be expected to increase. Also, containment environmental conditions are different. These differences could impact the projected pH.

GE Response

The use of standby liquid control systems referred to is applicable to calculations involving Regulatory Guide 1.183/Alternate Source Term analysis and is addressed in Section . See text above (reply to).

NRC RAI Set 4 Number 2 SPSB

CPPU Effect

This section need to be expanded to address additional possible effects:

"The increase in core inventory is expected to increase previously analyzed control room operator radiation doses from increased intake of contaminated air, from containment radiation shine and from radiation shine from the overhead airborne plume (external). Increases in core inventory by CPPU also increases the activity present at control room ventilation filters and increases the filter loading. This filter loading can reduce the effectiveness of the filter for removing iodine and can increase the amount of radiation shine emitted from the filter housing."

GE Response

Section , "Main Control Room Atmosphere Control System," provides the assessment of the effect of power uprate on the system performance. The primary effect is on the filter loading due to the increased iodine inventory in the core.

A CPPU Power Uprate Safety Analysis Report (PUSAR) shell is used as the starting point in the preparation of plant specific CPPU PUSAR documents and reflects the expected level of details for each section.

The impact of CPPU on operator exposure is covered in Section . The CPPU PUSAR shell for Section will be updated to include a discussion of the treatment of the radiation shine from the airborne plume, containment, and filter housing.

NRC RAI Set 4 Number 3 SPSB

CPPU Bases

The staff expects that this will be done on an accident specific basis for all DBAs considered in the UFSAR. Focusing on a limiting release omits consideration of the following accident-specific aspects of assessing control room doses:

- Difference in timing of releases for each accident relative to control room emergency ventilation actuation timing
- Differences in atmospheric dispersion coefficients due to different release points for each accident (e.g., different upwind distances, directions, and release elevation)
- Differences in method of control room emergency ventilation actuation for each accident, and actuation delays associated with each method.

GE Response

Section , "Main Control Room Atmosphere Control System," provides the assessment of the effect of power uprate on the system performance. The primary effect is on the filter loading due to the increased iodine inventory in the core.

A CPPU Power Uprate Safety Analysis Report (PUSAR) shell is used as the starting point in the preparation of plant specific CPPU PUSAR documents and reflects the expected level of details for each section.

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The second sentence in the CPPU Basis for Section , "Main Control Room Atmosphere Control System" has been changed

NRC RAI Set 4 Number 4 SPSB

Section

The last paragraph needs to be revised to clarify who is allowed to credit the AST conclusions.

" ...1) SGTS at facilities that have received approval under 10 CFR 50.67 to implement an Alternative Source Term, and 2)SGTS at facilities committed to Regulatory Guide 1.3 for fission product transport.."

GE Response

CLTR Section text will be revised as suggested.

NRC RAI Set 4 Number 5 SPSB

The clarity of the table on page would be improved if the numeric values were as appropriate.

GE Response

The subject CLTR table will be revised as suggested.

NRC RAI Set 4 Number 6 SPSB

In the table, please explain why the normal air flow specified for the RG 1.183 case is less than the normal air flow specified for the RG 1.3 . The flow rate is a function of plant design and all BWR facilities may request use of an AST under 10 CFR 50.67.

GE Response

We agree that the air flow rate is a function of plant design. However, due to the differences in fission product transport assumptions, plants applying ASTs can maintain components below the appropriate temperature limit with a lower flow rate than plants utilizing RG 1.3 with TID14844 source terms.

NRC RAI Set 4 Number 7 SPSB

While a minimum air flow appears to be conservative with regard to charcoal ignition concerns, the staff believes that the maximum flow rate would result in a greater deposition of fission products on the filter. Has a sensitivity analysis been performed to arrive at the flow values in the table? The staff notes that Browns Ferry assumes filtered SGTS flow of 22,000 cfm in its LOCA analysis.

GE Response

No sensitivity analysis is required because the assumption

NRC RAI Set 4 Number 8 SPSB

, below table

Since the aerosol content associated with an AST is greater than that for the traditional source term, it would appear that the stated conclusion would also be valid for the RG 1.3 source term. As such, the staff does not believe that there is a need for an acceptance criteria as an alternative to the 2.5 mg/gm value of RG 1.52 as done in paragraph 4 on .

