NUREG-1852: "DEMONSTRATING THE FEASIBILITY AND RELIABILITY OF OPERATOR MANUAL ACTIONS IN RESPONSE TO FIRE"

The accompanying table responds *(see italics)* to industry and public comments received from the Federal Registry Notice: Request for public comment on NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire" (ML062350292). The comments are grouped into four categories, all within the accompanying table (see comment column heading): (1) policy-related, (2) technical, (3) editorial, and (4) public.

Industry Submitted Comments transmitted to NRC located in ADAMS (Source):

1. ML070430265 NUREG-1852 COMMENTS, Enclosures 1 & 2; Nuclear Energy Institute (NEI) 1/30/07 Jim Riley
2. ML070290604 NUREG-1852 COMMENTS, Enclosure; Tennessee Valley Authority (TVA)1/23/07 Beth Wetzel
3. ML070430370 NUREG-1852 COMMENTS, Enclosure; BWR Owners Group 2/12/07 R.C. Bunt
4. ML070430269 NUREG-1852 COMMENTS, Nuclear Information and Resource Service (NIRS) 2/12/07 Paul Gunter

#	Source/ Item	NUREG Section	Comment (Related to Policy)
1	BWROG High Level #3	General	What the NRC is asking for is very difficult to do in some cases. The determination of the need to perform a manual operator action in support of post-fire safe shutdown is an analytical artifact resulting from a series of bounding, theoretical, and conservative assumptions related to plant fires, their initial size, their ability to be sustained, their ability to spread without being suppressed and, ultimately, their impact on circuitry in the affected area. The inferred boundary conditions forming the backdrop for many of the requirements of NUREG-1852 are in great contrast to those used for post-fire safe shutdown analysis. When the many theoretical requirements in NUREG-1852 are layered upon the bounding and conservative analytical assumptions already used for the post-fire safe shutdown analysis, the requirements of NUREG-1852 become very difficult to apply. Such requirements include: o The determination of all possible delays for an action (3.2.2, Item 2, bullet 1), determination of all temporary conditions (3.2.2, Item 2, Bullet 3) affecting an operator action o The determination of Alarm Effectiveness (3.2.5: Paragraph starting "Analogous…"), which indicates a determination of the failure rate of the alarm o The determination that a fire will not cause "electrical interference" (4.2.6, bullet 1). Addressing the comments that we provide here, and those provided separately by NEI, will provide guidance will be much more useful.
	Response		*Technical Specifications require procedures. The use of post-fire OMAs is considered a "Procedure for Combating Emergencies and Other Significant Events," per ANSI/ANS-3.2-1982 and should be in accordance with Regulatory Guide 1.33 (1978) and Emergency Operating Procedures (EOPs). In addition, NUREG-1358 informs the nuclear industry of the state of EOPs and reiterates NRC guidance for utility programs to upgrade EOPs. Supplement 1 of NUREG-1358, Appendix B, provides direct guidance on these types of determinations and the Verification and Validation process that should be conducted. NUREG-1852 is based on prior guidance from the NRC as applied through the Reactor Oversight Program in Inspection Procedure 42001, "Emergency Operating Procedures."* *The information in NUREG-1852 is for NRC staff determination of the feasibility and reliability of post-fire OMAs when used, for example in lieu of the current requirements in Paragraph III.G.2 (i.e., via an exemption) and future staff licensing actions reviewing post fire safe shutdown. To ensure the level of capability to achieve safe shutdown provided by the passive separation or distance and barrier requirements of III.G.2 is not compromised, there should be assurance of the feasibility and reliability of OMAs ,including addressing uncertainties associated with those actions to maintain an adequate safe shutdown capability. The NUREG, particularly in Sections 4.2.1 and 4.2.2 , provides flexibility with regard to considering the treatment of uncertainties for post-fire OMAs. As to the specific uncertainties mentioned in the comment, refer to the specific comments and responses covering the referenced sections mentioned in the comment. Note that some additional clarifications have been included in the NUREG in response to those specific comments.* *In the end, the uncertainties genuinely exist (they are not just analytical artifacts). Given a deterministic rule where the individual actions cannot be ranked as to their risk importance, the rule must be able to cover all actions that may be needed. Thus, in all cases, these uncertainties should be addressed to show the actions are feasible and reliable. There are always other options, e.g., meeting the standard III.G.2 criteria or transitioning to NFPA 805, as discussed in RIS 2006-10, "Regulatory Expectations with Appendix R, III.G.2 Operator Manual Actions."*

#	Source/ Item	NUREG Section	Comment (Related to Policy)
2	NEI Cover Letter Key area 1 and #1 *Response*	General	The need to perform a operator manual action is based on a series of bounding assumptions that provide for defense-in-depth (DID). These DID provisions are related to plant fires, their initial size, their ability to be sustained, their ability to spread without being suppressed and, ultimately, their impact on circuitry in the affected area. The vast majority of these bounding analytical assumptions are quite conservative. The set of boundary conditions in a post-fire safe shutdown analysis is significantly different from the inferred boundary conditions behind many of the requirements of NUREG-1852. Many of the requirements in NUREG-1852 are theoretical in nature. When these theoretical assumptions are layered upon the DID provisions already used for the post-fire safe shutdown analysis, the requirements of NUREG-1852 become very difficult to apply. *Existing fire protection regulations rely on passive fire protection through fire barriers that, when operable, have a high level of reliability to prevent the spread of fire and hot gases from being transported into adjacent areas or damaging adjacent systems, structures and components. When licensees choose to rely on operator manual actions (OMAs) which are typically less reliable than passive features to demonstrate adequate safety, those OMAs should be feasible and reliable. Unless there is a demonstration of the level of protection and appropriate evaluation of OMAs accounting for the real uncertainties that exist in performing such actions under different fire conditions, the staff cannot ensure that adequate fire safety is maintained.*
3	BWROG High Level #2 *Response*	General	What the NRC is asking for is not justified by the risk avoided. The requirements applied by this NUREG do not consider the fact that there is a high degree of defense-in-depth inherent in current fire protection and safe shutdown requirements. These defense-in-depth measures (including fire prevention, mitigation through automatic and manual suppression, and safe shutdown measures) offer a high degree of risk reduction. All operator manual actions should be demonstrated as feasible, but the imposition of excessively conservative requirements does not significantly improve the risk reduction provided by these actions. *Current deterministic fire protection relies on defense in depth including passive fire protection through fire barriers that, when operable, have a high level of reliability to prevent the spread of fire and hot gases from being transported into adjacent areas or damaging adjacent systems, structures and components. OMAs do not constitute a defined level of defense in depth. OMAs were used to achieve shutdown during the Browns Ferry fire which resulted in the development of defined defense in depth. In addition, OMAs are typically less reliable than passive features to demonstrate adequate safety, thus OMAs should be feasible and reliable. Unless there is a demonstration of the level of protection and appropriate evaluation of OMAs accounting for the real uncertainties that exist in performing such actions under different fire conditions, the staff cannot ensure that adequate fire safety is maintained.*

