0509
M. Cunningham
D. Fischer

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Detroit Edison
Fermi 2
6400 North Dixie Highway
Newport, Michigan 48166
(313) 586-4000

Nuclear Operations

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David L. Meyer, Chief, Rules and Directives Branch
Office of Administration
Mail Stop T-6D59
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

References: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

2) Detroit Edison Letter to NRC, "Detroit Edison Comments on Draft Guidance for Use of PRA in Risk-Informed Applications," NRC-97-0078

3) Draft Regulatory Guide DG-1061 dated June 1997 "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Current Licensing Basis"

4) Draft Regulatory Guide DG-1062 dated June 1997 "An Approach for Plant Specific, Risk-Informed, Decision making: Inservice Testing"

5) Draft Regulatory Guide DG-1064 dated June 1997 "An Approach for Plant-Specific, Risk-Informed Decision making: Graded Quality Insurance"

6) Draft Regulatory Guide DG-1065 dated June 1997 "An Approach for Plant-Specific, Risk-Informed Decision making: Technical Specifications"

7) Draft Standard Review Plan SRP Chapter 19 Revision L, dated March 27, 1997, "Use of Probabilistic Risk Assessment in Plant-Specific, Risk-Informed Decision making: General Guidance"

8) Draft Standard Review Plan SRP Chapter 3.9.7 Revision 2C dated March 13, 1997, "The Review of Risk-Informed Inservice Testing Applications"

9) Draft Standard Review Plan SRP Chapter 16.1 Revision 13 dated March 13, 1997, "Risk-Informed Decision making: Technical Specifications"

10) Draft NUREG-1602 dated June 1997, "The Use of PRA in Risk-Informed Applications"

Subject: Second Tier of Detroit Edison Comments on Draft Guidance for Use of PRA in Risk - Informed Applications

Detroit Edison is pleased to have an opportunity to provide this second tier of comments on the Nuclear Regulatory Commission's (NRC) draft guidance on acceptable methods for using probabilistic risk assessment (PRA) information in support of plant specific changes to the current licensing basis (CLB). This guidance is given in the eight documents cited in references 3-10. There is a considerable amount of complex material contained in these documents, and the NRC is to be complemented on the extensive effort that has gone into this guidance development. Their length and complexity has mandated a two tier approach to be used for our comments. The first tier was submitted August 6, 1997, just prior to the associated NRC Workshop held August 11 - 13, 1997. See reference 2. This second tier of comments will in general go into a little more detail, is broader in scope, and takes advantage of information gained at the workshop. While the original comments still stand as Edison's initial response to the subject NRC draft guidance, this second tier of comments is structured, for convenience, to include and thus replace those transmitted in reference 2.

To provide a context with which to view Detroit Edison comments, a brief description of PRA activity at Fermi 2 will be given. Since submittal of the final IPE Report in September 1993, the Fermi 2 PRA staff has continued to update the PRA model and to expand the use of risk considerations in decision making. Update activities have included use of improved computer software, incorporation of plant modifications, and improvements in the PRA model. Areas of PRA activity include support of the Maintenance Rule program for both risk significance and performance criteria determination; support of the GL 89-10 Program by providing, with contract support, MOV importance measures as input to test frequency determination; continued development of risk monitoring capability for on-line plant configurations; provision of risk importance measures for general use in prioritization of self-assessment and training activities; and miscellaneous support for issue resolution where amenable to risk input. Utilization of risk information for the specific activities covered by the subject draft guidance has been deferred pending further evaluation of its benefit and development of

the associated NRC guidance and requirements. A recent exception is the submittal for a Technical Specification change involving AOT extension for emergency diesel generators a little less than two years ago. A decision is still pending. Finally, Fermi 2 requested an assist visit from INPO to obtain additional views on PRA application, and we have participated in the current BWROG Peer Certification project to help assess the adequacy of our PRA model in relation to its use and to obtain recommendations for its improvement.

Following our initial review of the subject guidance, we feel it will be difficult to expand PRA usage in the regulatory arena if the guidance is maintained in its current form. This judgement is simply based on what appears to be an inordinate amount of resources required to accomplish a given application. Part of this perception could be due to a misinterpretation of an intended flexibility that is not explicitly spelled out; if so, additional clarification needs to be added in several areas.

Example bases for some of our concerns are included in a listing of the specific review comments given below. The cited page numbers refer to the unbounded versions of the guidance documents. Pagination for the bound versions of the guidance documents is slightly different.

