Florida Power
CORPORATION

September 27, 1995
NL95-0089

Secretary, U. S. Nuclear Regulatory Commission
Attn: Docketing and Services Branch
Washington, DC 20555

Subject: Docket No. PRM-50-61, Comments on Proposed Appendix S to 10 CFR 50 [60FR29784]

Reference: FR Doc. 95-13755, Filed 6-5-95

Dear Sir:

Appropriate members of the Florida Power Corporation (FPC) staff have reviewed the proposed Appendix S to 10 CFR 50, and offers the comments included in Attachment 1.

Sincerely,

Larry C. Kelley, Director
Nuclear Operations Site Support

LCK/SCP:ff

Attachment

DS:0

Attachment 1
Comments on Proposed Appendix S

General

Florida Power Corporation (FPC) supports the proposed Appendix S as an improvement over the existing Appendix R, specifically on the basis that it allows utilities to apply fire protection resources in proportion to the safety significance and safety sensitivity of plant areas. This could be done under Appendix R through exemptions, however experience has shown that this is a cumbersome labor intensive process. The recent controversy over Thermo-Lag and indictment and trial of the materials producer suggests that NRC reviewers may be less likely in the future to grant exemptions, making the process even more burdensome to both the utilities and the NRC staff. This observation is based on recent 10 CFR 50.54(f) Requests for Additional Information that have required increasingly detailed and specific answers to questions that were never considered previously.

The following sections are specific answers to the questions posed by the NRC in the Federal Register Notice of June 6, 1995 and are titled like the questions.

Scope

Regarding questions of the applicable scope of the proposed Appendix S, FPC agrees with the focus on preservation of safe shutdown capability. The charter of the NRC is protection of the health and safety of the public. FPC's responsibility also includes health and safety of the public but, in addition, includes the responsibility to our stockholders for preservation of assets, including prevention of loss from fire. It is therefore appropriate that the NRC rules provide reasonable assurance that fire protection features will protect the reactor fuel integrity and assure that the plant can be safely shutdown. This does not require the same level of protection in all plant areas. FPC and Crystal River Unit 3 (CR-3) management have the responsibility to assess the hazards from fire damage in all areas of the plant and assure that the likely effects of fire will not result in unsafe conditions or financial loss. It is inappropriate for NRC rules to dictate levels of protection for plant areas which pose no threat to public safety.

Improved technology and experience with probabilistic safety analysis (PSA) and fire effects modelling are available now that were not available when Appendix R was promulgated. These tools provide a basis for assessing the relative effects of fire in a given plant location and the likely severity of damage inflicted. The results of these analyses can be used under proposed Appendix S criteria to determine the appropriate level of protection to be applied in various plant areas. This will allow FPC management to decide on the necessary mix of protective features and the most judicious application of resources to assure protection of the public and of our assets.

It seems logical that the use of improved technology would be acceptable, however, to this point the NRC staff has been reluctant to allow the use of these tools, and has demonstrated clear opposition to their application to resolving Thermo-Lag fire barrier issues. Opposition to the use of probabilistic approaches has been demonstrated in presentations to both the NRC Commissioners and the ACRS, and was recorded in correspondence to FPC on Thermo-Lag issues in September 1994.

Safety-Neutral

In posing the question of proposed Appendix S being 'safety-neutral' the NRC staff implies that Appendix R is a desirable standard for safety assurance. FPC does not believe that Appendix R represents good safety regulation and points to the fact that there have been over 1200 exemptions approved by the NRC and many more are pending. This large number of exemptions suggests that Appendix R is overly restrictive and presents marginally workable solutions to fire protection issues. FPC feels that Appendix S should be judged on its own merits and not as compared to Appendix R.

In this regard the safety significance of fire as a threat to safe plant operation must be considered. In the application of Appendix R the NRC staff has adopted the ASTM E-119 time-temperature curve for assessing the one and three hour fire barrier endurance required. The history of fire events in the US nuclear industry shows that it is highly unlikely that a fire of this magnitude will occur in any plant. The NRC staff in its own assessment, following discovery of problems with Thermo-Lag fire endurance, determined that the overall safety significance of fire as a threat to nuclear power units is low.

As with the use of the E-119 standard for implementation of Appendix R, the guidance documents that are developed for application of a rule can dramatically impact the effect and effectiveness of a rule. As is pointed out in your discussion of Implementation Guidance, such documents do not exist for Appendix S. However, experience does exist in the use and application of modelling and PSA in other nuclear safety issues. This experience will allow the choice of appropriate safety goals for fire protection that are consistent with the threat from other accident or event scenarios. Therefore, it is not necessary or appropriate to compare Appendix R to Appendix S. Instead Appendix S should be viewed as an opportunity to establish realistic safety goals for fire protection.