#	Source/ Item	NUREG Section	Comment (Related to Policy)
4	TVA #1	General	Distributed throughout the document are references to conservatisms that could substantially influence the allowed time for operator actions. Examples are: (1) There are recognized differences in how plants utilizing diagnostic procedures and plants utilizing pre-emptive procedures approach Fire Safe Shutdown (FSSD); and (2) There are references that would allow fire modeling to extend time considerations (full automatic detection/suppression and professional fire departments vs. part-time fire brigades; etc.). There should be a summation in the main body that would identify areas in which "special" defense-in-depth considerations, that obviously exceed minimum requirements, are identified and discussed, including credit that might offset imposition of such things as time margins and reliability issues.
	Response		*It is not the purpose of the NUREG to address all the defense-in-depth features that go into considering the adequacy of post-fire response (this is more the subject of RIS 2006-10, "Regulatory Expectations with Appendix R, III.G.2 Operator Manual Actions"). For instance, fire suppression approaches and features are not the subject of the NUREG. The NUREG is for NRC staff determination of the feasibility and reliability of post-fire OMAs when used for example for post fire safe shutdown or in lieu of the current requirements in Paragraph III.G.2 (i.e., via an exemption). To ensure that the level of protection necessary to achieve post fire safe shutdown is not significantly compromised, there should be assurance of the feasibility and reliability of OMAs, including addressing uncertainties associated with those actions.* *Sections 4.2.1 and 4.2.2, in particular, provide information as to the flexibility that exists to consider or otherwise treat uncertainties associated with the performance of OMAs. This flexibility was purposely provided when a single "objective" time margin was objected to by the industry. For instance, one could perform a best-estimate analysis for the time allowed and perform demonstrations of executing the action(s) under somewhat ideal considerations, and then include additional time (time margin), with justification, to account for the uncertainties discussed in those sections before comparing the time allowed vs. the time to execute the action(s). Another approach might be to perform a very conservative non-mechanistic assessment of the time allowed (i.e., yielding a much shorter time than if a best-estimate realistic time were to be calculated based on fire modeling) with justification as to how the assessment encompasses many, if not all, the uncertainties; and/or use demonstrations of the action(s) that nearly duplicate actual fire conditions and include consideration of the uncertainties so as to provide a reasonably enveloping time for the execution time. In this latter case, it may then be possible to justify that the very conservative assessment of the time allowed, by itself, or particularly in combination with more realistic demonstrations, together, accounts for the uncertainties so that little or no extra time (time margin) should be further included. Other options could exist.* *How to specifically proceed is likely to depend on such issues as what time-related calculations already exist, the ease (or not) of making the demonstration close to actual fire conditions, whether the action is a preventive or reactive type action and how soon the action needs to be performed, among others. The information provided in NUREG-1852 should be generally applicable for all actions under all types of circumstances and should be applied in ways that make sense to the specific action and circumstance. Using this information to the extent appropriate, NRC staff can review an OMA to provide assurance of the achievement of post fire safe shutdown.*

#	Source/ Item	NUREG Section	Comment (Related to Policy)
5	TVA #2	Appendix and B	The inclusion of a time margin factor appears to be based solely on FSSD considerations. The defense-in-depth design philosophy utilized in all Fire Protection Programs is based on a three echelon program, of which the FSSD element is only one. Existing regulations (i.e., BTP 9.5.1, NUREG 0800, RG 1.189, etc.) indicate that each echelon should "meet certain minimum requirements." The existing regulations further state that strengthening one "can compensate in some measure for weaknesses, either known or unknown, in others." The methodology for determining an appropriate time margin factor should be further defined to account for the wide variations in existing programs for both the Administrative and the Detection/Suppression echelons of defense-in-depth.
	Response		*Existing fire protection regulations rely on passive fire protection through fire barriers that, when operable, have a high level of reliability to prevent the spread of fire and hot gases from being transported into adjacent areas or damaging adjacent systems, structures and components. When licensees choose to rely on OMAs which are typically less reliable than passive features to demonstrate adequate safety, those OMAs should be feasible and reliable. Unless there is a demonstration of the level of protection and appropriate evaluation of OMAs accounting for the real uncertainties that exist in performing such actions under different fire conditions, the staff cannot ensure that adequate fire safety is maintained.*

#	Source/ Item	NUREG Section	Comment (Related to Policy)
6	NEI Cover Letter 1st paragraph *Response*	General	In general, the nuclear industry considers this NUREG to be a restatement of the requirements previously included in the Rulemaking on Operator Manual Actions. Since the Rulemaking and its associated Draft Regulatory Guide (DG-1136) were withdrawn, the industry believes that the concepts associated with the Rulemaking should not be imposed on the industry by a mechanism with less stature than the rule itself. Industry believes that the effect of this NUREG will be to establish expectations for the treatment of operator manual actions and a NUREG is not the appropriate regulatory communication to use for this purpose. The industry also believes the resolution of the issues surrounding the use of operator manual actions in support of post-fire safe-shutdown must be addressed in conjunction with the resolution of the fire induced circuit failures issue. Both of these issues are integral parts of the methodology for performing a post-fire safe-shutdown analysis and, as such, they need to be addressed together. *In 2002 the staff developed a rulemaking plan and presented the plan to the NRC Executive Team. The plan would revise 10 CFR Part 50, Appendix R, Section III.G.2, to allow feasible and reliable OMAs. On June 17, 2003, the staff provided SECY 03-0100 to the Commission outlining the rulemaking plan. The Commission approved the plan via a staff requirements memorandum (SRM) dated September 12, 2003. On December 22, 2004, the staff provided SECY 04-0233 to the Commission, detailing the proposed rule and recommending its publication for public comments. The proposed rule would have provided an option for a licensee to use feasible and reliable OMAs in lieu of the fire barrier or separation requirements stated in Section III.G.2. The Commission agreed with the staff position that III.G.2 protection should rely on passive features provided in III.G.2 and approved the staff's recommendations via an SRM dated January 18, 2005, including continued use of the enforcement discretion policy described in Enforcement Guidance Memorandum (EGM) 98-02.* *As part of the withdrawal of the rulemaking, the staff initiated a closure plan consisting of several integrated efforts to ensure continued compliance with the fire protection regulations. The elements of the closure plan are to (1) continue with scheduled fire protection inspections to verify compliance with fire protection regulations; (2) issue a RIS that reiterates compliance expectations with respect to the use of OMAs, discusses means to achieve compliance, advises licensees of the date the staff will terminate the enforcement discretion guidance in EGM 98-02 and discusses the new enforcement discretion, potential exemption requests, compensatory measures and corrective actions pertaining to OMAs; (3) update Section 9.5.1, "Fire Protection Program," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," to address post-fire OMA acceptance guidance and enhance our regulatory review process for future licensing actions, such as exemption requests [this is handled in RG 1.189]; and (4) continue to engage external stakeholders as necessary to ensure the staff's plans and expectations are clear.* *NUREG-1852 is an element of this closure process. It includes criteria similar to those proposed in the original rule change because these criteria remain valid as a means to assure the feasibility and reliability of manual actions. It is written so as to provide information concerning each criterion, the technical bases that support the need for each criterion (in Section 3) and recommendation on the implementation of each criterion (in Section 4). It allows industry the flexibility as to how the criteria may be implemented (especially since a single "objective" time margin was objected to by the industry) but, at the same time, provides for an assessment of the acceptability of OMAs since these actions are intended to be used in lieu of other codified regulations. This includes such provisions as performing best-estimate analyses with specific treatment of the uncertainties to be addressed, or performing very conservative assessments with justification that the uncertainties are enveloped by such assessments. OMA feasibility and reliability then depend on how conservative (or not) the timing assessments are, as balanced against how realistic (or not) the demonstrations are (i.e., what uncertainties are left untreated by the demonstrations). The more uncertainties are not captured by the nature of the assessment or the demonstrations, the more "time margin" has to be added to cover the uncertainties. The more the assessments and/or the demonstrations can be justified as enveloping the uncertainties, the less time margin has to be included.*