GE Response

Application of AST assumes only 5% of the iodine is non-particulate (elemental plus organic) and reaches the adsorber (versus 95% for RG 1.3). In addition, AST assumptions include a provision to account for plateout of aerosols on primary containment surfaces, as well as removal by containment sprays, recirculation filters, and suppression pool scrubbing under certain conditions. Iodine transport to the SGTS adsorbers is therefore substantially lower for AST applications. In addition, many older plants are not committed to the iodine loading design criterion of RG 1.52. Therefore, these plants may not meet the 2.5 mg/gm loading criterion, either for original licensed thermal power or uprate power, when not applying AST.

A recent EPU application that required evaluation of the SGTS at iodine loading above 2.5 mg/gm has been reviewed and approved by the staff.

NRC RAI Set 4 Number 9 SPSB

The staff believes that this item must be dispositioned by the performance of a core inventory assessment using ORIGEN or similar generation-depletion analysis codes, using the proposed rated thermal power plus uncertainty, and licensed (or proposed) values of burnup, enrichment, and fuel design. Cross-section libraries used in this assessment should be consistent with the fuel design and projected burnup.

GE Response

This inventory is provided in terms of Activity per MWt

Typically such inventories are used to (1) verify shielding calculations and (2) accident release calculations

A paragraph will be added to Section to qualify use of this inventory:

NRC RAI Set 4 Number 9a SPSB

GE states in the first paragraph:

The staff believes this statement to be valid only if the rated thermal power is the only difference between the pre-CPPU and post-CPPU evaluation. That is, in order for this statement to be correct, the current licensing basis source term would have been calculated assuming the enrichment, fuel type, and projected burnup, that will be applicable after the uprate. The staff notes that its finding of acceptability with regard to public safety is based on the final projected dose and not on the incremental increase in dose.

GE Response

See reply above. The inventory as is shown in Section presents a set of conditions for current reactor conditions to which this CLTR is to be applied.

NRC RAI Set 4 Number 9b SPSB

The staff's experience in reviewing license amendment requests indicates that some licensees are currently using the same source term that was used at the time of original plant licensing. The staff has identified licensees using the Ci/MWt values from TID14844, issued back in 1956 when enrichments and burnups were significantly different than they are today. The staff believes that these source terms were never updated as the new fuel design proposals over the years have generically dispositioned with the changes declared as being negligible. However, analyses performed for two recent extended power uprates (EPUs) of about 18% thermal power found increases in iodine of 26% or more (perhaps the cumulative effect of not updating the source term for previous fuel product changes). The staff is aware of many control room habitability analyses in which a difference of this magnitude would result in control room doses exceeding General Design Criterion-19.

GE Response

The calculation for compliance with GDC 19 concerns the operator dose commitment based upon specific releases of radionuclides of iodine, krypton, and xenon (note this is a TID-14844 reference and not an AST reference).

NRC RAI Set 4 Number 9c SPSB

The staff does not believe that this analysis can support the conclusion stated in the 1st paragraph, since the analysis does not consider the source term currently in use at the facility. However, many BWRs have cores comprised of fuel from mixed vendors. that would prevent a licensee from using this topical report.

GE Response

Please see replies above.

A paragraph will be added to Section to qualify use of this inventory.

NRC RAI Set 4 Number 10 SPSB

, last ¶

This paragraph should read:

"The results of the assessment will be used in performing analyses identified in § ."

GE Response

The last paragraph of Section will be replaced with

"

NRC RAI Set 4 Number 11 SPSB

, 1st ¶

The second sentence states that "... *assessment is provided...*" Yet, each item is identified in the table .

GE Response

The word will be deleted and replaced by: 2nd sentence of 1st paragraph of Section

NRC RAI Set 4 Number 12 SPSB

, CPPU Basis

confirming the conclusion *"...typically significantly exceeds potential increases..."* needs to be added.

GE Response

The last sentence of Section will be changed

"

"

NRC RAI Set 4 Number 13 SPSB

, CPPU Basis

confirming the conclusion *"...are not expected to exceed the design basis concentrations..."* needs to be added

GE Response

The last sentence of Section will be changed

NRC RAI Set 4 Number 14 SPSB

The staff believes that "Post-accident radiation levels" topic is inadequately defined. The staff suggests that the following text be added to the CPPU Basis:

" evaluation of the impact of the increased core inventory on commitments made relevant to NUREG-0737 items (for which dose calculations were made) needs to be performed . Examples include: post-accident sampling system, post-accident vital area access, post-accident effluent radiation monitors, and technical support center habitability."

