



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

NOV 26 1985

47
Miraglia
859324ns

MEMORANDUM FOR: Harold R. Denton, Director, NRR
James M. Taylor, Director, IE
Robert B. Minogue, Director, RES
John G. Davis, Director, NMSS
Clemens J. Heltemes, Director, AEOD
Thomas E. Murley, Regional Administrator, Region-I
J. Nelson Grace, Regional Administrator, Region-II
James G. Keppler, Regional Administrator, Region-III
Robert D. Martin, Regional Administrator, Region-IV
John B. Martin, Regional Administrator, Region-V

FROM: William J. Dircks
Executive Director for Operations

SUBJECT: DAVIS-BESSE EVENT - NRC LESSONS LEARNED

In my August 5, 1985 memorandum on staff actions resulting from investigation of the June 9 loss of feedwater event at Davis-Besse, I assigned responsibility for a number of generic and plant-specific actions identified in the report of the NRC investigation of that event (NUREG-1154). I also directed an in-depth and searching reappraisal of NRR, IE, AEOD, RES and Region III programs in the light of the June 9 event.

I have reviewed the responses to that memorandum and the action plans that have been developed by the offices for addressing those assigned actions. I also have met subsequently with the program directors to review progress in initiating and implementing those action plans. I believe that the actions that are already underway or planned by the offices are a good start in addressing immediate needs with respect to the specific action items assigned. I will continue to meet with the program directors periodically to review progress toward completion of their initiatives. I have also reviewed carefully the program reappraisals provided by the individual offices, and I believe there is need for further strengthening of our agency programs beyond the improvements indicated in the program office proposals.

The broad picture that emerges from my review of all the assessments that have been done to date of the Davis Besse event and its implications, points to the need for improvements in the three major areas indicated below. I believe that the points discussed below reflect the major lessons learned from the Davis Besse event. To the extent that your program improvement plans do not now include explicitly specific measures to address these points, in their final forms the plans will have to be modified to do so.

1. More Timely Identification and Completion of Safety Issues

Our safety review and inspection programs as currently structured have proven capable of identifying problems in plant design and licensee performance that could adversely affect safety (e.g., the lack of diversity/reliability in the Davis Besse AFW system design, and the pattern of low/

8512060378

KA

7pp.

deteriorating SALP ratings for Davis Besse). However, we have not always reacted to indications of problems provided by these programs in a way that led to timely correction of the problems identified. Although program improvements already planned by the offices, as indicated in the responses to my August 5 memorandum, should contribute substantially to correcting this weakness, the aspects of program improvement in this area that need more attention are the establishing of criteria for identifying deterioration of plant performance and the tracking of identified issues. Explicit provisions should be made in our improvement plans for development of an improved methodology for determining when facilities should be placed on an NRC required "performance improvement program." Likewise, we must promptly develop and implement a more-fully integrated tracking system that will maintain accurate status of the complete range of outstanding licensing actions, pending generic issues, and approved backfits that must be dealt with, to better focus management attention on identified problems until necessary action is taken or completed. I have already identified some of the tracking and interoffice coordination problems that need to be addressed more effectively, in a September 5, 1985 memorandum to the Directors of NRR and IE on monitoring the completion of generic issues. This beginning must be expanded upon. All offices that have a role in the identification, generation, imposition, or verification of compliance/completion of new requirements by any means share in the responsibility for development and implementation of the improved issue management system.

An important corollary to the need for keeping NRC management aware of the status of pending issues and approved-but-uncompleted licensing actions is the need to keep licensees similarly informed. We must be explicit, as well as timely, in communicating to licensees NRC's understanding of the status of pending safety issues or approved licensing actions. This is particularly true in cases where the staff's evaluation and the final NRC decision regarding a licensee's submittal on an important issue extend for an appreciable length of time, as in the case of the Davis-Besse AFW system design adequacy question. Extended delay and regulatory silence on the part of NRC in such circumstances can be misinterpreted as implicit or defacto acceptance by NRC of a position on which the staff is undecided or which the staff might even regard as unacceptable. These points are important enough that they need to be addressed explicitly in the program improvement plans.