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7	NEI Cover Letter Key area 2 and #2 *Response*	General	Consideration should be given to allow the necessary time for licensees to properly address future guidance on fire induced circuit failures and the use of operator manual actions once they become final. The Commission directed the Staff to work with the industry to resolve these issues in the SRM for SECY-06-0196. Industry believes that the Commissioners' comments in SECY-06-0196 SRM are also applicable to this issue. Proliferation of multiple guidance documents and inspection criteria before a viable technical solution is reached on the issues will only serve to de-stabilize the regulatory process and reduce stakeholder confidence. In order to allow time for resolution of these issues and to provide interim guidance for addressing non-compliances, the NRC should reinstitute Enforcement Discretion and Inspection Criteria for circuit analysis and operator manual actions similar to NRC Enforcement Guidance Memorandum (EGM) 98-002, "Disposition of Violations of Appendix R, Sections III.G and III.L Regarding Circuit Failures", March 2, 1998 and February 2, 2000, Revision 2 (ML003710123). *NUREG-1852 provides criteria and associated technical bases to demonstrate the feasibility and reliability of OMAs. OMAs implemented in lieu of compliance with III.G.2 require an exemption from the regulation. OMAs implemented as a compensatory measure should meet the criteria of Inspection Procedure (IP) 71111.05T. Manual actions that fail to meet the criteria in the inspection procedure are not considered to be feasible or adequate compensatory measures. OMAs used as compensatory measures should also be appropriate and within the Enforcement Discretion period published in Federal Register Notice dated April 18, 2006, 71 FR 11169 (FR / Vol. 71, No.74 / 19905).* *Circuit analyses, in part, may show there is a need to implement an OMA. In this way, the two topics are related. However, once it is determined such an action is desirable, the feasibility and reliability of the resulting action should be assured. NUREG-1852 provides information on considerations applicable to providing that assurance.*
8	NEI Cover Letter Key area 4 and #4 *Response*	General	The NUREG appears to mix performance-based concepts into a deterministic regulatory framework. Based on recent regulatory interpretations and guidance, many types of operator manual actions may be 'allowed' without requiring the need for exemptions or license amendment requests. However, the methodologies in this NUREG introduce many performance-based concepts such as estimating fire damage time, detector response time, etc. This insinuates that estimating fire damage (e.g., using fire modeling) is an acceptable approach for determining operator manual actions under a deterministic regulatory basis. However, the approach outlined in NUREG-1852 is inconsistent with the traditional approach endorsed by the NRC and used by the industry for demonstrating compliance under the deterministic post-fire safe shutdown requirements. As such, the guidance of NUREG-1852 represents a major change in the requirements related to achieving compliance under the deterministic post-fire safe shutdown requirements. *The primary intent of this NUREG is to facilitate NRC staff review of future exemptions or license amendment requests for OMAs. NUREG-1852 provides one coherent set of deterministic feasibility and reliability criteria, which enables the NRC staff to perform consistent reviews. NRC has no current plans to incorporate this NUREG into inspection guidance. Inspectors may choose to become familiar with and expand their knowledge of feasibility and reliability criteria for OMAs through the NUREG. The NUREG does not change any regulatory requirements. It does, however, enable the NRC staff to ensure consistent reviews of expected exemption requests and to ensure that an adequate safety margin is maintained.*

#	Source/ Item	NUREG Section	Comment (Related to Policy)
9	NEI Cover Letter Key area 5 and #5 *Response*	General (referring to 11/29/06 public meeting)	The NRC presentation at the November 29, 2006 public meeting (ADAMS ML063390044) provided several examples that imply that the use of operator manual actions require detection and automatic suppression to maintain defense-in-depth. These references to detection and suppression in this NUREG are inappropriate and use the wrong process to establish regulatory expectations. Also at this same presentation, the NRC indicated (ADAMS ML063390044) that they would backfit NUREG-1852 criteria onto existing actions thru inspection process, including: • Actions for licensee's previously-approved Alternative Shutdown capability; • Actions previously approved by exemptions; • Actions previously approved by some other mechanism (ex., approved by initial licensing for Post-1979 plants). Unless a licensee has specifically committed to the NUREG, the use of the NUREG in the inspection process is a backfit. *The primary intent of this NUREG is to facilitate NRC staff review of future exemptions or license amendment requests for OMAs. NUREG-1852 provides one coherent set of deterministic feasibility and reliability criteria, which enables the NRC staff to perform consistent reviews. NRC has no current plans to incorporate this NUREG into inspection guidance. Inspectors may choose to become familiar with and expand their knowledge of feasibility and reliability criteria for OMAs through the NUREG. The NUREG does not change any regulatory requirements. It does, however, enable the NRC staff to ensure consistent reviews of expected exemption requests and to ensure that an adequate safety margin is maintained.*
10	NEI Cover Letter and #6 *Response*	General	Based on the above key areas of concern, and the detailed comments of Enclosure 1, it is recommended that NUREG-1852 (FRN: fr12oc06-92) and other related guidance, inspection criteria, and regulatory documents be placed on hold until the base issues related to fire induced circuit failures and operator manual actions **are resolved.** *NUREG-1852 provides criteria and associated technical bases to demonstrate the feasibility and reliability of OMAs. OMAs implemented in lieu of compliance with III.G.2 require an exemption from the regulation. OMAs implemented as a compensatory measure should meet the criteria of Inspection Procedure (IP) 71111.05T. Manual actions that fail to meet the criteria in the inspection procedure are not considered to be feasible or adequate compensatory measures. OMAs used as compensatory measures should also be appropriate and within the Enforcement Discretion period published in Federal Register Notice dated April 18, 2006, 71 FR 11169 (FR / Vol. 71, No.74 / 19905).* *Circuit analyses, in part, may show there is a need to implement an OMA. In this way, the two topics are related. However, once it is determined such an action is desirable, the feasibility and reliability of the resulting action should be assured. NUREG-1852 provides information on considerations applicable to providing that assurance.*

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11	NEI Cover Letter	General	In addition to the comments in this letter, the industry has identified concerns with respect to operator manual actions in several other instances. On July 17, 2006, NEI wrote a letter to Dr. Sunil Weerakkody related to the conflicts between Generic Letter 81-12 and recent documents such as RIS 2006-010 and RIS 2005-030. Additional conflicts between recent NRC guidance and past NRC practice are also discussed in Licensee comments on the original Operator Manual Action Rulemaking, such as ML051440468. The comments included in these letters should also be resolved prior to issuing NUREG-1852.
	Response		*NUREG-1852 provides criteria and associated technical bases to demonstrate the feasibility and reliability of OMAs. OMAs implemented in lieu of compliance with III.G.2 require an exemption from the regulation. OMAs implemented as a compensatory measure should meet the criteria of Inspection Procedure (IP) 71111.05T. Manual actions that fail to meet the criteria in the inspection procedure are not considered to be feasible or adequate compensatory measures. OMAs used as compensatory measures should also be appropriate and within the Enforcement Discretion period published in Federal Register Notice dated April 18, 2006, 71 FR 11169 (FR / Vol. 71, No.74 / 19905).* *Circuit analyses, in part, may show there is a need to implement an OMA. In this way, the two topics are related. However, once it is determined such an action is desirable, the feasibility and reliability of the resulting action should be assured. NUREG-1852 provides information on considerations applicable to providing that assurance.*