GE Response

The third paragraph of Section , CPPU Basis will be replaced

"

"

NRC RAI Set 4 Number 15 SPSB

As discussed previously for , the staff disagrees with assertion that post-accident radiation levels will increase by .

GE Response

This paragraph has been deleted, see item above.

NRC RAI Set 4 Number 16 SPSB

As discussed previously for , the staff disagrees that the worst case accident with regard to control room habitability is presumably the LOCA.

GE Response

This paragraph has been deleted, see item above.

NRC RAI Set 4 Number 17 SPSB

The staff has reviewed Section 5.4 and Appendix H of extended power licensing topical report Volume 1 (ELTR1) and cannot agree with the analysis methodology described therein. The staff recognizes that ELTR1 was approved by the staff. However, the staff is reconsidering its previous approval as it applies to the evaluation of the impact of CPPU on DBA accident doses. Appendix H states:

"The basic premise of the power uprate radiological / radiation evaluations is that the existing calculations as shown in the current Safety Analysis Reports (SARs) are valid."

The staff believes that this premise may not be appropriate for all facilities. The staff's experience in reviewing license amendment requests indicates that some licensees have analysis based on outdated source terms and incorporating analysis inputs and assumptions no longer deemed acceptable to the staff. The staff is required to make a current finding that reasonable

assurance that the public health and safety will not be impacted by the CPPU. The staff has not generically requested that licensees update their analyses for changes in regulatory guidance. However, there is no technical or regulatory basis for the staff to accept a licensee-proposed CPPU amendment that will ascerbate the existing analysis deficiencies with a 20%+ increase in core inventory. As examples:

- Many early BWR LOCA analyses allowed the applicant to sum MSIV and drywell leakage and treat them together as being components of the 2% volume/day drywell leakage. As such, these analyses route all leakage through the standby gas treatment system (SGTS) and out the elevated release point. This approach underestimates the dose due to the MSIV leakage since the MSIV leakage would not be routed through SGTS (factor of 20 to 100 increase) and would not be an elevated release (factor 100-1000 increase).

- Most early BWR LOCA analyses do not assess leakage from recirculation systems outside of containment.

- Control room analyses are often limited to the LOCA only.

In many licensing topical reports involving radiological consequence analyses, GE has typically performed an analysis using a set of analysis inputs deemed to be bounding for all BWR facilities and using the current regulatory guidance in regulatory guides and standard review plans. Appendix H does not require facilities to use current regulatory guidance. Instead, Appendix H directs facilities to

, without regard to the acceptability of the current analyses. As such, the staff cannot conclude that the doses would represent the true impact of the CPPU.

The staff believes that the following protocol is warranted for plant-specific evaluations:

a. As described in § , All applicants under the CPPU LTR should generate a core inventory based on the post-CPPU rated thermal power plus 2% uncertainty, current authorized enrichment and burnup, fuel design, and fuel management (for exposure periods) using ORIGEN or other industry accepted generation and depletion code. This source term will be documented in the UFSAR by isotope and will become the design basis for evaluations performed in support of the CPPU submittal and in subsequent radiological analyses intended to demonstrate compliance with 10 CFR 100 or 10 CFR 50.67, as applicable, and with 10 CFR 50 Appendix A GDC-19.

b. The methodology described in Appendix H is acceptable only if the current UFSAR analyses meet the guidance of current versions of applicable regulatory guides and/or current versions of applicable sections of the standard review plan (SRP) except where the facility can show that the staff has explicitly accepted an alternative to the regulatory guidance for that facility in an SER.

c. If the current UFSAR analyses do not meet the criteria of paragraph b above, the CPPU applicant must re-perform the DBA analyses currently considered in the UFSAR, using the guidance of current versions of applicable regulatory guides and SRP sections. Facilities

may propose technically supportable alternatives to the applicable guidance for staff consideration.