- While there is some language that states that the evaluation level and robustness of the PRA should be commensurate with the application (pp. 2-5 and 2-7 of DG-1061 and p. 4-6 of DG-1065), much of the guidance implies significant changes are being made with no hint as to what is required for more modest requests. More specifically, there appears to be a risk increase threshold (CDF of 1E-6/yr) above which "increased NRC technical and management review" would be required (p. 2-8 of DG-1061). Much of the guidance appears to deal with the nature of this increased review and corresponding requirements. However, it is not clear as to what is required for submittals falling under this CDF limit. Moreover, setting of a precise numerical value above which the submittal and review requirements increase substantially does not appear prudent. For example, a CDF risk increase of 1.1E-6/yr for a proposed change that is well understood and consistent with other plants should not require the quantum jump in evaluation requirements implied by the draft guidance. There needs to be more provision for technical judgement to be exercised on this issue such as alluded to by citing use of simple bounding techniques or qualitative analyses for uncertainty determination on p. 2-11 of DG-1061.

- It may well be that an applicant would have to construct seismic, fire and shutdown PRAs to avoid extensive uncertainty analysis for any application even though the risk increment computed by the internal events PRA is small and conforms to the above mentioned risk increase threshold. (p. 18 of SRP 19.)

- Other statements imply the need for extensive staff review of the base PRA model (pp. 31, A-1, A-7 of SRP 19 and p. 3-2 of DG-1061), requiring a corresponding amount of time and resources; further, it's not clear if this is a one time review or is repeated for each submittal if the model has been updated since the previous review. It would seem adequate to only submit changes to the base model that are relevant to the proposed change and/or for a portion of an unchanged model that is of special significance (if any) for the given application if that portion had not been previously submitted.

- There is a very open-ended statement (p. 4 of SRP 19) that implies the potential for increased regulatory requirements to "preserve the assumptions in the supporting risk analysis" for each application. What is an example of an "enhanced regulatory requirement" in this context? There are obviously many assumptions in any risk analysis, particularly if the supporting PRA model is included. At the workshop in response to a question as to the intent of this statement, it was implied that it was intended only to enforce major assumptions upon which the submittal was made that have no current bases for regulatory control. That sense is not conveyed by the sentence as it now stands except for the caveat, "Where appropriate".

- The subject risk-informed regulation guidance appears to be the vehicle for introducing extensive monitoring programs in support of performance based regulation. While there is obvious merit in performance based regulation, an across the board required monitoring program for every risk informed change in the CLB is not necessarily prudent. In a number of cases, to confirm the risk levels associated with a given change, the plant performance data just isn't there unless an extensive and lengthy research type project is initiated likely including other like power plants in order to achieve the required statistical base (pp. 25 and A-8 of SRP 19).

- The requirement for a Configuration Risk Management Control Program in the case of Technical Specification changes as discussed at the Workshop, appears essentially redundant to what is being controlled by Section (a)(3) of 10CFR50.65 (Maintenance Rule). While the plan to change "should" to "shall" in Section (a)(3) has not yet been implemented, it would appear to be inevitable. Moreover, even with the configuration control portion of Section (a)(3) not being a current legal requirement, NRC inspection practices essentially treat it as if it were. Resident inspectors verify that safety assessments have been performed before equipment is removed from service, and if that assessment appears suspect, the issue is further reviewed by higher levels of NRC management, potentially leading to further focused inspections. See SECY-97-172. Additional program requirements that appear independent of the Maintenance Rule is largely redundant, requiring additional resources with questionable improvement in safety.

- At the Workshop, an NRC representative suggested the potential for comparing analyzed risk during operation with that at shutdown as a means for deciding in which mode to take specific equipment out of service. This idea is also mentioned on page 4-7 of DG-1065. While in a theoretical sense this seems a logical approach, in a practical sense it is very premature for most plants. First of all, shutdown risk models would obviously be required. Moreover, such models would have to be of comparable scope and detail as the operating mode model if the numerical comparison of risk is to be used as a basis for decisions. (e.g. the PSSA portion of ORAM would not be appropriate) Such detailed models are extremely resource intensive so that it becomes very questionable if the effort would be worth the benefit. Recall the intensive effort of Sandia National Laboratories in developing a shutdown PRA for Grand Gulf. Recognizing that plants spend about 10% of the time in the shutdown mode, and shutdown safety is generally controlled by well prescribed defense in depth techniques often reinforced by applicable software to help track system dependencies, it would seem that shutdown safety can be adequately handled independently of the operating mode. Changes in equipment availability during operation can in turn be evaluated and thus controlled through a blend of deterministic and risk-informed measures to maintain risk at an appropriate level for that mode. Perhaps in the future as PRA techniques mature, the optimization implied by the suggested numerical risk comparison between operating and shutdown plant states will become a practical reality.