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12	NEI #7	General	The document is excessive in length providing lengthy, repetitive dialogue with many considerations and few proposed criteria. The guide shares similarity with the types of documents that would be considered in the analysis of a single operator manual action in an SDP, but not a practical document for a plant to analyze and group numerous operator manual actions relied upon as a foundation of the fire protection program (which is not uncommon in the industry). It appears to be geared towards the very detailed analysis of a single action with extreme rigor. This is somewhat separated from the actual situations in place at a number of facilities. Recommend the document be condensed to provide a simplified guidance outline for performing the feasibility analysis.
	Response		*In 2002 the staff developed a rulemaking plan and presented the plan to the NRC Executive Team. The plan would revise 10 CFR Part 50, Appendix R, Section III.G.2, to allow feasible and reliable OMAs. On June 17, 2003, the staff provided SECY 03-0100 to the Commission outlining the rulemaking plan. The Commission approved the plan via a staff requirements memorandum (SRM) dated September 12, 2003. On December 22, 2004, the staff provided SECY 04-0233 to the Commission, detailing the proposed rule and recommending its publication for public comments. The proposed rule would have provided an option for a licensee to use feasible and reliable OMAs in lieu of the fire barrier or separation requirements stated in Section III.G.2. The Commission agreed with the staff position that III.G.2 protection should rely on passive features provided in III.G.2 and approved the staff's recommendations via an SRM dated January 18, 2005, including continued use of the enforcement discretion policy described in Enforcement Guidance Memorandum (EGM) 98-02.* *As part of the withdrawal of the rulemaking, the staff initiated a closure plan consisting of several integrated efforts to ensure continued compliance with the fire protection regulations. The elements of the closure plan are to (1) continue with scheduled fire protection inspections to verify compliance with fire protection regulations; (2) issue a RIS that reiterates compliance expectations with respect to the use of OMAs, discusses means to achieve compliance, advises licensees of the date the staff will terminate the enforcement discretion guidance in EGM 98-02 and discusses the new enforcement discretion, potential exemption requests, compensatory measures and corrective actions pertaining to OMAs; (3) update Section 9.5.1, "Fire Protection Program," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," to address post-fire OMA acceptance guidance and enhance our regulatory review process for future licensing actions, such as exemption requests [this is handled in RG 1.189]; and (4) continue to engage external stakeholders as necessary to ensure the staff's plans and expectations are clear.* *NUREG-1852 is an element of this closure process. It includes criteria similar to those proposed in the original rule change because these criteria remain valid as a means to assure the feasibility and reliability of manual actions. It is written so as to provide information concerning each criterion, the technical bases that support the need for each criterion (in Section 3) and recommendation on the implementation of each criterion (in Section 4). It allows industry the flexibility as to how the criteria may be implemented (especially since a single "objective" time margin was objected to by the industry) but, at the same time, provides for an assessment of the acceptability of OMAs since these actions are intended to be used in lieu of other codified regulations. This includes such provisions as performing best-estimate analyses with specific treatment of the uncertainties to be addressed, or performing very conservative assessments with justification that the uncertainties are enveloped by such assessments. OMA feasibility and reliability then depend on how conservative (or not) the timing assessments are, as balanced against how realistic (or not) the demonstrations are (i.e., what uncertainties are left untreated by the demonstrations). The more uncertainties are not captured by the nature of the assessment or the demonstrations, the more "time margin" has to be added to cover the uncertainties. The more the assessments and/or the demonstrations can be justified as enveloping the uncertainties, the less time margin has to be included.*

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13	TVA #4	General	The imposition of reliability criteria appears to represent an approach which mixes deterministic criteria with risk criteria. In the past, the staff has indicated that plants should not utilize both deterministic and risk elements in a single program. If plants are now allowed to utilize specific risk insights to offset weaknesses in specific elements of a deterministic program, additional examples of areas where this is acceptable should be provided (similar to the guidance in Section 3.2.2 for Reliability associated with manual operator actions). For example, could an area with low ignition frequency, limited in situ combustibles, no major fire hazards, and detection/suppression be considered "low-risk" to the point that separation requirements could be relaxed? If not, what is the basis for applying "risk" criteria to one aspect (i.e., manual operator actions) while excluding it in others.
	Response		*NUREG-1852 provides a performance-based deterministic approach for NRC staff to evaluate the reliability and feasibility of manual actions submitted as exemption requests. There is no discussion of risk within the document. The NUREG does not impose quantitative reliability criteria but qualitative criteria that can be used to demonstrate and ensure feasibility and reliability of the OMAs . If a licensee chooses to apply risk concepts selectively, then they should meet the applicable quality standards or, for instance, use another approach such as transitioning to NFPA 805 so that the different risks associated with each action can be taken into account (see RIS 2006-10).*
14	BWROG	General	In some cases NUREG-1852 seems to be providing new staff positions NUREG-1852's reference to Reg Guide 1.33 Appendix A specifically requiring post-fire safe shutdown procedures appears to represent a new staff position, as it is inconsistent with Generic Letter 86-10, staff position 5.2.3. Previously, RG 1.33 Appendix A item 6.v had generally been interpreted as applying to the Fire Fighting/Brigade activities. Considering the previous staff position provided in GL 86-10 position 5.2.3, it is clear that NUREG-1852 is re-interpreting RG.1.33.
	Response		*The staff does not agree with the comment. Although GL 86-10 does state that procedures are required for alternate shutdown, the requirement is for one other train to be free from fire damage. If the regulations were met, control room procedures would be adequate and no OMA required on the non-fire affected train, due to one of the redundant safe shutdown trains having been protected from fire damage. Procedures are required for activities greater than skill of the craft by RG 1.33. This would include OMAs required to shut down a nuclear power plant.*
15	NEI #16	General	NUREG-1852's reference to Reg Guide 1.33 Appendix A specifically requiring post-fire safe shutdown procedures appears to represent a new staff position, as it is inconsistent with Generic Letter 86-10, staff position 5.2.3. Previously, RG 1.33 Appendix A item 6.v had generally been interpreted as applying to the Fire Fighting/Brigade activities. Considering the previous staff position provided in GL 86-10 position 5.2.3, it is clear that NUREG-1852 is re-interpreting RG.1.33.
	Response		*GL 86-10, position 5.2.3, addresses the use of procedures for alternative shutdown (III.G.3). When GL 86-10 was written, the NRC expected licensees to be in compliance with the separation requirements of III.G.2 that rely on passive features. Therefore, the staff concludes that criteria in NUREG-1852 are consistent with NRC guidance and or requirements. The NRC requires plants to have procedures to achieve safe shutdown. RG 1.33 and ANSI/ANS 3.2-1982, Section 5.3.9, "Emergency Procedures / Procedures for Combating Emergencies and Other Significant Events," give guidance to the time margin and the feasibility and reliability of OMAs. NUREG -1358 informs the nuclear industry of the expectations and reiterates NRC expectations for utility programs to upgrade their EOPs.* *The Regulatory Guide 1.33 (Rev.2) Quality Assurance Program Requirements were issued in 1978, and the ANSI/ANS-3.2-1982 standard reiterates the technical basis for the need for a post-fire safe shutdown procedure. In Generic Letter 86-10, there is no specific mention of a post-fire safe shutdown procedure for fire brigade activities; however, Section 5.2.3 specifically is identified for areas where Alternate Shutdown Capability is necessary. Fire Brigade activities are not addressed in GL 86-10.*

