(22)

RULEMAKING ISSUE
NOTATION VOTE

SECY-02-XXXX

FOR: The Commissioners

FROM: William D. Travers
Executive Director for Operations

SUBJECT: RULEMAKING PLAN ON FIRE PROTECTION MANUAL ACTIONS

PURPOSE:

To obtain the Commission's approval to proceed with rulemaking to revise fire protection program requirements contained in Appendix R of 10 CFR Part 50 and associated guidance to resolve a regulatory compliance issue. This paper also requests the Commission's approval of the staff's plan to propose an interim enforcement policy to exercise enforcement discretion related to the fire protection compliance issue pending completion of rulemaking.

BACKGROUND:

NRC's fire protection requirements prescribe a defense-in-depth approach to protect safe shutdown functions, through (1) fire prevention activities (limits on combustibles through design, construction, and administrative controls); (2) the ability to detect, control, and suppress a fire rapidly (fixed systems and trained fire brigades); and (3) physical separation of redundant safe shutdown trains (distance and fire barriers).

10 CFR 50.48 backfit the fire protection requirements of Appendix R, Paragraph III.G.2, for plants licensed to operate before January 1, 1979. Appendix R, Paragraph III.G.2 specifies three methods, any one of which is acceptable, to provide reasonable assurance that at least one means of achieving and maintaining safe shutdown conditions will remain available during and after any postulated fire in the plant. The three acceptable methods of protecting at least one shutdown train during a postulated fire when redundant trains are located in the same fire area are:

1. Separation of the redundant system by a passive barrier able to withstand a fire for at least three hours; or
2. Separation of the redundant system by a distance of twenty feet containing no intervening combustible material, together with fire detectors and an automatic fire suppression system; or

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3. Separation of the redundant system by a passive barrier able to withstand a fire for one hour, coupled with fire detectors and an automatic fire suppression system.

Plants licensed to operate after January 1, 1979, are not required to meet Appendix R regulations. For these plants, the staff reviewed the fire protection programs against the regulatory guidance in Branch Technical Position (BTP) CMEB 9.5-1 or the Standard Review Plan (NUREG-0800) which incorporated the provisions of Appendix R, Paragraph III.G.2. Most licensees committed in their fire protection plans to meet the Appendix R, Paragraph III.G.2, equivalent regulatory guidance. These commitments would then become part of the licensing basis for the post-1979 plants.

During recent inspections of licensee fire protection programs, concerns have arisen about licensee compliance with fire protection of redundant safe shutdown systems that are located in the same fire areas. The principal nature of the concerns are summarized as follows:

a) Instead of providing separation and fire protection systems to protect the safe shutdown capability of redundant trains located in the same fire area, there are numerous instances where licensees are relying on "manual actions" that have not been approved by the NRC. "Manual actions" refer to those actions needed to achieve and maintain safe shutdown during a fire by using operators to perform field manipulations of components that would not ordinarily be necessary if the train were protected from fires as prescribed by the regulations or licensing commitments. Specifically, the staff is concerned that many of these licensees have implemented manual actions without NRC approval of an exemption to Appendix R (for pre-1979 plants) or a deviation to their fire protection program commitments (post-1979 plants).

b) The staff is also concerned that in some instances, where manual actions are relied upon to ensure safe shutdown capability, the manual actions may not be feasible when factors such as complexity, timing, environmental conditions, staffing ,and training are considered.

It is the staff's understanding that most of the unapproved manual actions came about during the resolution of the Thermo-Lag fire barrier issue in the mid-1990s. The staff believes that many licensees utilized manual actions rather than upgrade or replace the Thermo-Lag fire barriers that were originally installed to comply with Appendix R requirements. Furthermore, it is the staff's understanding that most of the licensees that rely on unapproved manual actions have done so on the basis of a 10 CFR 50.59-like change process allowed by their operating licenses. The change process is specified in a standard license condition that allows licensees to change their fire protection program without NRC approval provided that the change has no adverse impact on the ability to achieve or maintain safe shutdown in the event of a fire.

When the fire protection regulations were promulgated, it was recognized that there would be plant conditions and configurations where strict compliance with the prescriptive fire protection features specified in Appendix R or associated guidance would not significantly enhance the level of fire safety already provided by the licensee. In cases where a fire hazards analysis demonstrated that manual actions provided an equivalent level of fire safety to Appendix R or associated guidance, it was expected that licensees would seek NRC approval to use manual actions in lieu of providing separation and fire protection systems to protect the safe shutdown capability (both pre- and post-1979 plants). The staff has granted many exemptions to the

technical requirements of Appendix R (pre-1979 plants) or approved deviations from associated guidance (post-1979 plants) that permitted manual actions as an acceptable alternative to the fire protection separation requirements. However, the staff had not envisioned that licensees would use their change process for such significant changes without NRC approval.

The staff sought advice from the Office of General Council (OGC) as to whether Appendix R, Paragraph III.G.2, permits licensees to rely on manual actions in lieu of fire barriers. OGC advised the staff that the regulation cannot be reasonably interpreted to permit reliance upon manual actions with respect to redundant safe shutdown. Therefore, any pre-1979 licensee that is using manual actions without an NRC approved exemption is not in compliance with the regulations.

Fire protection programs for post-1979 plants generally commit to Appendix R, Paragraph III.G.2 (or equivalent guidance) as part of their initial licensing basis. However, commitment to Appendix R, Paragraph III.G.2 (or equivalent) is not legally binding for post-1979 plants. Use of manual actions in lieu of separation and fire protection systems without NRC approval may or may not be a compliance issue depending on how the change was justified and analyzed under the licensee's change control process to demonstrate that the manual actions are feasible and the ability to achieve and maintain safe shutdown had not been adversely affected. However, because of the lack of regulatory criteria on use of manual actions for safe shutdown, post-1979 licensees would have to develop and defend the criteria governing use of manual actions on a case-by-case basis.

Regardless of whether or not manual actions can be implemented by the licensee without NRC approval, the staff is more concerned about the feasibility of such actions. In the past, when the NRC staff had specifically reviewed and approved manual actions (by exemption or deviation), the staff's approvals included the following feasibility considerations:

- Are procedures and/or training for the manual actions adequate?
- Is there adequate time, staffing, or diagnostic instrumentation, based on the progression of the fire or the thermal-hydraulic conditions of the reactor, to permit feasible use of the manual actions?
- Are manual actions conducted in locations with environmental conditions suited for the tasks to be performed (i.e., have temperature, radiation, lighting, accessibility, or other limiting habitability problems been analyzed)?

