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NRC Project 692

Rules and Directives Branch
Office of Administration
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Subject: Comments on Draft Regulatory Guide DG-1096, *Transient and Accident Analysis Methods,* and Draft Standard Review Plan Section 15.0.2, *Review of Analytical Computer Codes,* (65 *Fed. Reg.* 77934, 12/13/2000)
Response to Request for Comments

The purpose of this letter is to provide CEOG comments on the draft Regulatory Guide and draft Standard Review Plan. These comments are provided in response to the subject request.

Draft Regulatory Guide 1096 discusses development of analytical computer codes that are used for safety analyses. An associated draft Standard Review Plan, proposed Section 15.0.2, discusses the review of analytical computer codes used for safety analyses. CEOG comments on these two draft publications are attached.

Please do not hesitate to contact me at 623-393-5882 or Gordon Bischoff, CEOG Project Office, at 860-285-5494 if you have any questions.

Sincerely,

Richard A. Bernier

Richard A. Bernier, Chairman
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Comments on Draft Regulatory Guide DG-1096, *Transient and Accident Analysis Methods*, and Draft SRP Section 15.0.2, *Review of Analytical Computer Codes*

Based upon CEOG review of draft Regulatory Guide DG-1096 and draft Standard Review Plan Section 15.0.2, concerns have been identified with the purpose, scope and application of the proposed guidance documents. These concerns are identified in this attachment along with general recommendations on how these concerns can be addressed.

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The NRC staff has developed draft guidance to support the development and assessment of evaluation models that may be used to analyze transient and accident behavior (i.e., "Chapter 15" analyses).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. The CE Owners Group (CEOG) through its Analysis Subcommittee, has developed comments on the contents and potential impact of the draft Regulatory Guide and SRP section. Westinghouse has collected and organized the comments on behalf of the CEOG.

Summary

Overall, the CEOG believes that DG-1096 and draft SRP 15.0.2 should be significantly rewritten to limit the scope of application to the development of new best-estimate methodologies for realistic accident analysis. In particular, the methodology should be used as a guide to the analysis of risk-significant accident scenarios. It is not appropriate to use this detailed prescriptive process to review models where the applications are highly conservative and the code input data (such as initial conditions, time in life, etc.) have been deliberately biased to produce conservative or worst case results. In addition, the new Regulatory Guide should not be applicable to changes or updates of current analytical models.

In general, Chapter 15 non-LOCA safety analysis is performed in a highly conservative manner such that the data, assumptions and choice of accident sequence will mask any shortcomings or simplifications in the evaluation models. The overall level of conservatism has been established in many ways including multiple layers of regulatory review. For this type of safety analysis, it is not appropriate or necessary to perform the type of in-depth assessment described in the draft Regulatory Guide. The Guide needs to distinguish between the Chapter 15 transient analysis methodology and best-estimate accident analysis models.

Since the draft Regulatory Guide is directed to best estimate accident analyses, the CEOG questions whether it is appropriate to classify the associated Standard Review Plan as Section 15.0.2 of NUREG-0800. Section 15 of NUREG-0800 provides guidance for the Chapter 15 safety analysis that is required to be included in a plant's FSAR. The type of best-estimate evaluation models described in the DG is not approved for application to Chapter 15 analysis and, therefore, the review of Chapter 15 evaluation models should not be based on the DG.

As currently written, CEOG concludes that the draft Regulatory Guide would increase costs and stifle development of new methodology.

Overall Comments on DG-1096

DG-1096 imposes a complex, highly prescriptive process on methodology development for transient & accident analysis, with no guidance on scope or level of detail. Level of detail is to be determined by "risk importance," where risk importance is left undefined by the guide. Incremental changes to existing models are said to require less detail, but again there is no definition of what constitutes less detail or which parts of the process can be short-circuited.

The introduction to DG-1096 suggests that the scope of the RG is the development and assessment of evaluation models that may be used to analyze transient and accident behavior. In particular, these events are identified as those presented in Sections 15.1 through 15.6 of the SRP.