#	Source/ Item	NUREG Section	Comment (Technical)
16	NEI #8 *Response*	General	There are numerous challenges with implementing this guidance. The application of the guidance content is not clear and suggests a large amount of work is required to demonstrate acceptance of the use of operator manual actions. It appears the demonstration of feasibility and reliability is far greater for manual actions following a fire than for other design basis events. *NUREG-1852 provides criteria and associated technical bases to demonstrate the feasibility and reliability of OMAs. The regulations require one train free of fire damage. The use of a manual action in lieu of the separation or distance requirement in III.G.2 means that the manual action must be successful because both trains may be damaged from a single fire. Therefore, the manual actions should be feasible and reliable to achieve safe shutdown (SSD).*
17	BWROG High Level #1 *Response*	General	The NRC is asking for more than is required for design basis events and EOPs. Many of the requirements exceed what is required for operator actions for design basis actions. These include requirements for a diagnosis for a failed recovery action (3.2.5, first paragraph and others), determination of crew differences (4.2.2, item b), and others. *If an OMA is credited for post fire SSD, then it is assumed that the manual action is required to achieve and maintain SSD. The licensee may be using operator manual actions (OMAs) in lieu of physical separation barriers that provide defense-in-depth, with the specific objective of achieving hot shutdown and maintaining the plant in that mode. The OMAs may be performed during a design basis event ,or they may be taken during a beyond-design basis event. The rigor which is needed to assure that the OMAs are capable of being performed in a manner sufficient to maintain a level of defense-in-depth comparable to that provided by the physical separation requirements is independent of the event or whether it is provided by steps in an EOP or another plant procedure. When EOPs are invoked, there is generally no plant damage; control room actions are largely utilized. This is not true in post fire SSD compliance where OMAs in lieu of separation or alternative SSD are postulated. NUREG-1852 provides one set of criteria for determining feasibility and reliability of OMAs that can provide reasonable assurance that OMAs along with other fire protection program elements will maintain a level of defense-in-depth comparable to that provided by the physical separation requirements and satisfy the explicit purpose of bringing the plant to hot shutdown. The NUREG is not a requirements document but is meant to assist NRC staff in assessing the feasibility and reliability of OMAs. The items cited in the comment are meant to illustrate the types of considerations that may impact the feasibility and reliability of an OMA and so, to the extent appropriate, may impact the acceptability of that OMA for a given fire. To emphasize this, changes have been made throughout Sections 3 and 4 of the NUREG, where most appropriate, to reflect that the guidance is to be applied to the extent it is appropriate, recognizing that specific manual actions may need to align with the criteria to varying degrees; i.e., not all of the factors that can influence performance will be relevant for all situations. Additionally, throughout we have replaced any terminology indicating requirements with terminology consistent with technical review (e.g.,"should" or "consider") that could be useful to NRC staff and to licensees using such an approach to demonstrate feasibility and reliability.*

#	Source/ Item	NUREG Section	Comment (Technical)
18	BWROG	Section 3	3.2.5, First Paragraph: Diagnosis is needed in order to identify an action is needed. Item 3 refers to indication to recover a failed action, which is not typically considered part of the diagnosis phase of an action. This diagnosis may need to be provided, but only if the confirmation of the action is needed to continue performance of a procedure or performance of additional actions. Additionally, unless the action is considered highly un-reliable, the indication that the recovery action has failed should not affect the overall reliability of the action. Finally, the availability of indication of a failed procedural step is only needed if credit will be taken in the probability calculation for the failure to perform the action, which is not a concern for a deterministic approach as provided in NUREG-1852. NRC should remove item 3 from the diagnosis requirements.
	Response		*In Sections 3 and 4 of the NUREG, the staff has gone through each criterion and added/changed text, where most appropriate, to reflect that the information is to be applied to the extent it is appropriate. Reviewers should recognize that specific manual actions may need to align with the criteria to varying degrees, depending on the nature of the action and the factors that could be relevant given the fire scenario. For example, preventive actions may only depend on the fire alarm/location indication. Feedback indication of successful performance of an action clearly is dependent on the action. For instance, pulling out a breaker drawer to remove power to a device is directly observable and would need no other indication. We have similarly clarified our intent regarding feedback indication in Sections 3.2.5 and 4.2.5. Verifying that the credited manual actions are accomplished is important because these actions can be different in nature and are being credited "in place of" physical separation provisions. These actions should be verified as capable of being performed, along with other fire protection program elements, in a manner sufficient to maintain a level of defense-in-depth comparable to that provided by the physical separation criteria.*
19	BWROG	Section 3	3.2.11, Paragraph starting "For this Criterion, …" This paragraph requires the demonstrations for operator manual actions to be performed under simulated fire conditions. There is no requirement for this, nor is there a similar requirement for operator actions performed for Design Basis Events. This requirement should be removed. The basis provided refers to fire brigade drills, however this section also shows a mis-interpretation of requirements for fire brigade drills. Brigade drills conducted in the plant are "strenuous", however they do not "simulate actual fire conditions" as NUREG-1852 implies. Brigades experience "actual fire conditions" during controlled training evolutions at separate live burn facilities, not in the plant.
	Response		*This is not a requirement but is for NRC staff use to evaluate future exemptions or license amendment requests for specific manual actions taken in lieu of fire barriers. Simulated fire conditions may be "modeled" to the extent reasonable during the demonstrations, and credit for conducting more realistic demonstrations may be included as a reduction in the time margin (representing a decrease in some of the uncertainty with regard to human performance and fire effects variabilities during the performance of OMAs under actual fire scenarios). In effect, the "more realistic" the demonstration(s), the less the uncertainty that could impact the time margin. It is up to the analyst to show how this tradeoff is applied. This intended balance between the realism of the demonstration and the uncertainty in justifying that there is adequate time has been incorporated in text changes made to sections 3.2.11 and 4.2.11.*

#	Source/ Item	NUREG Section	Comment (Technical)
20	BWROG	Section 4	4.2.11: General: The imposition of these random impediments is also inconsistent with previous NRC guidance for performing safe shutdown analyses, as stated above. The requirements within this section should be verified to be consistent with other operator actions in the emergency operating procedures at a plant. It appears that the specific requirements listed are over and above those required in response to already required operator actions, such as local actions following a LOCA, Loss of Offsite Power, etc. For example, requiring noise level to be simulated, requiring hand-wheels that may be stiff to be included in the simulation, etc. are over and above the long standing requirements for demonstrating EOP actions. The requirements listed should be reviewed by NRC and Industry operations and training experts to determine where the requirements go beyond the existing requirements, and to determine if this extension makes sense for fire actions only.
	Response		*This is not a requirement but is for NRC staff use to evaluate future exemptions or licensing amendment requests for specific manual actions taken in lieu of fire barriers. These "random impediments" are provided as "examples," as stated in the NUREG, of uncertainties that could lengthen the time required to perform a manual action under actual fire conditions, as opposed to demonstrating the action using, for instance, ideal (best) conditions. In Section 4.2.2, it is stated: "Note that as before, there are at least two ways to account for these additional uncertainties associated with the time required for the manual action. One is to have purposely arrived at a conservative estimate of the time needed to diagnose the need for and implement the manual action (but based generally on the measured demonstration time) with a justification that the additional uncertainties listed below are enveloped by the conservative estimate. Another is to specifically account for the additional uncertainties listed below." In practice, the latter option would likely involve going into more detail regarding how much time the various uncertainties might add, and then showing that the resulting total time to accomplish the action clearly fits within the estimates of the total time available.* *Failure to consider these uncertainties may weaken the "realism" of the demonstration, inevitably leading to greater uncertainty that would be addressed by an increase in time-margin. To ensure consistency with how one might handle such uncertainties as expressed in Section 4.2.2, changes have been made to Section 4.2.11 to express the desirability of considering these types of uncertainties as part of the demonstration in order to justify that there is adequate time to perform the OMA. Otherwise, these types of uncertainties should be part of ensuring that there is adequate margin between the time allowed and the time it might take to perform the OMA. The Demonstration (feasibility) and Time Margin (reliability), at least as defined in this NUREG, are closely related; one should not "skimp" on one without having to enhance the other. (Also see related response to "BWROG, Section 3" on Section 3.2.11 [Table Comment #19].)*