However, since there are currently no generic criteria for feasible manual actions, the staff is uncertain as to what basis licensees (that rely on unapproved manual actions) used to determine the acceptability of the manual actions.

DISCUSSION:

The staff has had extensive interactions and dialogue with the industry on the manual action compliance concerns over the last year including exchanged correspondence, meetings with industry representatives, and a presentation by the staff on the issue at a Nuclear Energy Institute (NEI) fire protection forum. NEI has surveyed licensees as to the extent that unapproved manual actions are used as a method of protecting a safe shutdown train during a postulated fire when redundant trains are located in the same fire area. In a meeting with the

staff on June 20, 2002, NEI indicated that the use of unapproved manual actions for protecting a safe shutdown train in the event of a fire is pervasive throughout the industry and that most licensees have at least some instances where they rely on manual actions without NRC approval (via exemption or deviation). However, the industry does not agree with the staff that this is a compliance issue and has stated numerous times that the use of manual actions to achieve safe shutdown is acceptable, without prior NRC approval, as long as the reliance on manual actions does not adversely affect the ability of a plant to achieve and maintain safe shutdown.

As stated previously, while the staff is concerned that licensees have implemented manual actions without NRC approval, the staff is more concerned about the feasibility of these unapproved manual actions. It is presumed that most licensees used plant specific engineering judgement and oversight in implementation of manual actions. These changes would need to have been reviewed and approved by a plant onsite review committee. Even so, there is no assurance that all safety concerns related to manual actions have been appropriately assessed by all licensees. Because there is currently no generic guidance or acceptance criteria for what constitutes feasible manual actions, there is no objective way for the staff to determine if any given licensee's manual actions are feasible or otherwise acceptable without performing a detailed plant specific review.

While unfeasible actions might translate to increased core damage frequencies and ultimately increased risk from fires, there is no evidence that this is a generic safety issue—even though the manual actions have not been approved by the NRC. Notwithstanding the staff's concern that some unapproved manual actions may not be feasible, the staff believes that most manual actions are likely to be feasible based on robust change control procedures employed by licensees. Therefore the staff does not consider this an immediate safety issue that requires prompt action. However, because the question of manual action feasibility is associated with regulatory compliance, a remedy must be found.

Given the implied extent of this compliance issue, the staff believes that active enforcement may not be the best remedy for this situation. A concerted enforcement effort related to identifying and correcting manual action compliance on a plant specific basis creates the prospect of significant resource expenditures with uncertain safety benefits. Licensees faced with enforcement actions might flood the NRC with exemption or deviation requests which could divert NRC resources from more significant safety issues and may not result in any net safety improvement if the manual actions are determined to be acceptable.

To resolve the regulatory compliance issue, the staff has evaluated its options in the attached rulemaking plan, the staff has concluded that generic guidance and acceptance criteria for manual actions needs to be developed. The staff believes that it can develop generic acceptance criteria that, when used in conjunction with regulatory guidance, would provide licensees a way of assessing the acceptability of currently unapproved manual actions. Documenting compliance with manual action feasibility criteria would demonstrate that safety has been maintained and that the manual actions do not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. Licensees could assess their plant specific manual actions against the generic criteria and determine what if any additional actions are necessary. However, implementation of this approach would require both rulemaking and interim enforcement policy approval by the Commission.

Specifically, the staff recommends that the Appendix R fire protection regulations and associated guidance be revised to permit the use of manual actions that meet certain acceptance criteria. The manual action acceptance criteria would be included in the rule language along with detailed supportive guidance. The staff has concluded that amending Appendix R and associated guidance to allow the use of feasible manual actions is a safe and acceptable method for protection of safe shutdown capability from a fire (in lieu of fire barrier separation). Furthermore, the staff believes that this rulemaking would have a positive effect on safety by establishing generic criteria for feasible manual actions. The criteria should ensure that manual actions are uniformly evaluated by the licensee and should reduce variability and ambiguity in the licensing basis justifications for manual actions. By codifying the use of manual actions that meet feasibility criteria, the staff will define what manual actions can be utilized without adversely affecting the ability to achieve and maintain safe shutdown in the event of a fire. Upon the establishment of generic criteria for feasible manual action, licensees could then use their fire protection program change control process to adopt manual actions without NRC approval. This course of action would also permit licensees that currently rely on unapproved manual actions to achieve compliance through appropriate analysis and documentation against the feasibility criteria without NRC review and approval.

The staff notes that there may be policy concerns related to this recommended course of action. The proposed rulemaking effectively provides that manual actions that meet feasibility compliance criteria are as acceptable as physical fire barriers. This is a significant policy change in that NRC has previously preferred the use of physical fire barriers over the use of manual actions given the choice. In addition, there is a policy concern regarding the use of manual actions as a resolution of the Thermo-Lag issue. There appears to have been a Commission expectation that Thermo-Lag, where found to be deficient, was to be resolved by replacement or upgrade rather than through the use of manual actions. The basis for this expectation is a statement made to Congress by Chairman Selin in March 1993 (discussed in the attached rulemaking plan). The staff has no safety concerns about using feasible manual actions as an alternative to deficient Thermo-Lag fire barriers where such actions have been previously approved by the staff or where the manual actions have been assessed by a licensee against generic acceptance criteria.

In summary, this approach is justified based on an assessment against the agency's strategic performance goals.

- Amending Appendix R and associated guidance will maintain safety by defining technically acceptable generic criteria for manual actions which can be used to assess the feasibility of existing or future manual actions employed by licensees.
- Development of generic criteria for feasible manual actions will be an efficient and effective method of providing quality and uniformity in licensee assessments and documentation of the acceptability of plant specific manual actions.
- Amending Appendix R and associated guidance to permit the use of feasible manual actions without the need for NRC approval should avoid unnecessary NRC and licensee burden and resource expenditure associated with exemption or deviation processing.
- Amending Appendix R and associated guidance to permit the use of feasible manual actions should reduce the resources expended by both licensees and the NRC with respect to resolving existing manual action compliance issues encountered during plant specific inspections.