Implementation Guidance

FPC believes that implementation guidance should establish goals for safety performance of fire protection systems that takes into account the contribution of all elements of the classic fire protection defense-in-depth concept. This should include the location of ignition sources, frequency of ignition occurrence, location of combustibles, effectiveness of administrative controls, location of targets, presence of fire barriers and their performance, presence of automatic suppression and detection, effectiveness of manual suppression, operator response actions, and realistic fire damage potential. Techniques for computing the contribution of each element should be proposed by the industry for approval by NRR, and acceptable levels of integrated performance should be established. Utilities should then be free to apply accepted techniques, to identify and implement the appropriate mix of protective features to each unique situation. Verification should be the utility's responsibility, with oversight and review by Regional Inspection and Enforcement.

Process for Burden Relief

FPC believes that adoption of Appendix S is the preferable approach to obtaining relief from non-prod[illegible]e requirements. In our view it would be more efficient for the NRC Staff to approve a generic process for application of Appendix S that could be followed by all interested utilities, rather than approving individual unique licensee approaches. As pointed out in your discussion, the GL 86-10 process does not apply to all areas of Appendix R. Appendix S offers a more

comprehensive alternative, and maintains the option of continuing to follow Appendix R for those subjects that are acceptable to a utility.

Content of Performance-Oriented and Risk-Based Regulation

This discussion questions if there are other viable approaches to implementing risk based regulation of fire protection. Obviously there are. Is this the absolute best approach? That is impossible to determine, however significant effort by NEI and member utilities has been expended to create the proposed Appendix S. This effort should not be tossed aside in hopes of finding some marginally better approach, with the attendant additional expenditure of limited NRC Staff resources and obvious delays that will undoubtedly occur.

It is suggested that the principal performance parameter to be measured should be time. Plant layout establishes the relative locations and types of fire ignition sources and safe shutdown structures, systems, and components (SSCs). PSA and fire modelling can determine the probable effects of a fire on plant safety due to damage to SSCs and the estimated time for damage to occur. The performance of automatic detection and suppression, the performance of fire barriers, and the performance of manual suppression activities can be measured in units of time. Probabilities and error ranges can be established for these measures. Comparisons of the time to damage and time required for effective mitigation of fire effects can be made to assess overall 'fire protection system' performance.

Regarding existing Appendix R exemptions, yes, they should remain valid. The existing exemptions were granted based on the effectiveness of defense-in-depth features that could compensate for other features that did not meet the prescriptive requirements of Appendix R. It is our view that those same features will be evaluated together as a 'fire protection system' under a performance based evaluation to determine adequacy. Therefore, the basis for previous acceptance of Appendix R exemptions, and for assessing Appendix S performance based acceptability, will be similar.

Voluntary Adoption in Whole or in Part

As noted above, the judgements on the effectiveness of alternatives proposed via Appendix R exemption requests and Appendix S performance based solutions both rely on the principles of defense-in-depth. It is anticipated that the application of Appendix S will result in approved techniques for calculating the combined effectiveness of various fire protection features vs. fire hazards. As such, it will be a quantification of the bases for judgements made under Appendix R. Since this common basis exists, it would seem appropriate for utilities to implement fire protection based on the 'best fit' of alternatives from either or both Appendices.

Allowable Repairs During Fire Events

This question is related to two other questions, namely Implementation Guidance and 72-Hour Requirement to Achieve Cold Shutdown. A significant burden associated with Appendix R compliance is the assumption that disabling fire damage will occur to all safe shutdown SSCs in a fire area regardless of layout, contents, and combustible loading. Another significant burden results from using the ultra-conservative ASTM E-119 time-temperature curve as the standard for measuring fire barrier performance. These two positions were established via

guidance documents and create standards for post fire safe shutdown analysis which are unrealistic for nuclear power plant application.

If more realistic application guidelines are established which permit evaluation of damage potential based on observable plant conditions, then requiring one train of safe shutdown SSCs *necessary for initial response* to remain free from fire damage is reasonable. Where it can be demonstrated that a component or system is not needed initially and not for 24-48 hours, then repairs should be allowed. Such repairs should not be limited to mode dependent equipment such as currently exists for Appendix R. A performance based solution should allow 'repairs' that can be demonstrated to be achievable within the required window. Additionally, currently there is conflicting opinion as to what constitutes a 'repair' and what may be identified as an operator action. This distinction should be clarified.