#	Source/ Item	NUREG Section	Comment (Technical)
21	NEI #37	4.2.2(b), p. 4-5	Evaluating the "expected variability among individuals and crews" per section 4.2.2 (b) of NUREG-1852 exceeds the analysis normally conducted within the scope of HEP (human error probability) development. In addition, the NRC licensing process ensures that nuclear power plant operators meet competency standards under all expected accident conditions. NRC Form 396, assessed per ANSI standards, attests to an applicant's physical and mental fitness for licensure as a NPP operator. The utility provides NRC-396 with the initial license submittal and then again every two years as long as the individual's license is active. A utility would typically ensure that Non-licensed operators meet similar requirements, due to training programs ensuring that competent people serve as EOs/AOs, and because of the natural career progression for an individual from Non-licensed to Licensed operator.
	Response		*These criteria are inherent in human reliability analysis (HRA). If one chooses, e.g., to transition to NFPA 805, then these criteria would implicitly be addressed (e.g., included in the uncertainty estimate for the human error probability [HEP]). In spite of competency standards, human variability, to some extent, will exist.* *Further, this is not a requirement but is for NRC staff use when evaluating future exemptions or future license amendment requests for specific manual actions in lieu of fire barriers or distance requirements under III.G.2 and for review of future licensing actions involving post fire safe shutdown. NUREG-1852 provides one coherent set of feasibility and reliability criteria that the reviewer could consider in lieu of a risk-informed/performance-based (RI/PB) approach using HRA. Relevant to this comment, as already stated in an earlier paragraph in Section 4.2.2: "Note that as before, there are at least two ways to account for these additional uncertainties associated with the time required for the manual action. One is to have purposely arrived at a conservative estimate of the time needed to diagnose the need for and implement the manual action (but based generally on the measured demonstration time) with a justification that the additional uncertainties listed below are enveloped by the conservative estimate. Another is to specifically account for the additional uncertainties listed below." This provides flexibility as to how variability among persons might be addressed.*

#	Source/ Item	NUREG Section	Comment (Technical)
22	NEI #38	4.2.3, p. 4-5	Section 4.2.3, Guidance Regarding Environmental Factors (page 4-5) states: *"Heat stress analysis should be performed as necessary."* *"Plant staff should account for expected smoke and toxic gas levels to ensure that they will not affect performance."* COMMENT: What criterion is to be used to determine when a heat stress analysis is required? If fire is in adjacent area, does heat from fire need to be included in analysis? What criteria should plant staff use to account for smoke and toxic gas? If the fire is in adjacent area of action, should you assume smoke and toxic gas is present? How far from actual fire must you assume smoke and toxic gas travels? Currently NRC has closed Generic Safety Issue GSI-148 "Smoke Control and Manual Fire Fighting Effectiveness" (refer to 466th ACRS meeting, September 30, 1999). GSI-148 dealt with this exact issue of smoke and fire effects impacting the operator's ability to perform actions. The conclusion was that the issue was plant-specific, was acceptably resolved under the IPEEE, and no generic backfit of new requirements could be justified. What regulatory process is the NRC using to re-open an issue that was closed under the GSI process?
	Response		*These are plant-specific issues to be evaluated for specific fire situations and relevant manual actions to determine feasibility and reliability per information such as that contained in the document NUREG-1852. What is cited in the comment is an IPEEE issue and is irrelevant here. The licensee should perform the evaluation and the NRC will review. This is not a GSI, but plant specific to a manual action in a post-fire SSD environment. NUREG-1852 offers references to studies of heat stress, etc., that can be used when evaluating the effects of heat stress, etc., on outside the main control room (MCR) OMAs, but intentionally does not advocate the use of one study vs. another to allow flexibility for varying plant-specific issues. This approach of providing preferably quantitative evaluation criteria, where possible, for various environmental stressors, while not advocating the use of any one specific set, was adopted throughout NUREG-1852. This was done specifically to provide this type of plant-specific and reviewer flexibility. The criteria are provided as one way to demonstrate feasibility and reliability of the manual action. Expectations are that such analyses as heat stress or consideration of smoke may be appropriate if the OMA will need to be performed where it is expected these conditions could impair the success of the action or could harm the individual. This has been clarified in Section 4.2.3 of the NUREG.*
23	NEI Key area 3 and #3	General	The guideline does not currently provide definitive acceptance criteria. Clear criteria should be established similar to that proposed in Enclosure 2.
	Response		*The staff does not agree with this comment. For instance, Enclosure 2 contains inaccurate information concerning when spurious operations occur. The limited testing does not bound most plant configurations. The NUREG-1852 criteria address feasibility and reliability when NRC staff evaluates manual actions taken in lieu of meeting III.G.2 regulations (via future exemptions or license amendment requests). It should be sufficiently general and flexible to apply to the extent appropriate for different situations and for different actions and, yet, provide useful considerations regarding each information on what to consider when evaluating "what is sufficient time?." (Also, see response to "NEI #38, 4.2.3, p. 4-5" [Table Comment #22] regarding the approach taken by NUREG-1852 to provide references to quantitative studies, where possible, but not to advocate any specific one over another.)*

#	Source/ Item	NUREG Section	Comment (Technical)
24	NEI #10	General	NEI 04-02 Revision 1 (September 2005, ML052590476), Appendix B includes discussion of feasibility and reliability of recovery actions as part of change evaluation process. Regulatory Guide 1.205 (May 2006, ML061100174) endorsed NEI 04-02, with clarifications. There appears to be no cross-reference or consideration of the content of NEI 04-02/RG 1.205 in NUREG-1852.
	Response		*NEI 04-02 (to the extent to which it is endorsed in RG 1.205) provides guidance on performing HRA for OMAs (referred to as "recovery actions" there) as part of a RI/PB fire PRA under NFPA 805. NUREG-1852 provides one coherent set of feasibility and reliability criteria for NRC reviewers to use when evaluating future OMA exemptions or license amendment requests that may be submitted on a non-RI/PB basis. Reference to the RI/PB methods in NEI 04-02 (via RG 1.205) would be inappropriate in NUREG-1852, although the type of criteria offered in NUREG-1852 are implicit to an HRA under a RI/PB fire PRA.*
25	NEI #11	General	What are the qualifications of the feasibility study analysts? It's assumed minimum requirements in terms of education, background/ experience would be defined as part of this complex guidance, which necessitates high-level judgment in order to establish the parameters of the program.
	Response		*The question is unclear with regard to who are the "feasibility study analysts." NUREG-1852 does not use the term . To respond to this question, it is assumed that the "feasibility study analysts" are individuals that the licensee has selected (and determined to be qualified) to assess the feasibility and reliability of the post-fire OMAs which they wish to credit. NUREG-1852 does not prescribe qualifications for the individuals that the licensee has selected to prepare the analysis for evaluating the feasibility and reliability of the OMAs. If using the guidance in NUREG-1852, it is expected that the licensee will ensure that the analysis satisfies all the criteria for determining the feasibility and reliability of the operator manual actions being credited. The composition and qualifications of those performing the analysis may vary as a function of, e.g., the complexity of the OMAs being credited. Because the analysis addresses a number of diverse criteria (e.g., ranging from determining expected environmental factors to executing realistic demonstrations of the OMAs), it is anticipated that the analysis will receive input from a variety of technical disciplines. Hence, a "multi-disciplined team" approach may be used. For an example of a "multi-disciplined" team with minimum qualifications for each area of expertise, one may refer to the current versions of NUREG-0711, "Human Factors Engineering Program Review Model," Appendix A, and ANSI/ANS-3.1, "Selection, Qualification, and Training of Personnel for Nuclear Power Plants."*
26	NEI #12	General	The report is intended to be a reference guide to address the feasibility and reliability of manual actions based on a deterministic approach. Could the use of NUREG 1805, "Fire Dynamics Tools (FDTs) Quantitative Fire Hazard Analysis Methods for the USNRC Fire Protection Inspection Program," as modeling tool be applied to screen the necessity of the manual action?
	Response		*Pre-1979 fire protection programs are not performance-based. A pre-1979 plant that wants to credit an OMA in lieu of III.G.2 requirements must obtain prior approval through an exemption. A post-1979 plant may be able to make changes to its fire protection program, however it must be in accordance with its operating license condition.*
27	NEI #13	General	It's recommended that plants be provided some flexibility to determine the responsibilities of the person assigned to perform the manual action. As long as the manual action is feasible and is conducted by a qualified individual, then the duties/responsibilities of that person are irrelevant.
	Response		*The staff agrees. Some actions may be taken by a qualified Senior Reactor Operator, Reactor Operator, Auxiliary Operators, technician, etc. However, in all cases their duties should not interfere or be concurrent with the credited OMA(s) [see response to "NEI #40, 4.2.10, p. 4-14" (Table Comment #58)].*