The staff realizes that public confidence may be decreased by amending Appendix R to permit the use of manual actions because there is an appearance that regulations are being relaxed to resolve a compliance issue. However, the rulemaking process will permit sufficient opportunity for all stakeholders to comment on the technical criteria governing reliance on and feasibility of manual actions for post-fire safe shutdown which should help offset any reduction in public confidence concerning the technical adequacy of the staff's resolution of this compliance issue.

To avoid any backfit issues with the recommended rulemaking, it would be proposed as a voluntary alternative to the current requirements Appendix R, Paragraph III.G.2.

ENFORCEMENT CONSIDERATIONS

Even with Commission consent to proceed with rulemaking, licensees using unapproved manual actions may not be in compliance until the rulemaking is processed and the regulations and guidance are formally revised. In the interim, rulemaking, by itself, will not avoid potential inspection compliance issues and enforcement proceedings or the related potential of exemption or deviation requests associated with manual actions. To address this potential unnecessary regulatory burden during the interim rulemaking period, the staff would need to adopt conforming enforcement changes, specifically, the staff will also need to propose an interim enforcement policy. If the Commission approves the attached rulemaking plan, the staff intends to develop an interim enforcement policy to exercise discretion and refrain from taking enforcement action for those licensees that rely on unapproved manual actions, provided these licensees have demonstrated and documented feasibility of their manual actions in accordance with preliminary generic acceptance criteria similar to those in the attachment (recognizing that the final acceptance criteria might be modified during the rulemaking process). Although the staff has had numerous interactions with the industry on the manual action compliance concerns over the last year and discussed on a high level what constitutes feasible manual actions, there has not been a focus on the details of manual action criteria. Therefore, should the Commission approve the attached rulemaking plan, the staff would engage stakeholders in at least one public meeting to discuss the detailed manual action feasibility criteria and how it would be used in interim enforcement policy. Shortly after the public meeting, a specific interim enforcement policy would be submitted to the Commission for approval. If the Commission approves the interim enforcement policy, it will be published in the Federal Register together with a Regulatory Information Summary (RIS). The RIS will summarize for the industry and public the expected change in enforcement policy and where the agency is headed with fire protection rulemaking.

RESOURCES

Resources to conduct the rulemaking, modify the associated guidance, and process the interim enforcement policy are estimated at 3.0 full-time equivalent (FTE) over the period FY 2003 - 2004 and are currently budgeted. In addition, contract technical assistance may be needed to revise the regulatory guidance in support of the rulemaking and develop the regulatory analysis. It is estimated that these items will cost no more than $50K in FY03 and $50K in FY04. The staff will address the need for any contract funding in its mid-year review.

COORDINATION:

OGC has no legal objection to the rulemaking plan. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objection to its content. The Office of Enforcement (OE) concurs with the staff recommended approach to an interim enforcement policy for licensees using manual actions in lieu of fire protection separation that have not been approved by the NRC.

RECOMMENDATION:

That the Commission:

1. Approve the attached rulemaking plan to revise 10 CFR Part 50, Appendix R, and associated guidance, as recommended in Option 3 of the plan.

2. Approve the staff's approach to develop an interim enforcement policy relying on preliminary manual action acceptance criteria discussed in the attached rulemaking plan.

William D. Travers
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Attachment: Rulemaking Plan

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RULEMAKING PLAN ON FIRE PROTECTION MANUAL ACTIONS
Revision to Appendix R of 10 CFR Part 50
TAC #MB6148

Regulatory Issue

Nuclear power plant fire protection regulations and associated guidelines prescribe fire protection features to ensure that at least one means of achieving and maintaining safe shutdown conditions will remain available during or after any postulated fire. The staff has concluded that a fire protection regulatory compliance problem exists at many nuclear power plants involving fire protection of redundant safe shutdown trains when these trains are located within the same fire area. Regional inspections, in conjunction with industry discussions, indicate that many licensees rely on manual actions that have not been approved by the NRC rather than using fire barrier separation to maintain safe shutdown capability. Manual actions refer to those actions needed to achieve and maintain safe shutdown during a fire by using operators to perform field manipulations of components that would not ordinarily be necessary if the train were protected as prescribed by the regulations or licensing commitments. Manual actions are not permitted in 10 CFR Part 50, Appendix R, Paragraph III.G.2 for plants licensed to operated before 1979 unless a specific exemption has been given. For plants licensed to operate after 1979, there is uncertainty as to whether manual actions can be used without NRC approval as Appendix R is not required by regulation for those plants (although most plants committed to Appendix R equivalent guidance in their fire protection programs). The staff believes that use of unapproved manual actions (for both pre- and post-1979 plants) constitutes a potential compliance issue.

In addition to the compliance issue, the staff is also concerned (based on some limited inspection findings) that, in some instances, the unapproved manual actions may not be feasible. Because there is no generic guidance on acceptable manual actions, it is unclear how each licensee established the feasibility of needed manual actions. The industry believes that most of manual actions used by licensees for operation of a safe shutdown train during a fire would not have any safety significant feasibility concerns and would likely be approved by the NRC if processed via an exemption or deviation. Even though limited use of manual actions have been approved by the NRC in many previous plant-specific exemptions and deviations, generic use of manual actions has not been recognized as an alternative to providing separation for fire protection of safe shutdown trains. Furthermore, no guidance on the use or acceptance of manual actions for fire protection has been issued by the NRC.

Given the extensive use of unapproved manual actions, the industry is faced with an unresolved compliance issue. The industry's current choices appear to be limited to the following choices:

a) Do nothing and expend resources defending the use of manual actions on a case-by-case basis as they are identified during inspection and enforcement
b) Expend resources preparing and submitting exemption and deviation requests for approval of manual actions on a case-by-case basis
c) Expend significant resources upgrading the fire barrier separation of the safe shutdown trains to meet the Appendix R, Paragraph III.G.2, requirements for those instances where unapproved manual actions are currently credited

Attachment

Based on this compliance issue, the NRC staff is faced with the need to expend resources to evaluate fire inspection findings related to manual actions and the potential need to process a large number of enforcement actions. Additionally, inspecting for manual actions might precipitate a large number of exemptions or deviation requests from licensees that use unapproved manual actions.

