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Subject: Westinghouse Owners Group
WOG Comments on Draft Regulatory Guide DG-1096 "Transient and Accident Analysis Methods" (DG) and the draft Standard Review Plan Section 15.0.2 "Review of Analytical Computer Codes"

Attached are the Westinghouse Owners Group comments on the Subject Draft Regulatory Guide, DG-1096, and draft Standard Review Plan, SRP15.0.2.

The attached feedback includes review and comment from both WOG member utilities and Westinghouse. These comments are being provided to the NRC in an attempt to ensure that the official Reg. Guide and SRP are documents that the industry can effectively implement, without incurring costs that are not commensurate with the safety significance, and that draw a clear distinction between "best estimate" and "conservative"/"bounding" analysis codes and methods.

If you have any questions regarding these comments, please contact David Huegle, Westinghouse, at (412) 374-5424 or email at huegelds@westinghouse.com, or myself at Tennessee Valley Authority, (423-751-8201).

Very truly yours,

Robert H Bryan

Robert H. Bryan, Chairman
Westinghouse Owners Group

attachment

Cc: N. Lauben, USNRC (1L, 1A)
Westinghouse Owners Group Primary Representatives (1L, 1A)
Westinghouse Owners Group Analysis Subcommittee Representatives (1L, 1A)
Westinghouse Owners Group Fuel Working Group Representatives (1L, 1A)
Westinghouse Owners Group Steering Committee (1L, 1A)
A.P. Drake, WOG Project Manager (1L, 1A)

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Cdd = AW Beidleck (AFB)
N. Lauben (E-MAIL)

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WOG Comments on Draft Regulatory Guide DG-1096 and
Draft Standard Review Plan Section 15.0.2

Introduction

The NRC staff has developed draft guidance to support the development and assessment of evaluation models that may be used to analyze transient and accident behavior (i.e., "Chapter 15" analyses). Public comments on the draft regulatory guide and draft standard review plan (SRP) section were requested by February 15, 2001. In response to this request, the Westinghouse Owners Group (WOG) has reviewed the NRC's draft Regulatory Guide DG-1096 "Transient and Accident Analysis Methods" (DG) and the draft Standard Review Plan Section 15.0.2 "Review of Analytical Computer Codes" and compiled the enclosed comments.

The stated purposes of these documents are to provide guidance for realistic ("best estimate") accident analyses which will provide a more reliable framework for risk-informed regulation and for estimating the uncertainty in understanding transient and accident behavior. The NRC is to be commended for its efforts to provide a detailed approach for the development of new codes and methods that will in the long run provide for a better overall understanding for both the NRC and the industry. The overall approach seems to be appropriate for "best estimate" more realistic type safety analyses. The DG contains a number of requirements, such as phenomena identification and ranking table (PIRT) evaluation, uncertainty analysis, code assessments, scaling analyses, etc. that would significantly increase the costs associated with developing new codes and methods for performing safety analyses. While it is understood that in some instances, these requirements are appropriate, it is believed that the application of these requirements should be based on complexity of the analysis and/or its importance to safety and risk significance. The DG indicates that this is the case when it states "*The risk-importance of the event or the complexity of the problem should determine the level of detail needed to develop and assess an evaluation model.*" is appropriate. The DG needs to be clear that this determination is the expectation not the rule. Concerns with the application of the DG to new codes and methods are captured within this document

The DG further states that "..the same process applies even if the new evaluation model is the result of relatively simple modifications to an existing evaluation model." While it is understood that the long term goal should be to adopt the principles provided in the DG for new "best estimate" code and method submittals thereby instilling greater confidence in overall submittal, the application of this approach to traditional "conservative" safety analysis methods and codes is not practical or cost effective given the marginal (if any) increase in plant safety. There are many concerns with applying the DG to existing traditional "conservative" codes and methods that should be considered.

The enclosed feedback from both utilities and Westinghouse is provided to the NRC, via NEI, in an attempt to ensure that the official Reg Guide and SRP are documents that the industry can effectively implement, without incurring costs that are not commensurate with the safety significance, and that draw a clear distinction between "best estimate" and "conservative"/"bounding analysis codes and methods.

DG-1096: General Comments

The following feedback is provided both with respect to the impacts of the DG on traditional "conservative" safety analyses as well as on new "best estimate" realistic safety analyses.