d. Radiological analyses will estimate exclusion area boundary, low population zone, and control room doses for all DBA accidents considered in the UFSAR. Control room analyses will incorporate parameter values consistent with the current control room design and operation, and will incorporate unfiltered inleakage determined by integrated control room envelope integrity testing. Habitability conclusions based on comparison to an analyzed limiting accident must address accident-specific differences in accident progression, source term, release mitigation, release point location and height, release point X/Qs, and control room emergency ventilation actuation means and associated instrument response delays.

e. Since the staff must make a finding of acceptability based on the applicant's analyses and evaluations, the CPPU amendment request must describe the methodology used in the analyses, and must tabulate all input values and assumptions used in the analyses and evaluations in sufficient detail for the staff to confirm the acceptability of these analyses and evaluations. While the staff may perform confirmatory calculations, the basis for acceptance is the applicant's analyses and evaluations.

GE Response

It is not in GE's scope to address NRC policy with regard to evaluating facilities to standards not in their current licensing basis. However, with respect to the evaluations recommended in the RAI:

a. A core inventory
is provided
Such an inventory provides a reasonable level of accuracy for calculations required.

b. Appendix H of the ELTR1 states that

This is only a statement of general applicability.

For those areas and cases where radiation dose rates are
as is stipulated in Sections of the CLTR. This will be reflected in the CLTR
. See Item c for applicability to regulatory guides and SRP.

c. The PUSAR shell will be updated to include a description consistent with the following

- Facilities where the current UFSAR analysis basis does not meet the guidance of current versions of applicable regulatory guides and/or current versions of the applicable sections of the SRP, unless explicitly accepted by the NRC staff, should

review their proposed approach for dose analysis with the staff to ensure the CPPU application approach is acceptable to the NRC.

The CLTR will be updated

e. Addressed in Item d.

NRC RAI Set 4 Number 18 SPSB – NA

NRC RAI Set 4 Number 19 SPSB

With regard to the control rod drop accident (CRDA), fuel damage in the form of cladding breach and pellet melting is projected in DBA analyses. What is the impact of increased power on the amount of fuel which is damaged? This needs to be dispositioned.

GE Response

The Control Rod Drop accident is dispositioned . In fact there will not be a significant difference since the power increase will be spread over a large number of bundles and the applied peaked bundle should not increase. This does not necessarily apply to a coincident

change in fuel type

NRC RAI Set 4 Number 20 SPSB

The staff finds the of the main steam line break accident (MSLBA) and instrument line break accident (ILBA) to be generally acceptable if there have been no changes in fission product transport parameters . The staff is aware that there may be facilities that have MSLBA and ILBA analyses performed either by the utility or by a third-party, that may differ in analysis assumptions. The staff believes that GE should identify the significant assumptions made in these generic depositions and request that users of the CPPU LTR confirm that their analyses are bounded by the GE deposition. For example, in the bulleted lists for the two MSLBA cases include: "Mass release based on choked flow rate through main steam line restrictor."

GE Response

Specific assumptions along with references to radiological evaluation methodology will be added to the CLTR under Section .

- Analysis follows the guidance of the following references:

Careway, H.A. "Radiological Accident Evaluation – The CONAC04A Code", GE Document NEDO-32708, Class I, August, 1997.

Careway, H.A. "Control Room Accident Exposure Evaluation – CRDOS Program", GE Document NEDO-32709, Class I, August, 1997.

NRC RAI Set 4 Number 21 SPSB

While the LOCA, FHA, CRDA, MSLBA, and ILBA represent the typical DBA analysis set, the staff is aware that the UFSARs for some facilities have other DBAs that address radiological consequences, for example, gaseous waste system failures. Provision needs to be made in this section for the evaluation of additional DBAs, if any, in the facility's licensing basis.

GE Response

Section will be modified . Section modification for Section in the reply to RAI #1

NRC RAI Set 4 Number 22 SPSB

As noted in the discussion for § , this evaluation must use the core inventory in determining whether the plant environmental envelope for radiation is increased. This should be specified.

GE Response

The core inventory calculated using the methodology described in Section is intended to provide a core inventory source term. This approach provides a measure of conservatism in the analysis.