Existing Regulatory Framework

The fire protection regulations applicable to a currently licensed nuclear power plant depends on when the plant was licensed. The requirements of Appendix R, Paragraphs III.G were backfit onto all reactors licensed to operate prior to January 1, 1979 by 10 CFR 50.48(b). For reactors licensed to operate after January 1, 1979, the requirements of GDC-3 and 10 CFR 50.48(a) apply. The provisions of Paragraphs III.G are not required by regulation for post-1979 plants, instead, the staff reviewed the fire protection programs against the regulatory guidance in Branch Technical Position (BTP) CMEB 9.5-1 or the Standard Review Plan (NUREG-0800) which incorporated the provision of Appendix R, Paragraph III.G.2. Most licensees committed in their fire protection plans to meet the Appendix R, Paragraph III.G.2, equivalent regulatory guidance. These commitments are part of the licensing basis for the post-1979 plants.

10 CFR Part 50, Appendix R, Paragraph III.G.2 specifies three acceptable methods for protecting the safe shutdown capability of one of the redundant shutdown trains from a fire when located in the same fire area as its redundant train. Basically, one of the redundant trains must be separated from the other redundant train by a 3-hour rated fire barrier; or separated by a 1-hour rated fire barrier with fire detection and automatic fire suppression in the fire area; or separated by a 20 foot horizontal distance with fire detection and automatic fire suppression in the fire area and no intervening combustibles.

Recent triennial inspections found that some licensees have relied on unapproved manual actions instead of providing the specified fire barrier separation measures to meet the Paragraph III.G.2 or equivalent regulatory guidance commitments. It is believed that most of these unapproved manual actions were implemented by licensees as compensatory measures related to concerns about the adequacy of a fire barrier material known as Thermo-Lag. Rather than upgrading or replacing Thermo-Lag, it is the staff's understanding that many licensees evaluated the redundant safe shutdown trains and determined that, by relying on manual actions, any impact of a fire in an area where both trains are located could be circumvented without concern about the fire rating of the barrier material. The staff believes that this was done using the licensee's interpretation of the fire protection plan change control process (a standard license condition similar to 10 CFR 50.59 that was sanctioned by Generic Letter 86-10). The change control process provides latitude in the licensee's need to submit fire protection program changes to the NRC for approval, as long as the licensee can demonstrate that the change does not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

It should be noted that the fire protection requirements for the safe shutdown trains recognize the potential difficulty associated with meeting the prescriptive fire protection requirements in Paragraph III.G.2, and allows the use of alternative or dedicated shutdown capability per Paragraph III.G.3. This paragraph permits the use of manual actions under certain conditions

(described in Paragraph III.L). However, the regulatory issue discussed in this paper does not involve the use of manual actions for alternative or dedicated safe shutdown capability. This compliance issue only affects those licensees that do not employ an alternative or dedicated shutdown system and rely only on the redundant shutdown trains to achieve and maintain safe shutdown during a fire in an area where both trains are located.

The staff sought advice from the Office of General Council (OGC) on whether use of manual actions met the requirements of Appendix R Paragraph III.G.2 if the licensee had determined that the manual actions did not adversely affect the ability of the plant to achieve and maintain safe shutdown in the event of a fire. OGC determined that Paragraph III.G.2 cannot reasonably be interpreted as permitting the use of manual actions.

The staff has concluded that pre-1979 licensees using unapproved manual actions must comply with the regulations either by physically modifying one redundant shutdown train to meet the prescribed fire barrier separation conditions, or, if they wish to continue using manual actions, they must submit exemption requests for NRC for review and approval. Because post-1979 licensees are not required to comply with Appendix R, use of manual actions in lieu of separation and fire protection systems without NRC approval would be a deviation from fire protection program commitments. The deviation may or may not be a compliance issue depending on how the change was justified and analyzed under the licensee's change control process. Post-1979 licensees would need to have sufficient documentation to demonstrate that the manual actions are feasible and the ability to achieve and maintain safe shutdown has not been adversely affected. Establishing the feasibility of manual actions may not be easily accomplished because of the lack of regulatory criteria on use of manual actions for safe shutdown. Post-1979 licensees would have to develop and defend the criteria governing use of manual actions on a case-by-case basis. Although the NRC has previously accepted the use of plant-specific manual actions in lieu of establishing fire barrier separation for redundant shutdown trains located in the same fire area, the safety conclusions were reached based on plant-specific assessment by the NRC via exemptions or deviation requests.

Statements made by the Nuclear Energy Institute in a meeting with the staff on June 20, 2002, indicate that most licensees have instances where they rely on manual actions in lieu of fire barrier separation for redundant shutdown trains without having obtained exemptions or deviations from the NRC. This presents an unresolved regulatory compliance issue. The staff believes there would likely be substantial resources needed for inspection and follow-up enforcement proceeding associated with this compliance issue if alternative regulatory solutions are not pursued. Identifying and correcting manual action compliance issues on a plant specific basis creates the prospect of significant resource expenditures with uncertain safety benefits. More than likely, licensees faced with enforcement actions would flood the NRC with exemption or deviation requests which would divert NRC attention from more significant safety issues and may not result in any net safety improvement if the manual actions are determined to be acceptable. The staff believes that generic acceptance criteria for the use of manual actions should be developed that would permit licensees to determine the acceptability of the manual actions without the need for NRC review and approval. However, such an approach would require changes to the current regulations and associated guidance.

Safety Significance

Replacing a passive, rated, fire barrier or automatic suppression system with human performance activities can increase risk. For some simple manual actions, the risk increase associated with human performance may be minimal. For other actions, the risk increase could be significant. Risk calculations typically do not assume that a rated fire barrier configuration fails before the fire exceeds test conditions. Human performance typically has some associated failure probability. National Fire Protection Association (NFPA-805) notes that fire risks may be increased where manual operator actions are relied on to provide the primary means of recovery in lieu of fire protection features. Consequently, employing manual actions to maintain functionality of a safe shutdown train during a fire rather than using fire barrier protection may increase the likelihood of the safe shutdown train being unable to fulfill its safety function. However, the overall risk increase appears to be minimal. The staff has previously concluded (on a plant-specific basis) that the use of feasible manual actions for the operation of co-located safe shutdown trains provides an adequate level of fire safety and satisfies the underlying purpose of the fire protection regulations.