I. Implications for Existing Safety Analyses

It is recommended that the DG draw a distinction between traditional "conservative" approved safety analysis codes and methods and new "best estimate" computer codes and methods. The different principles outlined in the DG for the development of an Evaluation Model are appropriate for new "best estimate" codes and methods. However, the DG states that "...the same process applies even if the new evaluation model is the result of relatively simple modifications to an existing evaluation model." Applying this DG to "upgrades" to traditional approved safety analysis codes and methods has numerous implications such as questioning the industry understanding of event phenomena for even simple events, such as the non-

LOCA events. These implications ignore the fact that the existing traditional "conservative" approved safety analysis codes and methods have served the industry very well, as demonstrated by hundreds of years of safe reactor operation. In light of this experience, it does not seem reasonable to require that even simple upgrades to these existing traditional "conservative" approved safety analysis codes and methods be raised to a new higher level as spelled out in the DG. While it is understood that these "conservative" codes and methods are used to support plant upratings, changes in fuel design, etc., the basic conservative approach used is not being eroded or obviated.

A. Cost to Implement DG will not result in any Measurable Increase in Plant Safety for Existing Legacy Codes and Methods.

An important consideration regarding the implementation of the DG to upgrades to traditional "conservative" approved safety analysis codes and methods is that it ignores the potentially large costs that would be required to ensure that the DG principles are satisfied with little if any measurable increase in plant safety. Various comments which underscore these concerns are captured below.

1. The DG recognizes the new requirements will increase the cost to the applicant for methods development and documentation. However, the NRC appears to under-estimate the magnitude and significance of these additional requirements/costs on methods development. By significantly increasing the development and documentation costs associated with a license submittal, only organizations which can realize the benefits of the new methods over numerous reload licensing cycles will pursue methods development in the transient analysis area (nuclear fuel vendors). While this will help reduce the NRC workload, it will make the nuclear utility industry more reliant on the fuel vendor. Given the consolidation and reduction in the number of remaining fuel vendors in the U.S. market, continued uninterrupted operation of some nuclear power plants could be in jeopardy should one of these vendors choose to exit the domestic nuclear fuel market. For this reason, policies should be adopted which encourage applicants to assume responsibility for their own transient and accident licensing analysis, not discourage such practices.

2. Most applications are for changes to existing codes or evaluation models, and while it is stated that the same process applies, the practicalities of that implementation are not clear. While the rigor demanded in this DG is admirable, the practical effect it is likely to have is to stifle development work and advances. If it is necessary to re-lay the foundation for an existing analysis methodology so that an improvement in one discreet aspect of the analysis can be made, improvements will be prohibitively expensive and will cease to be made.

3. The regulatory analysis suggests that following the guidelines contained in the DG for a future non-LOCA evaluation model submittal would actually save effort and cost in the licensing phase. It is agreed that the NRC review effort and cost may be reduced, but the additional cost for an organization to follow the guidelines in DG for a future non-LOCA evaluation model submittal would far exceed potential savings on the NRC review fee. The cost of following the guidelines is excessive considering the significantly less complex phenomena associated with non-LOCA transients and accidents. The additional cost of following the guidelines will not add significant value or improve safety.

4. The DG is a guideline of how to develop and assess models used for quasi-realistic analyses. Although scattered sentences are provided to reduce the effects of these extensive requirements on the more traditional, conservative analyses assumed as the basis for Chapter 15 of the SRP, the scope, as defined in the Introduction should specifically exclude those types of analyses. The existing SRP provides adequate guidance for these types of analyses. The guidance allows for "brief" responses in the PIRT/code scaling, applicability, and uncertainty (CSAU) process for simpler events; however, even the process of addressing all sorts of unimportant considerations,

even "briefly," is time-consuming from both the origination and review standpoint, and adds no value.

B. Applying New Requirements to Established Codes and Methods is not Practical or Consistent with QA Practices

The application of the DG to traditional established "conservative" safety analyses codes and methods ignores standard Quality Assurance (QA) practices, which historically only required that changes to existing evaluation models be subject to the applicable standards present at the time when the codes and/or methods were approved. Requiring that existing traditional "conservative" codes apply the new principles presented in the DG is not practical or consistent with standard QA practices.

1. The applicability of the proposed RG to "changes to existing evaluation models" is excessive and should be deleted. As is standard Quality Assurance practice, changes to existing evaluation models should be subject to the standards in place when the original evaluation model was approved. Backfitting developmental practices is not practical on established codes and methodologies. Establishing higher standards for changes than those used for the approval of the original model discourages the adoption of better computational models that allow for the more efficient operation of the power plants.