Automatic Actuation of Suppression Systems

There is a genuine concern that automatic suppression systems may actuate spuriously or due to human error and create events which challenge nuclear safety. Typical plant areas of concern are control rooms, essential switchgear rooms, relay rooms and areas housing vital power supplies. A performance based solution to fire protection in one of these areas should allow a combination of detection, barriers rated to withstand a realistic fire in the area, personnel response to mitigate the effects of a fire, and fire brigade response to extinguish a fire. An effective fire protection system could be demonstrated without the existence of automatic suppression, but using a combination of features not specifically accepted under Appendix R.

Alternative and Dedicated Shutdown Capability

The proposed Appendix S does not differentiate between shutdown using normal plant equipment and shutdown using 'alternative or dedicated' equipment. Instead, one functional capability standard is established for any combinations of existing or new shutdown systems. There will be no difference in the functional capability that will result, and no difference in the level of safety achieved.

In regard to the types of procedures that are used, those procedures should be chosen by the utility to fit their individual circumstances. It seems that plant safety will best be served if a consistent set of instructions, such as current EOPs, are used to respond consistently to the symptoms of an upset condition, and not to a particular initiating event. The actual response to a fire will be dispatching the Fire Brigade to combat the fire, while the Operating Crew monitors plant conditions for signs of functional upset. When upset operating conditions are noted, the Operations Crew should respond to any degraded conditions according to the observed symptoms as directed by EOPs. If there are specific actions necessary to mitigate potential fire induced failure modes for a specific fire area, such as opening certain breakers, those should be specified in APs. Otherwise the Operating Crew response should be the same for a given set of symptoms, according to EOPs, regardless of the initiating event (fire, flooding, line break, etc.)

Your discussion notes that 'fires can cause rapid and widespread damage.' While the nuclear industry has experienced some threatening fire occurrences, most have been small fires which were quickly contained. A large fire involving diesel fuel, generator cooling hydrogen, or turbine lubricating oil could occur.

However, in most fire areas, low combustible loading, the type of combustible materials that exist, and the inefficient ignition sources that are present makes a severely damaging fire highly improbable. Safe shutdown analyses are conducted under the assumption that a fire not only disables all functions in an area that are unprotected, but that a 'smart fire' causes the most disruptive spurious operations. While this level of conservatism is a good idea for performing a safe shutdown capability analysis, it would be imprudent to respond to a fire as if this highly unlikely set of conditions had occurred or was imminent. It is much more logical to respond to actual conditions as they are encountered, consistently, without regard to initiating event.

72-Hour Requirement to Achieve Cold Shutdown

Is there a specific basis for the Appendix R requirement to reach cold shutdown within 72 hours? Depending on the systems that are available for achieving cold shutdown, limitations on plant cooldown established by other analyses may conflict with the 72 hour requirement. It appears that this was an arbitrary figure not supported by specific analysis, and therefore its elimination from Appendix S would have no negative safety impact.

Rulemaking Finding

No comment.

Exemptions

We believe that the correct interpretation of the language regarding exemptions to Appendix R is as you state. "The language could be interpreted as intending to make clear that licensees who choose to comply with a specific Appendix S provision should not lose its exemptions to those portions of Appendix R for which the licensee continues to be in compliance."

Regulatory Analysis

No comment.

Additional Comments

FPC believes that the threat to nuclear safety from a fire is very low, and the use of tools such as PSA and Fire Modelling offer an opportunity to quantify that risk. Therefore, the use of these tools to demonstrate compliance under Appendix S is a step in the right direction for both the industry and for the NRC. FPC is concerned however that the potential improvement in our collective ability to match fire protection features to the threat from fire may not be realized if existing guidance documents for Appendix R are not revised. Specifically there are prescriptive elements of current fire protection regulations that will remain, and even expand in scope, if present guidance documents are not revised.

For example, Generic Letter 81-12 establishes the performance requirement for safe shutdown systems covered by Appendix R Section III. L. One specific requirement contained is that protection must be provided for reactor neutron source range indication. Without revision this could be interpreted as a requirement for all post-fire safe shutdown equipment sets. Similarly, Generic Letter 86-10 establishes the standard test for fire barrier endurance as the ASTM E-119 time-temperature curve. This is an extremely conservative test criteria which severely over estimates the fire conditions likely to be encountered in an

operating nuclear power plant. Consideration should be given to developing a family of fire severity curves for qualifying barriers according to the combustible load in a given area.

FPC appreciates your consideration of the foregoing comments.