NRC RAI Set 4 Number 23 SPSB

The staff notes that it is currently working on an generic regulatory initiative to address identified deficiencies in control room habitability. When these generic requirements are issued, they will be applicable to all BWR facilities. Since this topical report may be approved prior to issuance of these generic requirements, the staff is not requesting that it be specifically identified in the CPPU LTR. The staff is noting, however, that this generic initiative is expected to require plant-specific actions. The staff's approval of this CPPU LTR will not exempt BWR facilities from these actions.

GE Response

It is recognized that there are on-going discussions between the staff and industry regarding control room habitability. Although the calculated control room exposure may increase due to CPPU, the current regulatory limits will be met. It is anticipated that any new regulatory requirements regarding control room habitability will be treated consistently for all plants.

NRC RAI Set 4 Number 24 SPSB

3rd bullet

Please revise to read "...compared to the criteria of 10 CFR 100 or 10 CFR 50.67, as applicable, and 10 CFR 50, Appendix A GDC-19."

GE Response

Section , the 3rd bullet will be revised

NRC RAI Set 4 Number 25 SPSB

This section may need to be revised for consistency with the revised § .

GE Response

Section will be consistent .

NRC RAI Set 4 Number 26 SPSB

Please revise to read "...and meet the criteria of 10 CFR 100 or 10 CFR 50.67, as applicable, 10 CFR 50, Appendix A, GDC-19, and other plant specific acceptance limits."

GE Response

Section , the 3rd bullet will be revised

Attachment Supporting Response to Question 9

NRC Request for Additional Information Set 5 SPLB

NRC RAI Set 5 Number 1 SPLB

Section of the topical report describes that vibration testing of will be performed during initial operation at the uprated power level. Describe how the acceptance criteria will be determined for these tests and how operation at acceptable vibration levels would affect the probability of fatigue failure of branch piping connections relative to operation at the original power level.

GE Response

For piping vibration testing, the acceptance criteria are associated with the allowable design alternating (vibration) stress levels. The steady state flow induced vibration (FIV) maximum stress levels must remain below the endurance limit of the piping material. This is because many cycles of vibration will be encountered over the remaining design life of the plant. The ASMS design fatigue endurance limit for steady state alternating stresses from vibration is 13,600 psi (zero to peak) for austenitic (stainless) steel piping materials. The design fatigue endurance limit for steady state alternating stresses from vibration is 7,690 psi (zero to peak) for carbon steel piping materials. These fatigue design endurance limits were taken from ASME Pressure Vessel and Piping Code, Section III, Division 1 – Appendix I, Figure I-9.2.2, 1989 and the American National Standard, OM S/G 1997, "Requirements for Preoperational and Initial Startup Vibration Testing of Nuclear Power Plant Piping."

The vibration sensor locations and directions for the large bore piping are selected based on dynamic modal analysis and engineering judgment. A dynamic modal analysis of the large bore piping is performed over the piping sections of interest. The modal analysis identifies locations and directions where the piping is most likely to respond. Once the sensor locations are selected, then the modal analysis can be used to establish appropriate acceptance criteria for these locations, corresponding to the maximum allowable vibration stress, such as 7690 psi for the carbon steel piping.

As far as evaluation of branch lines is concerned, it is noted that typically the measured piping vibration levels of the piping are only a few percent of these criteria. Hence, the vibration levels of the large bore piping are small and therefore the vibration levels of components and branch piping attached to the large bore piping are not of concern. However, if during testing, the vibration levels of the large bore piping are found to be significant then the attached components and branch piping connections will have a higher probability of fatigue failure relative to operation at the original power level. Hence when the measured large bore piping vibration levels reach their acceptance criteria, the attached branch piping connections will be further evaluated.

NRC RAI Set 5 Number 2 SPLB

Sections of the topical report describe that the flow, pressure, and temperature in the piping will increase. Because original piping code analyses have varied in scope, address how these piping systems will be evaluated for potential increases in dynamic effects from the following expected operational occurrences: turbine control valve closure (trip); main steam isolation; main feedwater isolation; and relief valve actuations.

GE Response

The piping systems will be evaluated for potential increases in dynamic effects from the expected operational occurrences due to turbine control valve closure (trip), main steam isolation, main feedwater isolation, and relief valve actuations

NRC RAI Set 5 Number 3 SPLB

Section of the topical report states that off gas piping is by power uprate. Considering the increased rate of radiolytic decomposition of water at the uprated power level, describe the basis for concluding that off gas system flow, temperature, and pressure are

.