What primarily concerns the staff is that some of the unapproved manual actions may not in all cases be feasible. If there are circumstances where the manual actions may not be reasonably accomplished with success, the risk from such manual actions may be significant. The feasibility of the manual actions must be considered in terms of having adequate time, staffing, and environmental conditions needed to support the actions. The difficulty in assessing the acceptability of manual actions in lieu of fire barriers is due to the plant-specific nature and variability of the manual actions.

The following criteria have been used by the staff in its assessment of past exemption and deviation requests involving manual actions.

a. Diagnostic instrumentation utilized in support of manual actions should be demonstrated to be unaffected by the postulated fire and provide a means for the operator to detect whether specific spurious operation had occurred. Some licensees may have protected only those circuits specified in Information Notice 84-09. Additional instrumentation may be needed to properly assess a spurious operation. Annunciators, indicating lights, pressure gages, and flow indicators are among those instruments typically not protected from the effects of a fire. Instrumentation should also be available to verify that the manual action accomplished the intended objective.

b. Environmental conditions encountered by operators while accessing and performing the manual action should be demonstrated to be consistent with established human factor considerations. Radiation levels should not exceed normal 10 CFR Part 20 limits. Emergency lighting should be provided as required in Appendix R, Section III.J or by the licensee's approved fire protection program. Temperature and humidity conditions should be reviewed to ensure that temperature and humidity do not affect the capability to perform the manual action. Fire effects should be reviewed to ensure that smoke and toxic gases from the fire do not affect the capability to perform the manual action.

- Staffing required to perform manual actions should be qualified and demonstrated to be available considering concurrent demands on personnel that may be necessary to achieve and maintain safe shutdown during a fire.

- Adequate communications capability should be demonstrated for manual actions that must be coordinated with other plant operations. Any necessary communications capability should be protected from the effects of a postulated fire.

- Any special tools required to support manual actions should be available at a nearby location that has access unimpeded by a postulated fire. Controls needed to assure dedicated availability of such tools should be demonstrated.

- A training program on the use of manual actions and associated procedures during a postulated fire should be demonstrated to be in effect, current, and adequate.

- Accessibility of all locations where manual operations are performed should be assessed. Manual action locations should be accessible without hazards to personnel. If special equipment is needed (e.g, a ladder), controls to assure availability should be demonstrated.

- An analyses of the postulated fire time-line and the concurrent thermal-hydraulic conditions of the plant should demonstrate that the manual actions can be accomplished before unrecoverable conditions occur.

- Procedural guidance on the use of manual actions should be available, adequate, and contained in an emergency procedure. Operators should not rely on having time to study normal plant procedures to find a method of operating plant equipment that is seldom used.

- Manual actions should be verified and validated by plant walk-downs using the appropriate procedure. The walk-downs should be timed to assure accomplishment within required time frames in support of the plant's safe shutdown analysis. The verification, validation, and walk-down timing should be documented.

The staff believes that acceptance criteria like those above could be used by licensees to generically evaluate the acceptability of unapproved manual actions. The staff could use the above criteria as a starting point for developing objective, non-discretionary criteria to be set forth in a proposed rule. Analysis against the criteria would constitute an acceptable way of demonstrating that the use of manual actions has no adverse impact on the ability to achieve or maintain safe shutdown in accordance with the standard license condition for changes to the fire protection plan. Therefore, licensees could be permitted to demonstrate the feasibility of manual actions in their fire hazards analysis against these criteria without the need for NRC review and approval. With appropriate selection of manual actions and a thorough analysis that demonstrates their feasibility, no appreciable increase in risk should result.

Policy Concerns

The staff has identified two possible policy concerns that may arise in the resolution of this regulatory issue.

The first involves endorsing the practice of using manual actions as an acceptable substitute for fire barrier separation. Up to now, the staff has considered that the use of manual actions should be the exception rather than the rule for protecting the functionality of safe shutdown equipment from fire damage. By endorsing manual actions to resolve this specific compliance issue, the NRC effectively provides that manual actions are as acceptable as physical fire barriers. Licensees may be more likely to rely on manual actions rather than physical fire barrier separation design features for resolving future fire barrier adequacy issues. In addition, permitting manual actions as a regulatory alternative could theoretically result in a licensee not reinstalling fire barrier protection for a safe shutdown train if it were removed for some reason unrelated to the adequacy of the fire barrier (such as a system modification).

The second concern involves the role of Thermo-Lag in generating the current regulatory issue. The staff speculates that a majority of the currently existing manual actions are a result of the Thermo-Lag resolution activities of the 1990s. It appears that many utilities incorporated manual actions into their fire protection program, without NRC staff review and approval, rather than replacing or upgrading the electrical raceway fire barrier system (ERFBS) material. While the staff has found manual actions to be an acceptable alternative to Thermo-Lag upgrades under plant specific conditions, it should be noted that the Commission appears to have intended to resolve the Thermo-Lag issue generically by replacing or upgrading the material as necessary to achieve an acceptable fire barrier resistance—not to employ manual actions as an alternative. This viewpoint is expressed in the testimony of former Commission Chairman Selin before Congress on March 3, 1993. The Chairman stated that "...the NRC's fundamental regulatory requirement, namely 1 hour of protection with detection and suppression or 3 hours without detection or suppression, has not changed. The basic standard has not changed." The Commission may decide that its commitments made before Congress are irrevocable and direct the staff to enforce the existing regulation. However, enforcement to require installation or upgrade of actual fire barrier material in place of manual actions would likely be challenged by the industry as an unnecessary backfit. Furthermore, such actions would be unrealistic considering costs, safety benefits, and the fact that the staff has routinely found manual actions acceptable and safe via exemptions and deviations.

Industry Position

The staff has had extensive interactions and dialogue with the industry on the manual action compliance concerns over the last year including exchanged correspondence, meetings with industry representatives, and a presentation by the staff on the issue at a Nuclear Energy Institute (NEI) fire protection forum. In a letter to the staff dated January 11, 2002, the NEI stated that many licensees use manual actions to achieve safe shutdown to meet Appendix R, Paragraph III.G.2 requirements. Nothing in the NRC regulations specifically prohibits the use of manual actions. NEI also contends that the NRC has implicitly accepted manual actions without exemption or deviation requests for some plants. The industry considers the use of manual actions acceptable, without prior NRC approval, as long as the reliance on manual actions does not adversely affect the ability of the plant to achieve and maintain safe shutdown.