The document appears to focus more on new methodology and little on modifications to existing methodology. We recommend that this be written to be clearer on what is required for certain types of methodology changes such as cycle-by-cycle parameter changes, conservative changes (similar to what the new 50.59 rule would allow without NRC review), code version changes that do not affect a particular analysis, etc.

It would be helpful if the NRC would list what they consider to be the "appropriate" experimental data for certain event types to eliminate uncertainty as to just what applies to what and to simplify acquisition of the data for comparison.

The document should state what limitations there are for the use of spreadsheet and other "generic" engineering tools, such as *MathCAD* or similar software.

It would be useful to note in the introduction that page 27 contains "definitions that will be used throughout this DG."

The effort to develop this DG should be coordinated with the efforts for risk-informing Chapter 14 and 15 events, and also address our typical conservative analyses.

Page 10 states that expert opinion will be used to support the PIRT process. What constitutes an expert? The NRC's definition may differ from that of a fuel vendor or utility. See comment on page 34, below, as an example.

Specific Comments on DG-1096

Page 1, paragraph 2: The DG states that the technical specifications for the facility are to be based on the safety analysis. However, many technical specification requirements have no transient or accident analysis basis. Add statement that recognizes that some technical specification requirements may have no basis in the safety analysis but were included based on good engineering judgement and industry experience.

Page 1, paragraph 3: Add another sentence after the first that states that the specific evaluation models currently approved by the NRC for each site remain acceptable to the NRC and need not be revised based on the guidance in this Regulatory Guide.

Page 1, paragraph 3: The DG indicates that this document is to be used with SRP Section 15. CEOG plants are not all SRP plants. How will DG-1096 be applied and will SRP Section 15 be invoked to include events not in the design basis of non-SRP plants?

Page 1, paragraph 4: Add another sentence after the first that states that the guidance contained in this Regulatory Guide does not apply to known conservative methods that have been previously reviewed and approved by the NRC staff. Examples are Appendix K based

ECCS evaluation models, where industry experience demonstrates that these models contain sufficient conservatism to account for any uncertainty in the transient or accident behavior.

Page 1, paragraph 4: There is no detailed discussion on the scope and definition of "realistic accident analysis". Will there be? The paragraph should be reworded to say that the DG primarily applies to best-estimate analysis and not to conservative analysis that is typically performed for Chapter 14 and 15 events.

Page 2, paragraph 1: The DG indicates that EM reviews will need to be initiated whenever an approved model for a specified plant does not exist. Does the approval have to be plant-specific, or will approval be given in a generic manner. For example, if a licensee changes fuel vendor and wishes to implement a new (approved) model for transient analysis, does this require EM reviews? It does not appear to, but the wording should be more precise.

Page 4, item 2: If this is benchmark data, why not call it that rather than introduce new and confusing terminology. This paragraph also indicates that new experiments may be "required." A RG cannot *require* the use of these methods. Suggest changing the wording to "desired."

Page 4 Item 4: CEOG questions the statement "...the calculational devices are collections of models and correlations that are empirical in nature."

Page 4, item 4: Add a new sentence that states that the adequacy assessment must consider the uncertainty in the analysis methods and inputs, including design tolerances and instrumentation error.

Page 5 Item 5: A NRC definition of "independent expert" is needed. How "independent" should the independent expert be?

Page 6: Fix wording layout. For IET and SET, see the comment on page 4, item 2, above.

Page 7, item 1, line 4: Change "models" to "model."

Page 8, paragraph 1: Delete extra spaces.

Page 10, paragraph 6: We do not like to "rely heavily on expert opinion, which can be subjective." This creates a potential for much iteration. We encourage the NRC to develop a less subjective process for development of new evaluation models.

Page 13 paragraph 1: It is unlikely that there will be much plant transient data for some of the more severe accidents; comparison to other codes is preferable.

Page 15, paragraph to right of Figure 4: Fix format.

Page 23, section 3.6, item 3: Correct "ssessment" to "assessment."

Page 30, definition of uncertainty: Add "(3) the inaccuracy associated with the allowed design and performance tolerance of the systems, structures, and components."