GE Response

Offgas piping temperatures between the recombiner and offgas condenser are . the original margin for radiolysis as used for design of offgas piping and components is relative to actual plant performance.

The analysis in Section will confirm that temperatures and pressures remain below original design values at which the piping analysis was performed. To ensure that the offgas piping is adequately dispositioned, the entry bullet for offgas in the CLTR will be removed.

NRC RAI Set 5 Number 4 SPLB

The standby gas treatment filtration and ventilation system is analyzed in Section of the licensing topical report. It states,

A table of parameters and values is presented in Section of the topical report. Based on review of the above statement and information documented in the topical report, the staff requests the following additional information:

2. Provide any additional relevant parameters and their values that should be included in the Section table of the licensing topical report, such as the of charcoal per adsorber train discussed in the section narrative.
3. Explain whether values identified in the Section table are .

(The licensing topical report evaluation addressing potential issues in Section related to verification of iodine loading on charcoal adsorbers that may exceed Regulatory Guide 1.52 limits, and verification of alternate source term implementation, and any impact on offsite dose analysis should be addressed by others (SPSB/DSSA)).

GE Response

1.

2. To provide all relevant parameters used in the analysis, the CLTR Section table is revised

In addition, the first two paragraphs below the table are revised for clarity .

"

"

3. Value limits are added as requested (see revised table above).

NRC RAI Set 5 Number 5 SPLB

Section of the topical report describes that the increase in steam flow can change the turbine missile avoidance

. However, the increased steam flow and related turbine modifications could increase the frequency of turbine overspeed events involving turbine blade failure_

. These events have the potential to disable the main condenser and initiate turbine building fires. Describe how the main turbine and its overspeed protection system will be evaluated relative to these events for operation at the uprated power level.

GE Response

Frequency of overspeed events is dependent on the design and testing of turbine control and protection system. These systems are generally unchanged for power uprates. Therefore, the frequency of overspeed events is not expected to change. If the turbine control and protection system is modified during the implementation phase, any changes will be evaluated in accordance with the requirements of 10CFR50.59.

For large power uprates, the rotating elements of the turbine are frequently modified. The entrapped energy following a turbine trip or load rejection increases slightly for CPPU. However, the turbine overspeed remains within limits.

many power plants have replaced high pressure and low pressure shrunk-on rotors with an integral rotor without shrunk-on wheels.

The second paragraph of the CPPU basis for Section , "Turbine Generator" has been revised to read:

"

NRC RAI Set 5 Number 6 SPLB

Section of the topical report describes that feedwater and condensate system flow rates will increase for operation at the uprated power level, and that plant specific system modifications may be required. Describe to what extent the effects of flow accelerated corrosion should be addressed .

GE Response

Balance of plant piping is evaluated as described in Section .

A CPPU Power Uprate Safety Analysis Report (PUSAR) shell is used as the starting point in the preparation of plant specific CPPU PUSAR documents and reflects the expected level of details for each section.

Flow assisted corrosion is covered consistent with the Licensee's current program requirements.

NRC RAI Set 5 Number 7 SPLB

Section of the topical report describes main (main added as clarification from 11/15/01 telecon) steam line breaks.

clarify how the reactor protection system, ESF isolation logic, and turbine pressure control system interact through the progression of a steam line break event .

GE Response

The only safety system or normal operating system intervention, assumed in the analysis that affects the mass and energy release, is the closure of the main steamline isolation valves (MSIVs).

The reactor initially becomes subcritical due to the void generation in the core. The position switches on the MSIVs initiate scram as the valves are closing (~10% closed). The reactor remains subcritical throughout the event. The safety/relief valves (SRVs) will operate to limit the pressure increase following main steamline isolation. If feedwater is not available, reactor inventory is maintained by the reactor core isolation cooling (RCIC) system or high pressure coolant injection system/high pressure core spray (HPCI/S) system, initiated on low water level (Level 2) due to the inventory lost through break and continuing loss the operation of the SRVs. The RCIC or HPCI/S system startup does not occur until after the MSIVs are fully closed.