The industry agrees that the licensee should be able to demonstrate that the manual actions can be carried out in the time frame and under the environmental conditions applicable to the actions.

Alternative Considered

Option 1: No regulatory changes—Enforce current requirements

The staff could notify nuclear power plant licensees that using manual actions to operate a safe shutdown train is not permitted as an alternative to providing fire barrier protection from a fire in a location where redundant trains are located unless such changes have specifically received NRC approval. All unapproved manual actions would be considered a violation of Appendix R, Paragraph III.G.2 of 10 CFR Part 50 for pre-1979 plants. Compliance for post-1979 plants would be assessed on a case-by-case basis.

Advantages

1. Upgrading the safe shutdown train fire barrier protection from manual actions to physical barriers would likely result in a net safety improvement over the assumed existing conditions [Improves Safety]
2. Enforcing existing regulations with known non-compliance concerns is a part of the NRC's mission [Maintains Public Confidence]
3. By enforcing the current requirements, there would be no costs associated with developing a new rule and associated guidance documentation

Disadvantages

4. Enforcing the current requirements could significantly increase costs for both the staff and licensees through enforcement actions [Increased Regulatory Burden and Decreased NRC Efficiency and Effectiveness]
5. Because there are numerous examples where the staff has approved the use of manual actions in lieu of fire protections separation barriers for safe shutdown trains, the staff would likely receive a large number of exemption or deviation requests from licensees resulting in significant burden for both licensees and the staff [Increased Regulatory Burden and Decreased NRC Efficiency and Effectiveness]
6. There is reason to believe that the industry would appeal enforcement of the current requirements as a generic backfit. This action by the industry could result in the diversion of significant staff resources. (Note that the Committee for Review of Generic Requirements (CRGR) has reviewed this issue and does not consider enforcement of the existing regulations a backfit) [Decreased NRC Efficiency and Effectiveness]
7. The safety benefit of forcing licensees to upgrade the physical fire barrier separation, where unapproved manual actions are currently utilized, is judged to not be significant when compared to the expected costs and resource diversions discussed in the disadvantages above. In addition, it is likely that most licensees would seek an exemption rather than install compliant fire barrier. Assuming that most exemptions would be approved, no safety benefit would be derived from enforcement [Not Cost Effective]

Option 2: Revise regulatory guidance

The staff considered the possibility that use of manual actions could be interpreted as permissible under the current regulations assuming appropriate analysis and justification has been conducted and documented by the licensee. The staff would issue a regulatory information summary in conjunction with an update of the applicable regulatory guidance and inspection guidance on the use of manual actions.

Although there would be advantages to this approach, the staff has determined that this is not an option based on consultation with OGC. Specifically, OGC has advised the staff that physical fire barriers are the only option allowed by Appendix R, Paragraph III.G.2 and that use of manual actions would require NRC approval for pre-1979 licensees.

Option 3: Revise the existing regulations (rulemaking) and associated guidance

The existing regulations (Appendix R, Paragraph III.G.2) and associated guidance (Branch Technical Position CMEB 9.5-1 or the Standard Review Plan, NUREG-0800) could be revised to explicitly permit the use of manual actions in lieu of using fire barrier separation protection to achieve and maintain safe shutdown in the event of a fire where redundant trains are located. The regulations and associated guidance would include generic acceptance criteria on the use of manual actions. The change would also clarify that the use of manual actions would not require NRC approval provided that compliance with acceptance criteria is documented and demonstrates that the manual actions are feasible and do not adversely affect the ability to achieve or maintain safe shutdown.

Advantages

8. Acceptance criteria would be developed and codified on the use of manual actions as a means of protecting safe shutdown train's functionality during a fire in an area where redundant shutdown trains are located [Maintains Safety]
9. Revising the regulations to permit manual actions would legalize their use and should rectify most associated compliance issues [Maintains NRC Efficiency and Effectiveness]
10. Rulemaking would avoid the need for licensees to prepare exemption or deviation requests and the need for the NRC to process such requests [Reduces Unnecessary Regulatory Burden and Maintains NRC Efficiency and Effectiveness]
11. Avoids backfit issues because licensees that comply with the acceptance criteria for manual actions will not be required to modify their safe shutdown trains to install fire barrier material [Reduces Unnecessary Regulatory Burden and Maintains NRC Efficiency and Effectiveness]

Disadvantages

12. Failure to enforce existing regulations with known compliance concerns would likely impact public confidence [Decreases Public Confidence]

13. Staff resources would need to be expended on rulemaking and associated revisions to regulatory guidance documents
14. Enforcement discretion as described in Option 3 will need to be exercised until rulemaking is completed

Preferred Option

Option 3 is preferred by the staff because rulemaking would be the best regulatory solution to the current compliance issue. Resolving this regulatory issue through rulemaking also provides the most open and direct interface with public stakeholders for developing the criteria that assures that manual actions can be employed safely and without NRC approval. In addition, this option is more likely to avoid the need for processing numerous fire protection related exemption or deviation requests.

Enforcement Considerations

Even with Commission consent to proceed with rulemaking, licensees using unapproved manual actions may not be in compliance until the rulemaking is processed and the regulations and guidance are formally revised. In the interim, rulemaking, by itself, will not avoid potential inspection compliance issues and enforcement proceedings or the related potential of exemption or deviation requests associated with manual actions. To address this potential unnecessary regulatory burden during the interim rulemaking period, the staff would need to adopt conforming enforcement changes, specifically, the staff will also need to propose an interim enforcement policy. If the Commission approves the attached rulemaking plan, the staff intends to develop an interim enforcement policy to exercise discretion and refrain from taking enforcement action for those licensees that rely on unapproved manual actions, provided these licensees have demonstrated and documented feasibility of their manual actions in accordance with preliminary generic acceptance criteria similar to those in the attachment (recognizing that the final acceptance criteria might be modified during the rulemaking process). Although the staff has had numerous interactions with the industry on the manual action compliance concerns over the last year and discussed on a high level what constitutes feasible manual actions, there has not been a focus on the details of manual action criteria. Therefore, should the Commission approve the attached rulemaking plan, the staff would engage stakeholders in at least one public meeting to discuss the detailed manual action feasibility criteria and how it would be used in interim enforcement policy. Shortly after the public meeting, a specific interim enforcement policy would be submitted to the Commission for approval. If the Commission approves the interim enforcement policy, it will be published in the Federal Register together with a Regulatory Information Summary (RIS). The RIS will summarize for the industry and public the expected change in enforcement policy and where the agency is headed with fire protection rulemaking.