2. For currently submitted and/or approved Topicals that did not utilize the DG, would it be the intent of the NRC to apply the DG on a forward-fit basis for any changes to the pre-DG approved methods? It is expected that the NRC would not alter the review criteria upon which previously submitted methods were reviewed and approved.

3. FSAR Chapter 15 non-LOCA transients and accidents are typically analyzed using evaluation models (using the new DG proposed definition of evaluation model) consisting of conservative or realistic computer codes and correlations, and requiring conservative assumptions for initial conditions, boundary conditions, and values of key input parameters. This standard method has been accepted by the NRC staff as ensuring an overall conservative analysis result. However, the DG is focused on "best-estimate" analyses and the determination of the uncertainty in transient and accident behavior. It is suggested that the title of the DG be revised to include the word "best-estimate". Further emphasis will provide the necessary distinction between the traditional conservative transient and accident analysis method, and the "best-estimate" analyses that are the subject of the DG. The traditional conservative transient and accident analysis method, which does not need to be revised along the lines suggested in the DG for "best-estimate" analyses, should remain fully acceptable to the NRC staff.

4. A graded approach needs to be defined. For a "best-estimate" LOCA, the full-blown PIRT/CSAU evaluation may be appropriate. However, for an analysis required to demonstrate that the DNBR event acceptance criterion is met for a PWR reactor coolant pump coastdown, a formal PIRT/CSAU evaluation is not reasonable. The capability to use decades of industry experience in lieu of formal PIRT/CSAU evaluations must be provided.

5. The implementation of the DG would hinder innovation by applying a cumbersome and costly process across the board independent of the original licensing basis, which is inconsistent with the NRC Quality Assurance practice.

C. DG Implies Insufficient Knowledge with Existing Safety Analyses

The recommendation that the DG be applied to even simple upgrades to existing traditional "conservative" safety analyses and codes implies that these codes and methods are producing non-conservative results and are thereby inappropriately justifying changes to the plants. However.

experience has demonstrated that the existing traditional "conservative" approved safety analysis codes and methods are more than adequate for ensuring the safe operation of the plants. While it is understood that these codes and methods don't model every aspect of the plant to the nth degree and sometimes make simplified assumptions, these effects are more than offset by the overall conservative approach used in the safety analysis methodology. This includes assumptions ranging from conservative initial conditions, to conservative reactor trip setpoints and ESF setpoints which account for instrumentation uncertainties to conservative design limits which typically contain significant margin to the actual limits.

1. The DG does not appear to provide a distinction between best-estimate LOCA methods and the methods (and computer codes) successfully used for Chapter 15 analysis over the past 30+ years. The only distinction made in the draft standard review plan Section 15.0.2 is on page 12 for uncertainty analysis. While the "best-estimate" LOCA analysis may be cutting edge technology, the methods for the rest of Chapter 15 are very conservative. The conservative approach used to review and approve these methods has stood the test of time. Therefore, the additional burden required by the DG and the draft standard review plan Section 15.0.2 for Chapter 15 analysis cannot be justified based on any perceived benefit to public safety.

2. By issuing the DG the NRC staff implies that there is insufficient knowledge of or inadequate modeling of the phenomena associated with FSAR transients and accidents. The DG does not provide any specifics or give examples that are the source of the staff's concerns. The industry has extensive experience analyzing these transients and accidents, and it is understood that the important phenomena are known and have been appropriately addressed in the analyses. If the NRC staff has additional information or concerns regarding specific phenomena for a specific FSAR transient or accident, then that additional information could be communicated to the industry through revisions to applicable Standard Review Plan Chapter 15 sections. NRC should communicate any concerns regarding the modeling of particular phenomena in an organization's evaluation model to that organization.

3. The guidance provided for the uncertainty analysis is to ensure that the uncertainties in the model prediction are less than the design margin. If this is the criterion to be used, then the applicant should also have the freedom to specify the design margin. As an example, assume the vendor demonstrates that during LOCA conditions, the fuel rods remain intact, coolable, etc. until the clad reaches a temperature of 3200°F. If the uncertainty analysis in the evaluation model application is 400°F, then a peak clad temperature design limit of 2700°F would meet the guidance provided for the uncertainty analysis. Conversely, if the staff imposes a somewhat arbitrary limit of 2200°F, then the applicant's evaluation model need only meet an uncertainty criterion of 1000°F. This approach will then be used in the selection of phenomenological models and or testing (the models do not have to be very accurate to meet a 1000°F uncertainty). Finally, as previously stated, the importance of a formal PIRT/CSAU is significantly diminished if the required uncertainty allowance is large.