#	Source/ Item	NUREG Section	Comment (Technical)
28	BWROG *Response*	Section 1	Section 3.1: The term Operator Manual Action as defined is limited to hot shutdown actions. However, there are manual actions that are for cold shutdown, but they are typically considered non-risk significant. NRC should modify the definition and discussion to reflect that cold shutdown manual actions are allowed by regulation. *In a number of places, the NUREG states that it addresses manual actions for achieving and maintaining hot shutdown; cold shutdown repairs are allowed for 72 hours but are not the subject of this NUREG.*
29	NEI #18	Abstract, Fore-word, Introduc-tion, Glossary	The ABSTRACT and FOREWORD states: *"This report provides criteria and associated technical bases for use in evaluating the feasibility and reliability of post-fire operator manual actions implemented in nuclear power plants. The U.S. Nuclear Regulatory Commission (NRC) developed this report as a reference guide for agency staff who evaluate the acceptability of manual actions as means of achieving and maintaining hot shutdown conditions during and after fire events."* The GLOSSARY defines 'operator manual actions (local actions, in response to a fire)' as: *Those actions performed by operators to manipulate components and equipment from outside the main control room (MCR) to achieve and maintain post-fire hot shutdown, but not including "repairs." Operator manual actions comprise an integrated set of actions needed to help ensure that hot shutdown can be accomplished, given that a fire has occurred in a particular plant area.* Footnote 1 on page 1-1 states: *"Operator manual actions" are defined in the Glossary of this report. For this report, they do not include the action(s) associated with abandoning the MCR in the case of a fire* The 3rd paragraph on page 1-2 states: *"This report, as a reference guide, addresses the feasibility and reliability of operator manual actions, from a deterministic approach, when used to achieve and maintain hot shutdown under fire conditions, and will be used by the NRC staff to support the review of operator manual actions. An operator manual action which meets the guidance provided in this report does not necessarily comply with NRC fire protection regulations. Additional considerations to ensure that adequate defense-in-depth such as fire detection and automatic suppression is maintained are addressed in Revision 5 to Section 9.5.1 of the Standard Review Plan [Ref. 6] and should be considered when applying for an exemption or license amendment."* COMMENT: Item continued next row

#	Source/ Item	NUREG Section	Comment (Technical)
29 (con-tin-ued)	NEI #18 (continued from item above)	Abstract, Fore-word, Introduc-tion, Glossary (contin-ued form item above)	NEI COMMENT: (continued from above) Although there are instances where 'hot shutdown' is stated throughout the document, it is not completely clear from the above statements which actions must be demonstrated to be feasible and reliable using the criteria in the NUREG (only III.G.2 areas which contain redundant trains of cables or equipment for hot shutdown equipment or all actions)? Do cold shutdown actions need to be demonstrated to be feasible and reliable to this level of detail? What about hot shutdown actions for alternative shutdown (III.G.3) areas? The footnote states it does not include actions associated with abandoning the main control room (which is typically an alternative shutdown area); what about areas other than the MCR that use alternative shutdown (such as the cable spreading room); are actions associated with those areas required to be demonstrated to this level of detail? It appears from Paragraph 3 on page 1-2 that suppression and detection may also be required when applying for an exemption request. <u>It appears the NUREG guidance is imposing the criteria in the proposed manual action rule that was withdrawn and never adopted.</u>
	Response		*NUREG-1852 offers one coherent set of NRC staff review criteria for feasibility and reliability for OMAs when used in lieu of the separation or distance requirement in III.G.2 compliance as part of a future exemption or license amendment request to III.G.2. NUREG 1852 may be used by the NRC staff when reviewing OMAs in future post-fire SSD licensing actions. It is not based on the operating state of the reactor. Also, this NUREG does not address defense-in-depth criteria, such as detection and automatic suppression, for substituting OMAs in lieu of regulatory requirements (see RIS 2006-10, "Regulatory Expectations with Appendix R, III.G.2 Operator Manual Actions"). Note also that the rulemaking was not cancelled due to lack of credibility with regard to any of the proposed feasibility and reliability criteria contained in DG-1136, but rather because industry indicated that, even with the rule promulgated as planned by the NRC, there would be no significant decrease in the number of exemptions for OMAs that would be submitted, effectively defeating one of the main goals of the rulemaking. The NUREG-1852 feasibility and reliability criteria are consistent with the ones proposed during the rulemaking, being based on sound principles and long-standing practice by NRC inspectors and reviewers for exemptions and deviations for OMAs taken outside the MCR (this point has been added to the NUREG at the end of Section 2.1 in the NUREG). As for cold shutdown, as stated in response to BWROG comment on Section 3.1, this NUREG does not address cold shutdown.*
30	NEI #14	General	The NUREG repeatedly refers to "hot shutdown" or the ability to achieve and maintain hot shutdown. The term hot shutdown has different definitions for Pressurized Water Reactors and Boiling Water Reactors. In fact, Appendix R section III.G includes wording related to the systems necessary to achieve and maintain hot shutdown without any additional clarification and Appendix R section III.L includes wording related to the ability to achieve and maintain hot standby conditions for a PWR (hot shutdown2 for a BWR). The footnote 2 related to hot standby and hot shutdown refers to the definitions in the Standard Technical Specifications. Regulatory Guide 1.189 (April 2001) Section 5 also refers to hot shutdown for BWRs and hot standby for PWRs.
	Response		*This NUREG is accurate in that we rely on Technical Specification definitions to meet hot shutdown / cold shutdown requirements. This is consistent with Revision 1 of RG 1.189 (March 2007), which identifies the Technical Specifications of each plant as providing the definitions of hot and cold shutdown. Footnote 1 in Section 1 of the NUREG has been expanded to clarify "hot shutdown". Cold shutdown is not the subject of this NUREG.*

#	Source/ Item	NUREG Section	Comment (Technical)
31	NEI #21	Section 1, p.1-1	Footnote 1 on page 1-1 states: *"Operator manual actions" are defined in the Glossary of this report. For this report, they do not include the action(s) associated with abandoning the MCR in the case of a fire."* This note and its reference is unclear. Does this apply to actions inside the MCR prior to abandonment or actions following MCR abandonment associated with alternative shutdown capability (Sections III.G.3 / III.L of Appendix R)? Please provide clarification. [Note, the public meeting on 11/29/06, partially addressed this item, but much of the information in the slides presented at the meeting (ML0633900440) is not in the draft NUREG or other regulatory documents.]
	Response		*Operator actions performed in the MCR are outside the scope of NUREG-1852. The criteria in NUREG-1852 apply to OMAs that are credited , for example in lieu of III.G.2 protection requirements and future staff reviews of OMAs taken outside of the MCR. The criteria in NUREG-1852 are not intended for application to Sections III.G.3 / III.L of Appendix R for existing, approved, OMAs. NUREG 1852 may be used for staff review of future licensing actions relating to the use of OMAs for post-fire safe shutdown. Footnote 1 has been expanded to clarify that any actions within the MCR are not the subject of this NUREG.*
32	NEI #23	Section 1, p.1-2	Page 1-2 states: *"The NRC staff recognizes that certain criteria must be met to ensure that adequate safety is maintained as a result of the use of operator manual actions as an alternative to separation/protection. In particular, the NRC staff notes that such actions must be both feasible and reliable, especially considering that these actions are relied upon in lieu of passive fire barriers, distance, separation, and/or automatic fire suppression system each with relatively high reliability."* These statements imply that this NUREG is only applicable to the scope of operator manual actions relied upon in lieu of protection per Section III.G.2 of Appendix R. It is not clear if other allowed/approved operator manual actions are subject to the guidance in this NUREG [Refer to NEI Frequently Asked Question 06-0012, 10/26/06 Revision 1, ML063170362 for background and references]. [Note, the public meeting on 11/29/06, partially addressed this item, but much of the information in the slides presented at the meeting (ML0633900440) is not in the draft NUREG or other regulatory documents.]
	Response		*This NUREG applies to the feasibility and reliability of manual actions and contains information that the NRC staff reviewing a licensee's future exemption or license amendment request for performing manual actions may consider. The NEI FAQ program is part of the RI/PB transition to NFPA 805 and separate from the deterministic compliance issues being addressed in NUREG-1852. See responses to NEI comments #18 (Table Comment #29) and #21 (Table Comment #31).*