2. Broader Consideration of Positive and Potentially Negative Safety Impacts of Regulatory Actions

Our current methods for assessing the safety impacts of changes to plant equipment or procedures, whether proposed by licensees or imposed by NRC, need to be improved to provide a broader and better understanding of both the positive and potentially negative effects of equipment and procedure modifications. The backfit decision which resulted in the installation of the SFRCS at Davis Besse, and other changes such as valving out the feedwater startup pump, resulted in unintended, unanticipated safety effects that contributed to and complicated the June 9 event at that

facility. This was because the staff safety evaluations involved focused too narrowly on some specific safety concern or criterion (e.g., seismic qualification or protection against main steam line break) and did not adequately take into account the other potential ramifications of such actions. Another example of focusing too narrowly on an immediate safety concern or objective (not just in the Davis-Besse context) can be seen in the requirement for cold-fast-start testing of diesel generators. That testing was intended as a means of demonstrating the reliability of the emergency power function on demand under stringent conditions. But, focusing too narrowly on demonstration of that capability (by harmful testing) actually resulted in degrading that capability in a number of operating plants.

Increased application of analysis techniques, such as PRA, that are specifically designed to provide a more-fully integrated treatment to the many interrelated aspects of the complex safety issues that arise, can contribute significantly to the broader understanding that is needed of both the positive and potentially negative effects of our regulatory actions. PRA methods are inherently less likely to recognize artificial distinctions in perceived safety importance between safety-related and nonsafety-related plant features. Such artificial distinctions reflect the more simplistic approach that has been taken in our safety analyses as reflected in still-existing "deterministic" licensing criteria and requirements. Clearly, this current approach can be seen to be a fundamental causative factor in a number of instances in the past where an intended fix of one problem has unexpectedly created or led to a more serious problem.

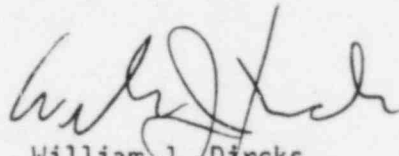
More emphasis needs to be given to increased application of improved analysis methods (specifically PRA) in all aspects of our regulatory activity. Such increased emphasis is necessary not only to provide a broader perspective in our assessment of the full impact of any proposed changes in the future, but to provide a framework and a viable means for determining whether there are other examples, as yet undiscovered or unrecognized, of well intended past regulatory actions that may be having an undesired effect.

3. Increased Emphasis on Balance of Plant Equipment

The paramount importance of proper maintenance in maintaining levels of reliability assumed in the safety analyses that form the licensing basis for operating plants has been accorded greater recognition and increased emphasis and attention by both NRC and utility management in the aftermath of the TMI accident. However, it appears from the circumstances noted in the review of the June 9 Davis-Besse event that an inappropriate, artificial distinction (alluded to in 2. above) between the importance of safety-related vs nonsafety-related plant features may have led some licensees to place inadequate emphasis on proper maintenance of all equipment necessary to assure proper facility operations. Some balance-of-plant systems may actually have equal or perhaps greater safety importance (cumulatively) than equipment classified as safety-related

because their too-frequent failure can needlessly challenge the safety-related systems, and their failure can also aggravate conditions under which the safety-related systems must respond. We need to give increased attention to assuring that the attention of licensee management is focused properly on this important aspect of plant operations and that important balance-of-plant systems and equipment receive adequate attention in the overall maintenance picture. We should also consider seriously, in the context of finalizing our improvement plans, whether this requires significantly increased commitment of regulatory attention to balance-of-plant areas within our licensing review and inspection programs.

I want to meet with you to discuss further the matter of program improvements. I will be scheduling a meeting within the next month or so for that purpose. I would like to receive your written reactions and comments to the above in advance of that meeting. Please provide me with your preliminary views by December 16. I have included in an enclosure to this memorandum some important general points and specific questions that I want you to consider for discussion at the upcoming meeting to help decide those additional internal program improvements which should be implemented.