D. <u>DG Needs to Provide Better Clarification for Requirements for Existing versus New Safety Analyses Codes and Methods.</u>

1. While the intent of the DG is laudable, the implementation is overly broad and ignores the precedence of analytical methods and tools approved by the regulator and in common use throughout the industry. There are two components that exist which comprise a rigorous evaluation model, i.e., to perform transient analysis, one must adhere to the appropriate method using appropriate tools. A useful regulatory guide on transient analysis would make clear distinctions between the development of methods and the development of tools. However, in the search for broad applicability of the evaluation model concept, under the guise of transient

analysis methods, the DG intermingles the developmental requirements of tools and methods, causing the thrust of the DG to lack focus, continuity, and clarity.

2. The source of this diffusion of the DG is captured in Paragraph 2 of Section B, *"This concept is described in 10 CFR 50.46 for LOCA analysis but can be generalized to all analyzed events described in Chapter 15."* and in Paragraph 7 of Section B, *"Sometimes, a general purpose systems code may be developed to address similar phenomenological aspects of several diverse classes of transients. This presents unique challenges in the definition, development, assessment, and review of those codes as they apply to a particular transient evaluation model."* Based on past experience not only "sometimes" but virtually always, a general purpose systems code is used to analyze transients. The use of general purpose systems codes is not the rarity, it is the standard practice throughout industry, not only with licensees, but also with vendors. The Issuance of the DG with the mindset that a separate set of computer codes is employed for each particular class of transient, which is the case for LOCA but not the case for non-LOCA, causes the regulatory guide to lose practical application for non-LOCA events, placing an undue and unwarranted burden on an applicant, and while it is regulatory, only in the most generous sense can it be viewed as a guide.

3. Perhaps a more workable solution is to limit the scope of applicability of the proposed guidelines to realistic applications. A separate appendix, similar to the proposed ECCS appendix, could be used to summarize those elements appropriate for a traditional, conservative analysis.

4. There are far more changes to existing evaluation models than new ones developed from scratch, and yet little guidance is provided in the DG or SRP regarding expectations for these changes. It is not clear what will be expected when applying the process for a change when the basic documentation falls short of these new standards. Not giving more attention to modifications causes the DG and SRP to fall short of their stated goal to clearly lay out the expectations in order to make the review process more efficient.

II. Implications for Future "Best Estimate" Realistic Safety Analyses

Clearly, as the industry transitions from the traditional "conservative" safety analyses approach to "best estimate" realistic accident analyses, which will provide a more reliable framework for risk-informed regulation and a basis for estimating the uncertainty in understanding transient and accident behavior, the DG provides good guidance. However, additional clarification needs to be provided before the DG can be effectively implemented.

A. Clearer Definition as to What Constitutes an "Evaluation Model" and When a Submittal is Required

There is a need for a more clear definition as to what constitutes an "Evaluation Model," as the definition could significantly affect the number of submittals to the NRC. If it includes "all" the inputs, as noted in the DG, this will significantly increase the number of submittals. Vendors and utilities alike perform evaluations on a daily basis as a result of changes to the plant. In addition, the DG should take into consideration how it will be implemented in light of the new 50.59 process.

1. If additional guidance is required for the future review of Chapter 15 analysis methods, that it be in a separate appendix to the DG. The new guidance should be developed jointly between the NRC and the many industry methodology and computer code developers. This joint effort would provide a workable document based on the vast experience of these entities.

2. The NRC should expedite the preparation of the appendices, as mentioned on page 1, which address phenomena and uncertainty analyses for particular class of events that are described in SRP Sections 15.1 through 15.6.

3. The scope of the DG should be expressly limited to those applications where "best-estimate" analysis results are important. The industry has developed a knowledge of what type of information is required to perform and obtain NRC approval of traditional, conservative analyses, such as those described in Chapter 15 of the SRP.

B. DG Guidance is Not commensurate with the Complexity of the Physical Phenomena Associated with the Non-LOCA Transients.

The majority of the non-LOCA events are relatively simple events, when compared to the LOCA events, and are typically based on phenomena that is well understood. For instance, the loss of flow events model a conservative flow coastdown that is confirmed to be conservative during the initial startup. Similar arguments can be presented for the majority of the other non-LOCA events.