Risk-Informed or Performance- Based

The staff's rulemaking recommendation is risk-informed to the extent that it has qualitatively assessed the risk from permitting the use of manual operations to achieve and maintain safe shutdown conditions during a fire. While the staff prefers the use of physical fire barrier separation over manual actions, it has been concluded that any additional risks associated with

manual actions can be minimized if compliance with acceptance criteria for feasible manual actions is demonstrated in the licensee's fire hazard analysis.

The staff's rulemaking recommendation is performance based to the extent that the NRC will not require approval of licensee fire protection programs that employ manual actions provided licensees demonstrate the feasibility of the manual actions in their fire hazards analysis using the acceptance criteria to be specified in the rulemaking. Details of acceptable compliance methods would be provided in updated fire protection regulatory guidance (such as Regulatory Guide 1.189, Fire Protection for Operating Nuclear Power Plants).

Backfit

To resolve an existing regulatory compliance issue, the proposed rulemaking represents a voluntary alternative to the current requirements. The proposed rule would allow the use of manual actions for achieving and maintaining safe shutdown during a fire in an area where redundant shutdown trains are located. Licensees that currently have approved manual actions should not be required to perform any additional actions (such as analysis or documentation). Pre-1979 licensees that employ manual actions but have not received NRC approval are in violation of the current regulations. Inasmuch as the NRC position on use of manual actions under Paragraph III.G.2 has not changed, there is no backfitting as defined in 10 CFR 50.109(a)(1) with respect to pre-1979 licensees who are currently relying upon manual actions to comply with Paragraph III.G.2 and who have not previously received an exemption approving such use. Post-1979 licensees that use manual actions without NRC approval may or may not be in compliance. Compliance for the post-1979 plants depends on the specific licensing commitments, the change control process, and how the change was justified and analyzed to demonstrate that the manual actions are feasible and do not adversely affect the ability to achieve or maintain safe shutdown. For non-compliant post-1979 licensees, the proposed rulemaking would provide another possible option that could be used to restore compliance. Non-compliant licensees would not be required to seek NRC approval if they have documentation that demonstrates acceptability of manual actions in accordance with acceptance criteria (as discussed elsewhere in this plan and to be developed and included in the rulemaking language). While such documentation of manual action acceptability in the fire hazards analysis would represent additional requirements, they are strictly voluntary for non-compliant licensees; non-compliant licensees could elect to comply with the currently specified physical fire barrier separation requirements. Therefore, the staff has concluded that the proposed rule would not constitute a backfit as defined in 10 CFR 50.109(a)(1).

OGC Legal Analysis

The proposed rule would provide current licensees a voluntary alternative of relying upon manual actions under certain circumstances in complying with the fire protection requirements for redundant safe shutdown in Paragraph III.G.2. of 10 CFR Part 50, Appendix R. The proposed rule would set forth the specific circumstances and the proposed criteria for licensee reliance on manual actions. After review of the Atomic Energy Act of 1954, as amended (AEA), OGC concludes that Sections 103, 104, 161, and 182 of the AEA provide the Commission with sufficient authority to promulgate the proposed rulemaking.

OGC understands that the staff is considering a rulemaking approach whereby licensees would be able to implement the voluntary alternative without requesting NRC review and approval. OGC notes that such an approach is possible only if the rule sets forth sufficiently objective, nondiscretionary criteria for the use of manual actions, in order to avoid a challenge to the rule on the basis that the rule is void for vagueness under 5 U.S.C. § 706(2)(A) and/or that it constitutes an unconstitutional delegation of regulatory authority under 5 U.S.C. 706(2)(B) and (C). OGC also notes that any review and approval by the staff which involves substantial discretion and judgment would also require a license amendment under the principles outlined in *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Unit 1), CLI-96-13, 44 NRC 315 (1996).

OGC understands that many licensees' existing fire protection programs are governed or affected by license conditions, orders, or technical specifications. It is possible that these license conditions, orders, or technical specifications might need to be changed in order to implement the voluntary alternative. The rule language must include appropriate language modifying those license conditions, orders, and technical specifications in order to avoid the need for issuance of license amendments modifying and/or superseding those license conditions, orders, and technical specifications. The feasibility of developing such rule language depends upon the language of current fire protection license conditions, orders, and technical specifications. The staff (with the assistance of OGC) should review a representative set of license conditions, orders, and technical specifications in order to assess the feasibility of developing such "self-executing" rule language. In addition, licensees' current final safety analysis reports (FSARs) may include descriptions of the facility with respect to fire protection for redundant safe shutdown. Assuming that the staff is able to develop a "self-executing" rule, the staff should assess whether such FSAR changes are necessary, and consider the need for inclusion of rule language stating that the requirements of 10 CFR 50.59 do not apply (consistent with the provisions of § 50.59(c)(4)).

The staff also proposes that the proposed criteria governing the use of manual actions under Paragraph III.G.2 would not apply to licensees who already have exemptions from Paragraph III.G.2. Special rulemaking language may not be necessary to accomplish this goal if current exemptions are written in a manner which provides a general exemption from III.G.2. The staff (with the assistance of OGC) should review a representative set of exemptions, in order to confirm this.

The proposed rule will require preparation of an environmental assessment, as it appears that no categorical exclusions in 10 CFR § 51.22(c) would apply to this rulemaking.

OGC does not believe that the proposed rule will constitute a backfit as defined in 10 CFR § 50.109(a)(1). This is because the rule would provide a voluntary alternative to nuclear power plant licensees

The proposed rule will require licensees who choose the voluntary alternative to generate and maintain records related to their fire protection programs. If the proposed rulemaking involves record keeping and reporting requirements, review by the Office of Management and Budget for purposes of the Paperwork Reduction Act will be required.