William J. Dircks
Executive Director
for Operations

Enclosure
Important General Points
and Specific Questions for
Discussion

DISCUSSION POINTS

A. Important Points for Consideration Regarding Program Improvement Identification

1. There is much about our existing regulatory programs and processes that work, and work well. Those aspects of our current programs that do work, demonstrably and effectively, should for the most part be left alone now. We should concentrate our improvement efforts on program aspects that clearly need to work more effectively. With regard to the SALP process specifically, for example, in its existing form that program effectively identified before the June 9 event the need for improvement in licensee performance in areas highlighted subsequently in the NRC investigation following that event. The problem, therefore, was not that the SALP process failed to identify problems. The need for further improvement in the SALP process (beyond changes already planned in the imminent SALP Manual Chapter revision) would appear to lie principally in the program managers' recognizing and reacting somewhat sooner to SALP trends indicating poor or deteriorating licensee performance.

Similarly, the safety review process, as it is currently conducted within NRC, did identify basic questions regarding the adequacy and reliability of the Davis-Besse AFW systems configuration, and resulted in a continuing pressure to upgrade its design and improve its reliability over a longer period of time. The problem is that the period of time involved was too long. In retrospect, it does seem likely that the perspectives provided by a more-fully integrated treatment of that system's less desirable features (such as the SFRCS, and the locking out of the standby feedwater startup pump) had they been available earlier, would have brought things to a head with regard to final disposition of that issue before the occurrence of the June 9 Davis Besse event. It is also likely that the existence of the improved issue management system referred to above, might have kept management attention focused more effectively on that situation and brought about earlier resolution of that issue. The message, again, from all this is: we must avoid change for change sake in the heat of this particular moment. I see no need for fundamental or wholesale change in our programs. What is needed are judicious improvements on what are, for the most part, well-working programs. We need to concentrate our efforts in those areas where the need for improvement is strongly and broadly indicated.

2. There has been criticism directed at the use of PRA in our regulatory activities, to the effect that reliance on PRA in determining the priority of a safety issue contributes to inordinate delay in dealing effectively and promptly with issues that are identified; e.g., the AFW safety issues that had been identified at Davis-Besse. It is

likely true that, if our licensing decisions regarding Davis-Besse had been made solely on the basis of deterministic-type criteria and judgments to the exclusion of any probabilistic analysis input, NRC would long ago have required Davis-Besse to provide a diverse AFW system design. The balancing consideration is that we would likely also have required that utility and other utilities to do many other things, a number of which would now be seen as unnecessary for safety in the light of insights provided by PRA. As we learned in the aftermath of TMI, the undisciplined proliferation of requirements that can result when we restrict ourselves solely to use of deterministic-type criteria and engineering judgment can adversely affect safety. Equally important, the improved, more-fully integrated treatment of safety issues (the need for which I have previously emphasized) can only practicably be achieved at this time by systematic analyses within the framework provided by PRA methodology. So keeping in mind the uncertainties and limitations of PRA methods as they have evolved to this point, and appropriately taking into account such uncertainties and limitations in our decisionmaking, we must continue to apply and even broaden our application of those powerful integrating methods to achieve important program improvements that can be demonstrated to be necessary. I would expect to see, therefore, in the comprehensive plans for program improvements that result finally from our upcoming discussions, proposals for increased use of PRA in determining safety importance of issues identified for regulatory action, in determining inspection methods and focus, in prioritizing operational experience review efforts, determining research programs, etc; in short, in every phase of our activities.

B. Specific Questions To Be Considered in Determining Additional Program Improvements

Questions

1. Should NRC as a matter of policy concentrate more heavily on balance-of-plant systems in our full range of regulatory activities?
2. What is the most efficient and effective means of examining retrospectively whether, in the absence of a more-fully integrated evaluation of safety issues in the past, we have prescribed actions (such as locking out valves/pumps/breakers) or approved installation of systems (such as SFRCS) in licensing contexts other than Davis-Besse that could have unintended, adverse effects on safety?
3. Are administrative control measures like locking or chaining valves driven principally by security or safety concerns? If safety is the driving concern, wouldn't use of more easily broken seals or other such "flags" satisfy the safety purpose involved (i.e., inadvertent operation) in many areas? If security was the driving concern in implementing such measures, has adequate consideration been given to alternative measures that could be more easily overridden in the event of an emergency?

4. Should serious consideration be given to moving away from testing of individual components of safety systems during normal operation as a means of verifying or assuring operability, to more integrated testing of systems during outages?
5. Should we develop criteria which mandate when a licensee is to be required to implement a "Performance Improvement Program"?