1. The PIRT process is a good tool to document the rationale for the determination of the parameters of importance; however, as was determined during the NRC-sponsored PWR Rod Ejection PIRT, the process identified a number of holes where the experimental database was lacking. Now, there are a number of generally approved LOCA and Upper Plenum Injection LOCA specific mockups and ensuing experimental results that have been used for SECY and BE LOCA Licensing efforts; however, there may not be a large database for which to utilize for the Transient BE efforts. It is unclear at this time whether the DG has allowances for engineering judgement where there exists no experimental data. If not, there is a risk that the particular plants' BE methodology may be derailed by the lack of appropriate & scalable experimental data.

2. The DG defines the two analytical approaches to LOCA (bounding or BE + uncertainty) fairly well, but is vague about how to apply the same principals to transient analysis. The same standard should be applied to transient analysis.

3. The six basic principles are reasonable when applied judiciously. To some degree or another, these principles should be applied to all new applications; however, there must be some consideration for the complexity and conservative nature of the application.

4. A separate issue is the correct application of new computational devices to applications for which they were not originally intended. If these devices are intended for "best-estimate" applications, they will fall within the proposed scope of the DG. However, even if used for conservative applications, these computational devices may not have been developed for that intended application. The question becomes: "How to "backfit" a device to a new application outside the original scope?" Elements of the process described in the DG are useful for that determination; however, the DG process is significantly more exhaustive and formal than is necessary for these types of analyses.

C. Generic versus Plant Specific Submittals

1. The DG makes no guarantees about what is included in the scope of a generic review and what has to be addressed in a plant-specific review. The generic review would be a waste of time and money if all the subsequent plant-specific reviews had to address the same questions. The DG needs to define the scope of the generic review and the scope of any subsequent plant-specific reviews. Otherwise it's not helpful to utilities, the vendors, or to the NRC.

2. Is it the intent of the NRC to allow applicants to take credit for the fact that an approved code has been developed to model all important phenomena and then would allow the licensee to demonstrate applicability to their facility?

3. It is stated that "A complete scenario definition is plant-specific because the dominant phenomena and their interactions differ in varying degrees with the reactor design." Is this limiting our ability to have any generic methodology? Surely while results vary from plant to plant because of differences in the design, it is still a reasonable approach for most events to generically identify the dominant phenomena.

III. Implications for All Safety Analyses

The following comments apply to both existing safety analyses and for future "best estimate" safety analyses.

1. If the NRC was looking for uniformity in methods submittals, the DG does not appear to accomplish it. For example, the NRC needed to produce NUREG-0800 so RG 1.70 was interpreted correctly. It appears that DG is analogous to RG 1.70, and these aforementioned appendices are required so that the DG is interpreted correctly.

2. The interpretation of what constitutes a change to an evaluation model should be clearly defined. If a change is considered to include dimensional changes like a new steam generator design, then a lot of time would be spending proving that a code like RETRAN with no value added still applies to the changed plant. On the other hand, if a change is considered to be something like a new correlation in the code, then this would be acceptable.

3. It is not clear what threshold should be applied when deciding whether or not a code or code modification should be submitted to the NRC. This is significant as there is the potential for the number of submittals to greatly increase and it is not clear that this would result in a "better" code or methodology.

4. The NRC description of the Evaluation Model includes the procedures associated with the generation of input/output. This is different from what many believe construes the evaluation model. The NRC description implies that changes in input could affect the "Evaluation Model" and could kick-off a review. The level of review associated with this type of change, if we are forced to comply, has to be more limited otherwise costs will escalate to unreasonable levels.

DG-1096: Specific Comments

Page 0

The scope of DG is defined to be for the events "presented in Sections 15.1 through 15.6 of the SRP, except for the fuel assembly misloading event and all radiological consequence analyses." However, a few sentences later the purpose is defined "to provide guidance on realistic accident analyses, which will provide a more reliable framework for risk-informed regulation and a basis for estimating the uncertainty in understanding transient and accident behavior." While the content of the DG appears to be geared toward "Chapter 15" analyses, the meaning of the reference to "risk-informed regulation" is not clear.

Page 1

"This regulatory guide is intended to provide guidance for realistic accident analyses, which will provide a more reliable framework for risk-informed regulation and a basis for estimating the uncertainty in understanding transient and accident behavior."

Some definition should be assigned to the term "realistic". Possibly, the type of analyses should be specifically addressed (i.e., SRP Chapter 15 events, HELB, Off-site Dose, etc.).