The National Technology Advancement and Transfer Act of 1995 requires consideration of voluntary consensus standards as an alternative to agency-developed standards. The staff must determine whether there are voluntary consensus standards that address the use of manual actions in providing for redundant safe shutdown and whether these standards could be endorsed *in lieu* of a NRC-developed rule.

In conclusion, OGC has determined that there are no known bases for legal objection to the contemplated rulemaking.

Agreement State Compatibility

Under the "Policy Statement of Adequacy and Compatibility of Agreement State Programs" approved by the Commission on June 30, 1997, and published in the *Federal Register* on September 3, 1997 (62 FR 46517), Part 50 is classified as compatibility category "NRC." The NRC program elements in this category are those that relate directly to areas of regulation reserved to the NRC by the Atomic Energy Act or provisions of Title 10 of the Code of Federal Regulations. Therefore, there are no Agreement State implementation issues to address.

Supporting Documents

Preparation of the proposed rule would require the normal supporting documentation, including:

- an environmental assessment
- a clearance package to obtain Office of Management and Budget approval of new information collection requirements
- a regulatory analysis with sufficient information to determine, among other things, whether the regulation will have a significant economic impact on small entities (as required by the Regulatory Flexibility Act)
- a revision to associated regulatory guidance such as Branch Technical Position CMEB 9.5-1, the Standard Review Plan (NUREG-0800), and possibly Regulatory Guide 1.189, "Fire Protection for Operating Nuclear Power Plants"
- revision to fire protection inspection plans and enforcement guidance

Small Business Regulatory Flexibility Act

It is unclear whether the rule is a "major rule" under the Small Business Regulatory Enforcement Fairness Act, inasmuch as insufficient information is available on whether the rule is likely to result in a $100 million impact upon nuclear power plant licensees. If the rule is not a major rule, then the mandated 60-day period prior to effectiveness of major rules is not applicable and the normal 30-day period for effectiveness in the Administrative Procedures Act would apply.

Use of Standards

The National Technology Advancement and Transfer Act of 1995, Public Law 104-113, requires that Federal agencies use technical standards that are developed or adopted by voluntary consensus standards bodies, unless the use of such standards is inconsistent with applicable law or otherwise impractical. The staff notes that separate rulemaking is currently in progress to permit nuclear power plant licensees to develop a risk-informed, performance based fire

protection program consistent with voluntary consensus standard NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants." The staff believes that NFPA 805 could possibly be used to justify the use of fire protection manual actions with appropriate analysis and documentation. However, commitment to implement a revised fire protection program under NFPA 805 may not be a cost-effective way to resolve manual action compliance concerns for some licensees. To adopt the new licensing bases provided by NFPA 805, there would be some attendant costs and analyses that may be prohibitive for some licensees, particularly those near the end of the term of their license. The staff believes that a rulemaking providing the option to use manual actions in accordance with NRC specified criteria is a more practical method to resolve the regulatory issue identified in this rulemaking plan for those licensee that choose to keep their existing licensing basis. The staff is not aware of any other consensus standard that could be adopted instead of NFPA 805 that could be used to provide guidance or criteria on the use of manual actions, but will consider using an alternative standard if identified during the rulemaking process.

Issuance by the Executive Director for Operations or the Commission

Because of the potential policy concerns associated with this rulemaking (the association with Thermo-Lag and the relaxation of fire barrier protection to resolve a compliance issue), the staff recommends that the proposed rule be issued by the Commission.

Key Staff

(i) Working Group

NRR Rulemaking Lead	William Huffman, NRR/DRIP/RPRP
NRR Technical Lead	Phil Qualls, NRR/DSSA/SPLB
NRR Support	Peter Koltay, NRR/DIPM/IIPB
	Laura Dudes, NRR/DIPM
	Eric Weiss, NRR/DSSA/SLPB
	Jim Shapaker, NRR/DRIP/RORP
OE	Renee Pedersen
ADM	Cindy Bladey, ADM/DAS/RDB
OGC Support	Geary Mizuno
Other NRC Offices	None anticipated

(ii) Interoffice Management Steering Group

The staff anticipates only minor interoffice interactions on this rulemaking and has concluded that a steering group is unnecessary.

Public/Industry Participation

The staff anticipates a moderate amount of public interest in this rulemaking. Consequently, the staff plans to have a public meeting on this compliance issue and the staff's resolution process shortly after Commission direction is received on this plan. In addition, the staff will prepare a regulatory information summary (RIS) on the proposed action.

The staff will post this rulemaking plan and any subsequent rule-related information on the NRC's rulemaking Web site if the Commission approves this plan. The staff will also post draft rule language on the Web site as it is developed.

Priority

Because this issue involves a known regulatory compliance concern, the staff is treating its resolution as high priority. However, because of the possible public sensitivity of this issue, the staff does not believe that the proposed rulemaking should be accelerated. To enhance public confidence, the staff intends to process this rulemaking as a normal notice and comment rulemaking, allowing full opportunity for public comment. The resources and schedule to support this high priority rulemaking are discussed below. The treatment of this rulemaking as high priority will not impact the schedule or resources applied to any other NRR rulemakings currently in progress.

Resources

The staff estimates that approximately 3 FTE will be needed to complete this rulemaking, assuming that there is not a significant public reaction to the proposed course of action. Resource usage is estimated at 1.5 FTE in FY03 and 1.5 FTE in FY04. These resources are available in the current budgets for these years. In addition, contract technical assistance may be needed to revise the regulatory guidance in support of the rulemaking and develop the regulatory analysis. It is estimated that these items will cost no more than $50K in FY03 and $50K in FY04. The staff will address the need for any contract funding in its midyear review.

Schedule

- Public meeting on rulemaking plan and interim enforcement policy ..... 1 month after approval of this rulemaking plan
- Submit SECY requesting Commission approval of interim enforcement policy ..... 1 month after public meeting on rulemaking plan and interim enforcement policy
- Issue interim enforcement policy ..... 1 month after Commission approval of interim enforcement policy SECY
- Issue revised inspection guidance ..... Concurrent with issuance of interim enforcement policy
- Issue a regulatory information summary ..... Concurrent with issuance of interim enforcement policy
- Proposed rule to the Commission ..... 1 year after approval of this rulemaking plan
- Public comment period ..... 75 days after publication of proposed rule
- Final rule to the Commission ..... 1 year after the end of the public comment period for the proposed rule