Page 31, References 3 & 4: Fix text alignment.

Page 34, paragraph 1: It is stated that "uncertainties in the analysis method and inputs must be identified and assessed so that the uncertainty in the calculated results can be estimated." How is this done and who is qualified to do this? Is this required for other "conservative options?"

Page 35, paragraph 1: This paragraph talks about cross-product runs and seems to be indicating that a large amount of work needs to be done for each individual parameter. Although this may be necessary for some parameters, it is not necessary for all parameters.

Page 35, paragraph 2, line 5: "Sensitive" should be "sensitivity."

Page 35, paragraph 2: This paragraph talks about uncertainty methodology. It would be helpful to reference a methodology that the NRC considers acceptable.

Page 35, paragraph 3: There is no definition of the "required features" of Appendix K. This should be better delineated.

Page 37, paragraph 1: It is essentially stated that the applicability of the DG is "if the analytical models have not been previously reviewed and found acceptable by the staff." CEOG interprets this to mean that continued use of currently-approved evaluation models is acceptable to the NRC and will not be subject to further review under the Draft Regulatory Guide.

Page 38, paragraph 1: The statement that this DG will provide time savings is false. Since the NRC may chose various interpretations of this DG and utilities will do the same; CEOG expects continued iterations, only on a larger scale.

Page 39, section 4.0: CEOG does not agree that this DG will require a "relatively small cost of initial work and documentation." This is a major, convoluted and confusing document that will lead to increased effort to obtain approval of new or modified evaluation models.

Specific Comments on SRP 15.0.2

Page 1: The SRP should be titled, "Review of best-estimate evaluation models."

Page 1, paragraph 1: Add clarification that ECCS evaluation models containing the features specified in Appendix K need only document conformance with the required and acceptable features of Appendix K ECCS evaluation models. The additional requirements specified for realistic models do not apply. Appendix K ECCS evaluation models do not require any assessment or documentation of uncertainties in the analysis methods or inputs. Industry experience demonstrates that these models contain sufficient conservatism to account for any uncertainty in the transient or accident behavior.

Page 2, item 2: CEOG notes that the EM consists in part of "values of parameters." Since many of the values input to the analysis of a given transient /accident are cycle-specific, this could be interpreted to mean that a different EM is generated every cycle and that qualification of a new EM would be necessary every cycle for every event analyzed. We suggest qualifying this statement to indicate that the "values of parameters" are limited to those that are cycle-independent and will not change over the life of the plant.

Page 3, item 1: The documentation section conflicts with the documentation requirements stated in 10CFR50.46(a)(1)(ii) for Appendix K ECCS models and would appear to require documentation and reviews that, previously, only applied to realistic models. Specifically, 10CFR50.46(a)(1)(i) requires an uncertainty analysis for realistic models, but 10CFR50.46(a)(1)(ii) provides an alternative ECCS evaluation model conforming with Appendix K requirements that would previously not require an uncertainty analysis.

Page 3, item 1: We suggest that the term "technical library" be defined and that the Public Document Room be included.

Page 3, item 1.D: Does this mean that a code uncertainty evaluation has to be performed for each EM (i.e. each transient analysis model)?

Page 4, number 4: The statement "...assessments performed with other versions of the evaluation model are not acceptable because even "small" changes to the evaluation model can have unintended consequences..." will hinder code development.

Page 5, paragraph 4: The statement "...data available from plant instrumentation is generally not detailed enough to support code assessment..." is in conflict with DG-1096 page 12 item 1.2.1 Step 5, which says that the data base for assessment of the EM should include "4. Plant transient data (if available)."

Page 8, paragraph 4: Remove hyphen from "equa-tions'

Page 10, paragraphs 1 & 2: What constitutes "expert opinion?" See comments under Draft Regulatory Guide DG-1096.

Page 11, section e: No guidance is provided on acceptable methods to use for uncertainty analysis. Is this evaluated on a case by case basis?

Page 12, paragraph 4: Correct "plan model" to "plant model."