- For changes to Technical Specification AOTs the definition for change in incremental core damage probability (ICCDP) includes the proposed <u>total</u> AOT as the time duration for the stated risk increase without further explanation. Logic, and the general guidance of DG-1061 would dictate that instead, the risk increase at issue would be the expected <u>change</u> in out of service time due to the new conditions leading to the requested extension relative to the expected or experienced out of service time for the original AOT. The relationship of this expected change to the total proposed AOT would depend on the specific circumstances. If the proposed AOT is felt to be generally a reasonable representative measure of the increase in equipment outage time, then that rationale should be so stated in the guidance. However, if a given application can support a different time duration for the quantification of ICCDP, it should be allowed. (See footnote on p. 4-5 of DG-1065.)

- The definition of "very small" in the case of risk increase expressed as ICCDP is 5E-07, which appears to be a suggested criterion for AOT modifications. (p. 4-17 of DG-1065) It is not clear why this value could not have been made equal to the criterion of 1E-06 given in the EPRI "PSA Applications Guide" for a non-risk significant temporary risk increase. Consistency with the equipment repair time in the development of the ICCDP value as described at the Workshop could likely be maintained by using 10 hours (rather than five) with a higher completion fraction. Also, is there a purposeful distinction being made between the term "<u>very small</u>

quantitative impact on plant risk" as required by DG-1065 on page 4-17 and "small proposed increases in risk" as stipulated in the Key Principles and elsewhere in the general guidance document DG-1061? If so, the rationale should be given; if not, the term "very small" should be deleted.

- The concept of using a simplified Level 2 model for evaluating "large early release frequency" (LERF) in risk-informed regulation applications is a good idea. However, the generic guidance provided in Appendix B of DG-1061 is conservative, likely leading to unacceptable LERF levels for essentially any application as well as the base case. For appropriate decision making, the risk model "should be as realistic as practicable" as noted on page 1-1 (Section 1.1) of DG-1061. Thus, the simplified model in Appendix B should be modified or deleted.

- While it is implied at various places in the guidance that the degree of defense in depth at times may be reduced by a proposed risk informed change, that allowance is not implied in the listing of the five Key Principles. In fact, the implication is to the contrary when principle #2 "defense in depth is maintained" is contrasted with principle #3 "sufficient safety margins are maintained." The allowance for a quantitative decrease in defense in depth, albeit likely quite small, should be explicitly stated. (p. 2-1 of DG-1061)

- The SRP for Inservice Testing (IST) appears to place restrictions on the concept of bundling in that it is implied that the risk increase component must be low, presumably regardless of the magnitude of the risk decrease component. This would seem to preclude the basic benefit of bundling and thus the incentive to use the technique. (Low risk increases are already acceptable without bundling.) Perhaps the intent is to preclude large numerical risk increases being balanced by non-quantified risk decreases in view of the phrase "even if all of the factors contributing to the overall change in risk are not quantified" However, if the risk quantification for both risk increases and decreases are similarly quantified, the restriction to low risk increases should apply only to the net result. The language and intent of the next to last paragraph of Section II.A.10 should be clarified. (p.3.9.7-17 of SRP Chapter 3.9.7)

- On p. 3.9.7-25 of SRP Chapter 3.9.7, the sentence beginning "To use the lower plant-specific failure rate, it must be demonstrated that the plant-specific failure rate data came from a population statistically different from the generic population... ' is confusing. Perhaps the meaning of "population statistically different" is at issue. This should be clarified.

- For the purpose of clearer application to support state (large event tree) models as well as linked fault tree models, it would be helpful to use the more fundamental definition of Fussell Vesely importance (FV) such as given in NUREG/CR-3385 ("Measures of Risk Importance and Their Applications" by W. F. Vesely et. al.) rather than the definition contained on p. A-3, Appendix A of NUREG-1602. The latter defines FV as the sum of the probabilities of the cutsets containing the event of interest divided by the sum of all cutsets. The cited Vesely report essentially defines FV as the difference in risk level between the base value and the value obtained by guaranteeing success of the given event divided by the base value. (i.e. fractional reduction in risk due to guaranteed success of the event) The close relation to the risk reduction importance measure becomes immediately evident through their similar definitions. It is true that FV is mathematically equivalent to the sum of the cutsets containing the event of interest divided by the sum of all cutsets as stated in Appendix A, but only because the cutsets are minimal cutsets. If applied to sequences generated by a typical support state model event tree quantification, that identity is no longer true in most instances because the sequences are often not minimal. That is, some sequences will contain the event of interest, but that event failure is not necessary to produce the sequence failure. The importance measure obtained by adding such sequences and dividing by the sum of all sequences is typically called the "probabilistic importance," and it will usually be different (larger) than FV. The more limiting and potentially misleading definition of FV cited in Appendix A is repeated by inference on page 4-3 of DG-1064. However, the correct definition is given in the Glossary on p. G-4 of the unbounded version of draft NUREG-1602 though that Glossary has been omitted from the bound version.