NRC Request for Additional Information Set 6 IRSB

NRC RAI Set 6 Number 1 IRSB

In Sections (Crud Activity and Corrosion Products) and (Radiation Levels), the phrase "Past Power uprates have demonstrated" was used as a basis for drawing apparently reasonable technical conclusions. Provide a summary of the technical background and supporting information for these conclusions. Include in your response which plants were studied, what data were examined, what time periods were considered, what assumptions were used, and the rationale for the conclusions.

GE Response

A CPPU Power Uprate Safety Analysis Report (PUSAR) shell is used as the starting point in the preparation of plant specific CPPU PUSAR documents and reflects the expected level of details for each section.

Because core flow is unchanged, the deposition of corrosion products on fuel during the operating cycle is expected to be unchanged. An equilibrium layer would be established and the release of crud to spent fuel pool would not be expected to change. Minor changes in released crud can be accommodated by the Fuel Pool Cleanup system.

Although the CPPU increases the activity of the crud layer on spent fuel, regarding exposure is that occupational exposure is an operational consideration and is managed independent of the increase in CPPU power level to meet existing plant operational goals, standards and requirements.

NRC RAI Set 6 Number 2 IRSB

In Section , under CPPU Basis, in the third paragraph, you provide of activated corrosion products in liquid wastes and solid processed wastes. Describe the technical bases_ . Provide a summary of the technical background and supporting information for these conclusions. Include in your response which plants were studied, what data were examined, what time periods were considered, what assumptions were used, and the rationale for the conclusions.

GE Response

The methodology for estimating the liquid and solid waste change used in previous power uprate evaluations is based on a plant specific assessment of previous cycle waste quantities.

The range of values cited in the CLTR represent results from a variety of operating plants with different amounts of uprate and different waste management practices.

The CLTR will be changed,

NRC RAI Set 6 Number 3 IRSB

In Section (Gaseous Waste Management) under CPPU Basis, you state that, "the radiological release rate is administratively controlled to remain within existing limits, and is a function of fuel cladding performance,..." and several other factors. Aside from limiting power (to the point of shutting down the plant, assuming gross fuel leakers, etc.), how can an operator administratively control gaseous effluents from the main condenser offgas during plant operation?

GE Response

The reference to administrative control of radiological release is a general statement regarding the facility's commitment to limit offsite release and dose in accordance with the Administrative Controls sections of plant Technical Specifications and the control procedures as may be identified in the Offsite Dose Calculation Manual (ODCM). Possible control actions include reduction of power, insertion of selected control rods, isolation of release pathways, or plant shutdown. No specific operator actions are available within the offgas system to limit gaseous effluents other than reduction of main condenser air inleakage to improve holdup times or system isolation.

NRC RAI Set 6 Number 4 IRSB

Section (Coolant Activation Products) states that the increase in activation production (of N-16, primarily) is . It further states that the concentration (of N-16) in the steam . This would imply that the external radiation levels at the turbine (and in the steam lines, etc.) . Section (Normal Operation Off-Site Doses) states, however, that "the increase in steam flow results in higher levels of N-16 and other activation products in the turbines" and that this leads to "higher radiation levels in and around the turbines and offsite skyshine dose." Please clarify this apparent inconsistency. If the N-16 levels are expected to increase in the reactor coolant, the wording in Section should be modified to state this and to provide the reason for the increase (less decay time due to higher steam flow rates?) and for the percentage increase in N-16 dose rates in the turbine building.

GE Response

Radiation levels in the steam lines, turbine, and condenser will increase

the steam flow rate increase reduces the decay time between the core and measurement point, whether it be the steam line, turbine, or condenser decreases, resulting in higher inventories of the activation products and resultant higher dose rates.

The fifth sentence under CPPU basis will be revised

Add to the end of this CPPU Basis paragraph:

NRC RAI Set 6 Number 5 IRSB

In Section (Fission Products), the CPPU Effect section states that fission products will increase with increases in reactor power. However, the conclusion of the CPPU Basis reaches

. Additionally, in Section (Normal operation off-site doses), it is clearly stated that effluent releases increase in proportion to power increases. Please clarify these apparent inconsistencies.