Page 4

Item #4 discusses the ability to predict appropriate experimental behavior.

This is usually addressed during the generic submittal of a particular code (e.g., RETRAN-3D, WCOBRA/TRAC, etc.). However, per the NRC's definition of an Evaluation Model, this may not be handled generically, because the EM definition includes (1) procedures for data manipulation, (2) plant geometry, and (3) "all other information necessary to specify the calculation procedure".

Item #5 states that an appropriate QA program will be followed. The NRC also stresses the use of a peer review by independent experts.

This is a good practice, and is similar to the current Design Review process that is used at various utilities within the industry.

Page 7

Element 1 focuses too much on the plant-specific and transient-specific scenario specification. To the extent that the scenario definition is important to a PIRT, it is typically applicable to a broad class of plants and to a larger class of transients.

Page 9

Section 1.1.3 needs to be tempered by the complexity and importance of the analysis. A best-estimate analysis with little design margin would obviously be examined more closely than a conservative analysis with significant margin regulated into the design margin.

Page 10

The structured PIRT is overkill for the traditionally conservative FSAR calculations. It is well known that a few phenomena are important for specific events, and the transient results are insensitive to all other

phenomena. Requiring that "all other phenomena" be identified adds no value to the quality of the product.

The content of the PIRT for "an optimum analysis" is described. For changes to existing codes/methodologies for which a PIRT was not developed, is it expected that a PIRT will be developed for aspects of the evaluation model not being altered?

Page 12

The NRC lists five items that should be included in the assessment data base.

All of these items are appropriate. An important observation is the NRC's statement that benchmarks to other codes and simple fundamental test problems do not supplant the requirement to obtain appropriate experimental and plant transient for EM evaluation. Clearly, the NRC is weighing heavily on the scalability benchmarks to the SETs and IETs with confirmatory benchmarks to available plant transient data.

Page 13

The back-fit of scaling information to "Legacy Code" modifications is not appropriate. This would place an undue burden on the vendors to generate this information. On a "new" or best-estimate application, this makes sense.

Page 16

Several elements (e.g., element 4) are valid approaches for "designing quality into" a product; however, it is not recognized that many computational devices are essentially commercially dedicated. Allowances should be provided for the use of alternate processes for the commercial dedication of existing computational devices.

Page 19

NRC states in Step 20 of the EMDAP – after talking about BE LOCA – that "For other Chapter 15 events, a complete uncertainty analysis is not required. However, in most cases the SRP guidance is to use 'suitably conservative' input parameters."

If the SRP guidance stipulates the utilization of "suitably conservative" input parameters which defines current SRP compliant RSE methods, then why would anyone undertake this process. Consistent with the two methodology paths for Large Break LOCA (SECY/App. K versus Best-Estimate), a distinction for the non-LOCA transients could be stipulated as well. The concern is whether the NRC will "require" the use of this process to justify the suitability of the conservative inputs which define our current "bounding type" analyses or require it for a new submittal which still utilizes the "bounding type" approach? It would be preferred if the NRC would exempt the current "bounding type" analyzes from the requirements of this DG (similar to the following words for LOCA analyses):

The NRC states in Appendix A (LOCA); "An uncertainty methodology is not required for the original conservative option in 10 CFR 50.46. Rather, the required features of Appendix K provide sufficient conservatism without the need for an uncertainty analysis.

For many plants, LBLOCA sets the value for peaking factors which is one limitation in the core design process; however, at this time, the Transient Analysis does not limit the core design process. Therefore, a significant improvement in the Transients Analysis methodology may not be financially justified – if the

methodology/licensing process is non-trivial, and the monetary payback is not anticipated – hence, it would be difficult to justify the expense.

Page 19

Section 1.4.8, Step 20. "...For other Chapter 15 events, a ~~complete~~ uncertainty analysis is not required. ..."

Further, model biases are frequently "built-in" to the computational device, either through the selection of input parameters or code options. If in the "conservative" direction for the intended application, these biases should not required quantification.

Page 19

It is noted for Chapter 15 events other than LOCA that a "complete uncertainty analysis is not required." However, the text continues in describing a "limited assessment of biases and uncertainties." It is not clear what this would entail.

Page 21

Methodology Document. The process diagram showing program interactions is a good thing to do.

Page 22

This methodology description is needed to know exactly how the transient will be analyzed in its entirety." Therefore, procedural manuals would potentially need to be submitted to the NRC.