- It should be noted that FV can also be shown to be the slope of the straight line plot that relates fractional change in risk (e.g. CDF) expressed as a ratio of changed value to base value to the fractional change in failure rate of the event of interest (e.g. component failure rate) expressed as a ratio of changed value to base value. This recognition is useful in FV interpretation particularly in the use of FV in ranking applications.

- The use of a risk-informed approach to regulatory change is cited in several places as an optional approach; this assertion was confirmed by the flowchart titled "Decision Logic for Submittal Review for Changes to Current Licensing Basis" presented by NRC at the Workshop. However, the statement was also made that non-risk-informed applications may generate risk questions by the NRC. Can such questions be answered by a deterministic approach not involving quantitative risk values? If not, the stated option regarding the use of a risk-informed approach is misleading.

The overall impression gained by the review of the subject draft guidance documents as they now read is that extensive utilization of proposed risk-informed changes to a plant's CLB would not be cost beneficial. This view is compounded by what we perceive to be current NRC philosophy as expressed in the recent decision to maintain the containment spray system in the Westinghouse AP600 design despite what appears to be an overwhelming risk argument based on a presumably state-of-the-art PRA to delete the system. (Inside N.R.C. July 7, 1997). The chief reason appears to be "uncertainty", which also appears to be the driving force for much of the extensive efforts required in the subject guidance. This in turn appears driven by the desire to positively assure that the safety goals are not exceeded. It must be remembered that the CDF and LERF values that are treated as absolute limits in the proposed guidance are subsidiary or secondary goals, and it is our understanding that there is a substantial margin, particularly for CDF, between these secondary goals and the public health effect safety goal. Thus, even when a given plant is near the secondary safety goal for CDF of 1E-4/yr and a proposed change is in the desired range of approximately 1E-6/yr for CDF increase, there would have to be rather large unresolved uncertainty levels to create serious concerns of exceeding the public health based goal. For plants with substantially lower base CDF values such as Fermi 2, the margin is correspondingly greater, further reducing the need for extensive uncertainty analysis.

Adding to our concerns is the case at hand of our pending request for extension of emergency diesel Technical Specification AOT. The risk impact of the change appears small and consistent with or even less ambitious than other plants that have been granted similar requests. The guidance statement "If there is a baseline for approving similar TS modifications for similar plants, then only the differences between previously accepted submittals and the one under review would need to be assessed", should apply. (p. 14 of SRP 16.1) Similarly, the guidance statement "If the justification for the modification is based on well founded traditional arguments that are easily supported by PRA insights, then only a limited PRA review may be warranted" should also apply. (p. 13 of SRP 16.1) Yet, it appears that the inclusion of the risk informed ingredient has led to extensive review and iterative requests for additional information so that the application is still pending after almost two years.

Hopefully, much of the current perception of the draft guidance documents is due to misinterpretation of the guidance intent, particularly with regard to areas where modest changes are proposed and/or the validity of technical judgement is obvious. The perceived excessive analysis for changes that produce small computed increases in risk and that are usually complemented by traditional evaluations will likely be a stumbling block to extensive beneficial implementation of the risk-informed approach. Hopefully, the content of the final guidance documents will alleviate this concern.

A final comment comes in the form of a suggestion. It appears to us that the lessons learned and conclusions reached via the related pilot programs are key to issuance of realistic guidance documents. However, these projects are not yet completed. It would seem prudent to provide for one extra iteration in the development of final guidance. The sequence of events could be as follows;

- Disposition comments received following the Workshop and comment period.
- Following completion of the pilot projects, NRC would modify the subject guidance as appropriate based on lessons learned and at the same time provide the pilot results to the public.
- Send the modified guidance out for a final review with a fairly tight schedule.
- Disposition comments and issue as final.

While this would incur some delay, we too are anxious to resolve the risk informed regulation issue, these are important course setting documents and deserve the benefit of all significant, relevant, and available input. Short of this recommended modified review approach, it is urged that information from the pilot plants continue to be scrutinized and utilized in the development of the final guidance documents. Further, if new information is developed after issuance of the final documents that has significant impact on the their content, it is highly recommended that the appropriate revisions be made in a timely manner, not waiting for some preset longer review period to be achieved.

If you have any questions on our comments, please contact Mr. Earl Page at (313) 586-4266.

Sincerely,

William O'Connor, Jr

cc: L. Bugoci
S. Hsieh
W. Tucker