GE Response

As a practical consideration, the measured radiation levels in a plant will increase due to power uprate. However, the design basis concentration radionuclide concentration levels are not changed by the CPPU and therefore analysis based upon these levels are unaffected by CPPU. Section will be revised to clarify this point (changes in italic):

The first sentence of CPPU Basis under Section will be revised

NRC RAI Set 6 Number 6 IRSB

In Section (Radiation Levels), the point is made that the original designs for most plants are sufficiently conservative to compensate for increasing radiation levels from power increases. With the advent of hydrogen water chemistry (HWC) and the resultant 3-5 factor increase in radiation levels due mainly to N-16 in and around the turbine/steam components, did not this increase in radiation levels take away a significant portion of the original plant shielding/layout designed margin/conservatism? If that is the case (and noting that some plants have not elected to use noble-metals injection process (NMIP), which results in significantly lower levels of N-16), then provide justification for why non-NMIP, HWC plants with large EPUs will not have to change radiation zoning and/or shielding?

GE Response

There is no blanket justification why non-NMIP, HWC plants with large EPUs will not have to change radiation zoning and/or shielding. As part of the EPU process there will be evaluation of changes, in the dose rates.

NRC RAI Set 6 Number 7 IRSB

In Section post-accident radiation levels (PARL) are estimated The NRC staff noted during their individual plant EPU reviews that PARL calculations show an increase in the range of 11-45% for an EPU of 18%. This should be noted in this section. Additionally, the licensees should be reminded that a plant specific assessment of the PARL will be needed to demonstrate continued compliance with NUREG-0737, Item II.B.2. (Shielding design review for post-accident vital area access/occupancy).

GE Response

The third paragraph of Section , CPPU Basis will be replaced

NRC RAI Set 6 Number 8 IRSB

Section (Normal Operation Offsite Doses) should specifically reference EPA's environmental dose standard, 40 CFR 190 (cited as a requirement in 10 CFR Part 20.1301(d)). This regulation is particularly pertinent, relative to the N-16 skyshine component offsite. Additionally, in the last sentence of this section, please explain what you mean (and provide examples) when you say that local regulations must be complied with if HWC is in use.

GE Response

The requirement to add 40 CFR 190 will be added to the last paragraph of Section . All references to "local regulations" will be deleted. The last paragraph of Section will be revised

General Electric Company

AFFIDAVIT

I, George B. Stramback, being duly sworn, depose and state as follows:

(1) I am Project Manager, Regulatory Services, General Electric Company ("GE") and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.

(2) The information sought to be withheld is contained in Attachments 1 through 6 to letter MFN 01-069, JF Klapproth to NRC, *Responses to Draft Request for Additional Information (RAI) to Licensing Topical Report NEDC-33004P, Revision 1*, dated December 3, 2001. The proprietary information in Attachments 1 through 6 (GE Company Proprietary), is identified by double underlining of the specific material.

(3) In making this application for withholding of proprietary information of which it is the owner, GE relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), 2.790(a)(4), and 2.790(d)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

(4) Some examples of categories of information which fit into the definition of proprietary information are:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of General Electric, its customers, or its suppliers;

d. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, of potential commercial value to General Electric;

e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in both paragraphs (4)a. and (4)b., above.

(5) The information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GE, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GE, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within GE is limited on a "need to know" basis.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information identified in paragraph (2), above, is classified as proprietary because it contains further details regarding the GE proprietary report NEDC-33004P, *Constant Pressure Power Uprate,* Revision 1, Class III (GE Proprietary Information), dated July 2001, which contains detailed results of analytical models, methods and processes, including computer codes, which GE has developed,

obtained NRC approval of, and applied to perform evaluations of transient and accident events in the GE Boiling Water Reactor ("BWR").

The development and approval of these system, component, and thermal hydraulic models and computer codes was achieved at a significant cost to GE, on the order of several million dollars.

The development of the evaluation process along with the interpretation and application of the analytical results is derived from the extensive experience database that constitutes a major GE asset.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GE's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GE.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GE would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

STATE OF CALIFORNIA)
)
COUNTY OF SANTA CLARA) ss:

George B. Stramback, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at San Jose, California, this 3rd day of December 2001.

George B. Stramback
General Electric Company

Subscribed and sworn before me this 3rd day of December 2001.

TERRY J. MORGAN
Commission # 1304914
Notary Public - California
Santa Clara County
My Comm. Expires May 18, 2005

Notary Public, State of California

NRC FORM 8C
(7-94)
NRCMD 3.57

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