Page 22

A key ingredient of the documentation is a models and correlations quality evaluation (MC/QE) report. The MC/QE report provides a basis for the traceability of the models and detailed information on the closure relations. Information on correlation and model sources, data bases, accuracy, scale-up capability, and applicability to specific plant and transient conditions should be documented in the MD/QE report.

Page 23

Documentation Section 3.4: The Users Manual and Users Guidelines may be separate documents. The code developer may provide the Users Manual (including some Guidelines), and the individual application may provide their own Guidelines, which may or may not be consistent with the guidance provided by the code developer. Allowances should be provided to allow the application to supply the requested information in a well-organized manner. Restricting that information to Users Manuals is too restrictive.

Page 25, Section 4. "General Purpose Computer Programs"

Essentially, the NRC is saying that a generic submittal cannot perform the EMDAP because the generic assessment does not include all the appropriate geometry, phenomena, or the necessary range of variables to demonstrate code adequacy for some of the proposed plant-specific event analyses. However, on a good note, the NRC clearly states the use of "transient class" and "power plant class" in the EMDAP (e.g., loss of flow transients for 2-loop plants) which would at least reduce the number of cases required.

While the DG discusses the possibly inapplicability of generic submittals and reviews, SRP15-0-2 provides the reviewer a option to possibly utilize a generic submittal or another plant specific submittal for consideration of applicability to anther plant specific submittal (draft SRP). In the end, maybe this process

just changes how a generic submittal is performed and documented. The generic submittal could be used to comply with a majority of the DG, and the applicant would "fill-in" the power plant and transient specifics. In other words, the plant geometry (possible change to the nodalization) would be input, and the SET & IET databases (small subset possibly) would be validated, then the transient classes would be validated by benchmarking to appropriate and available plant transient data.

Page 25

The last sentence in Section 4 of the DG states, "To avoid such problems, it is important to qualify the applicability of the generic code, including its models and correlations, and the applicability of any "generic" assessment that accompanies the code."

The last sentence clearly states the applicant is expected to re-justify the methodology (models, correlations, field equations, closure relations, processes, scalability, and applicability) of transient analysis computer programs such as RETRAN-3D which have been submitted to the NRC for generic code review. This conflicts with the NRC desire to have the industry submit codes for generic reviews and provides no benefit for future generic code submittals, thereby, potentially increasing the NRC workload. Furthermore, it eliminates the benefit to the industry in supporting joint methods development projects since the costs associated with preparing the generic submittal will be on top of similar costs associated with preparing the DG required qualification of the code models and correlations in the applicants plant specific submittal.

Page 25, "Implementation"

The implementation statement is quite non-specific; The NRC state; "...the methods to be described in the effective guide reflecting public comments will be used in the evaluation of submittals in connection with evaluation models used to analyze transients and accidents." Once again, a distinction between bounding and realistic analyses (similar to LBLOCA) should be included here to ensure the appropriate application of this DG. If an applicant decides to perform a code change while still employing the bounding input parameters approach...will the NRC require the applicant (via RAIs) into this process even though the applicant is not using a BE method?

Page 30

Top-down definition
NRC states, "The approach items 1 through 5 are independent of analysis tools"; however, item (5) is the applicability and scalability of the analysis tools. Possibly it should read that 1 through 4 are independent of analysis tools...(#5 should not be included as independent).

Page 35

An uncertainty methodology is not required for the original conservative option in 10 CFR 50.46. Rather, the required features of Appendix K provide sufficient conservatism without the need for an uncertainty analysis. It should be noted that Section II.4 of Appendix K requires that "To the extent practicable predictions of the evaluation model, or portions thereof, shall be compared with applicable experimental information." This is a key for Appendix-K SBLOCA.

WOG Comments on Draft Regulatory Guide DG-1096 and
Draft Standard Review Plan Section 15.0.2

SRP 15.0.2 Comments:

1) This document does not use terms such as evaluation models and code models consistently with DG-1096.

2) The guidance to the NRC reviewers needs to recognize that most codes in use today were not started from a blank sheet of paper, but rather built upon previous codes or code versions, many of which are approved by the NRC for use in many applications. Allowances for an applicant to use the decades of experience must be provided.

3) Formal and complete PIRTs and Uncertainty analyses should not be required for methods used for the traditional, conservative analyses or for changes to existing methods used for conservative analyses.

4) Section II.1. Documentation: The requirement to sort the responses to requests for additional information by review issue is cumbersome. If the staff wants this done, they should issue the requests for additional information by review issue.

5) Section II.1.F. The Users Manual, per se, will not usually provide descriptions of how to choose model input parameters and code options. These descriptions are typically found in a topical report that applies a computational device. It is more appropriate to simply require that the information be provided in "The Package" and must be clearly organized in a reasonable manner.

6) Section II.3. Add a qualifying statement: The formality and complexity of this process should be commensurate with the complexity and importance of the accident(s) under consideration.

7) Section II.4. These statements are a bit rash. Assessments should only be required of code models intended to be used for a given application. Further, the statement that assessments performed with other versions of the evaluation model are not acceptable is clearly excessive. A more appropriate requirement is to ensure that if different versions are used for the assessment, an evaluation of the potential effects on the assessment should be provided. It is not unusual for a model affecting the kinetics (e.g.) to be changed. This change will clearly have no effect on the assessment of a stand-alone blowdown model where a reactor core is not modeled. In addition, compliance with QA programs will ensure that any effects one change has on the remainder of the computational device are identified and evaluated.

   As before, a graded approach must be added to reduce the requirements for scaling analyses for conservative analyses.

8) Section II.5. The second paragraph should be acceptable for all cases; remove the "in some cases" qualifier.

9) Section II.5. If the requirement to ensure the uncertainty associated with a code is less than the design margin is retained, then the applicant must have the capability of selecting how much design margin is to be built-in to the figure of merit. If regulated design limits are to be used, the NRC staff must first specify the design margin (not just the regulatory limit). The design margin will obviously affect the accuracy goals of the computational device.

10) Section II.6. Provision must be made for "commercially dedicating" an existing code that was not developed under a QA program.

11) Section III. There are several discussions in this section that are either "tutorials" to reviewers or have a flavor of "code developers will try to sneak one by, so be on the watch." Such tutorials and "warnings" have no place in this document.

12) Section III.3.c. As mentioned in many other places, the formality, structure, and detail of the PIRT should be commensurate with the complexity, importance, intended application, experience base, etc. of the transient and accident analysis. In some circumstances, the results of a formal PIRT may be "intuitively obvious;" in such cases, there is no value added through the performance of a formal PIRT.

13) Section III.3.d. Formal scaling calculations and the assessment of calculations "over the full range of conditions encountered in the accident scenario" are both excessive requirements. The need for such evaluations should be commensurate with the complexity, importance, intended application, experience base, etc. of the computational device.

14) Section III.3.e. If the requirement to ensure the uncertainty associated with a code is less than the design margin is retained, then the applicant must have the capability of selecting how much design margin is to be built-in to the figure of merit. If regulated design limits are to be used, the NRC staff must first specify the design margin (not just the regulatory limit).

15) Section III.3.f. Provision must be made for "commercially dedicating" an existing code that was not developed under a QA program.

16) Page 3: "The evaluation model documentation must be scrutable, complete, unambiguous, accurate, and self contained." The documentation being requested is extensive and will be volumous.

17) Page 7: "The reviewers should also confirm that required input settings are hardwired into the input processor so that the code stops with an error message if the required input is not provided or if the input is not within an acceptable range of values." This is too prescriptive. One could have a great process in place for accurately performing an analysis that does not include the automatic error messages from the code regarding input. Even worse, this is requiring that the code should stop for all pre-conceived input inadequacies?

18) Page 7 *Documentation* – The requirement that the code stops when using input settings out of ranges is too prescriptive and limits the potential application of the code. This would also be very costly to implement. The implementation of warning messages would be a best-practice application but could require significant re-coding

19) Page 11: "The reviewers should refer to published literature for sources of assessment data for specific phenomena, accident scenarios, and plant types. These include the ECCS Compendium, NEA validation documents, and International Standard problems." Would one find information pertinent to non-LOCA events in these references, or has attention been so heavily weighted toward LOCA analyses? There are general concerns with being able to apply all the requirements identified in the DG and SRP to non-LOCA transients, when the requirements appear to have been developed primarily with LOCA in mind.

20) Page 11. Uncertainty Analysis – The use of audit calculations as a tool for confirmation of uncertainties has uncertainty associated with it as well. What makes any other code more/less certain? What kind of uncertainty does the particular code have in the range being applied to? etc.

21) Page 12: "The peer review team should include programmers, developers, end users, and independent members with recognized expertise in relevant engineering and science disciplines, code numerics, and computer programming." This sounds like a boon to independent contractors who can market themselves as having "recognized expertise."