#	Source/ Item	NUREG Section	Comment (Technical)
33	NEI #29	3.2.1, p. 3-2 3.2.5, p. 3-8	Last paragraph, first sentence: The last phrase of this sentence, "…and the thermal-hydraulic conditions of the plant" raises the question of applicability of this NUREG relative to plant modes of operation. It is assumed this NUREG addresses the ability to perform various manual actions necessary to bring the plant to hot shutdown and maintain it there. Implied in this assumption is the plant is at full power operation when the fire event occurs. Obviously, the thermal-hydraulic conditions of the plant vary at the different modes of operation. There does not appear to be a clear reference to applicable modes of operation in the NUREG. Also note Section 3.2.5, page 3-8, last paragraph, last sentence. The phrase "normal plant evolutions" also seems to allude to different modes. *Response* *The guidance is for achieving hot shutdown as defined by Technical Specifications (see response to comment "NEI #14, General" [Table Comment #30]). This NUREG applies to the feasibility and reliability of manual actions and contains information that the NRC staff reviewing a licensee's future exemption or license amendment request for performing manual actions may consider. If OMAs are credited at other than full power, then thermal-hydraulic (T-H) conditions at these modes govern the determination of the time available to complete the action ("T3"). If there are specific conditions during modes other than full power that could present a worse case, they should be addressed on a plant-specific basis. Otherwise, the assumption is that full power should bound all possible applications of the OMA.*
34	NEI #15	General	NUREG-1852 appears to attempt to re-classify a post-fire safe shutdown as an "Anticipated Operational Occurrence" (AOO), based on an example provided in Table 3-3 of ANSI/ANS 51.1 and 52.1. The NUREG then goes on to impose various new requirements based on this classification as a AOO. As discussed in ANSI/ANS 51.1/52.1 section 3.2, the **actual** frequency of each Initiating Occurrence must be determined and Plant Condition code assigned based on it's best estimate frequency (Table 3-3 provides examples only). Since a fire requiring post fire safe shutdown **and** manual operation occurs at a much lower frequency than once per year (PC-2), the classification of these actions as AOOs is inappropriate. Current Regulatory guidance classifies a Post Fire Safe Shutdown as a "Special Event" (refer to ANSI/ANS 58.6, ANSI/ANS 58.14). The incorrect regulatory classification of fire safe shutdown manual operations as AOO's has been cascaded into an inappropriate imposition of 10CFR20, section 20.1201. Radiation dose to the operators should meet the requirements of GDC-19, as discussed in NEI 96-07, instead of referring to 10 CFR Part 20. NRC may be able to better clarify this item by consulting previous guidance provided in NUREG-0737, Item III.B.2 regarding plant shielding for post-accident operations. NUREG-0737 Item III.B.2 contemplated the need for local actions in the plant, and imposed a 5-rem whole body limit, for the duration of the event (based on GDC-19). *Response* *NUREG-1852 is not a requirements document. In ANSI 51.1/52.1 the fire event is classified under PC-2 and is an event within normal radiation exposure. An "initiating event" refers only to the single abnormal occurrence/accident condition that triggers a potential accident scenario. The initiating event does not include subsequent conditional failures, such as non-suppression, failure to mitigate potential core damage, etc., that would become part of the calculation of the frequency of the entire "scenario," not the frequency of just the initiating event. This is analogous to a LOCA, where the initiating event is just the LOCA itself, not the conditional, subsequent failures that can lead to core damage via an accident scenario. Therefore, the appropriate frequency class for fire as an "initiating event" is that given in ANS 51.1/52.1 as PC-2 (See Table 3-2). Fire is not a severe accident since it is expected that the plant will achieve hot shutdown, which is the goal. If manual actions are not adequate, then further health physics (HP) protection may be required..*

#	Source/ Item	NUREG Section	Comment (Technical)
35	BWROG (Comment on p. 3 of BWROG detailed com-ments)	Section 3	3.2.3, Third Paragraph: We recommend removing this paragraph. NUREG-1852 appears to be attempting to re-classify a post-fire safe shutdown as an "Anticipated Operational Occurrence" (AOO), based on an example provided in Table 3-3 of ANSI/ANS 51.1 and 52.1. The NUREG then goes on to impose various new requirements based on this classification as an AOO. As discussed in ANSI/ANS 51.1/52.1 Section 3.2, the actual frequency of each initiating occurrence must be determined and the plant condition code assigned based on its best estimate frequency (Table 3-3 provides examples only). Since (as discussed below) a fire requiring post-fire safe shutdown and manual operation occurs at a much lower frequency than once per year (PC-2), the classification of these actions as AOOs is inappropriate. Current Regulatory guidance classifies a Post Fire Safe Shutdown as a "Special Event" (refer to ANSI/ANS 58.6, ANSI/ANS 58.14). Based on the generic fire frequencies in NUREG/CR-6850, the sum of all fire frequencies for a plant is around 0.44/year. This translates into a typical CDF for a PWR of around 1E-05/year and a CDF for a typical BWR of around 1E-06/year, based on previous fire PRAs and IPEEEs. Of the fire PRAs reviewed for NUREG-1852, none included significant fire area results requiring local manual actions. All results were either dominated by control room abandonment and operator failure to properly perform remote shutdown, or by control room shutdown with mechanical failure of the remaining available train. In addition, NEI 00-01 pilot studies did include scenarios requiring local manual actions. All scenarios included in the NEI 00-01 results were shown to be below 1E-06/year. As can be seen from these examples, a fire requiring a local manual action (i.e., a "Worst Case" fire per BTP CMEB 9.5.1 rev 3, position C.1.b) is expected to be very low in probability, and much lower than the “one or more times during the lifetime of the nuclear power unit” stated in the NUREG and in 10 CFR 50 Appendix A. Some of the scenarios included in the PRAs reviewed did include performance of procedures that included manual actions. When the results of the PRAs are reviewed to determine the frequency of the large and damaging fire where the procedural actions are performed, these results indicate a maximum value of around 1E-04/year. The NEI 00- 01 pilot results show a limiting damaging fire resulting in procedural actions, based on step 2 results, of around 1E-06/year per fire area. Using conservative fire frequency estimates for a typical fire area of 1E-02/year (0.44 as noted above divided by 40 fire areas), a severity factor of 0.1, a non-suppression probability of 0.1, and a damaging fire frequency of 1E-04/year are estimated. This is far below the 1/40 frequency as required by 10CFR50, Appendix A. Further, the incorrect regulatory classification of fire safe shutdown manual operations as AOO's has been cascaded into an inappropriate imposition of 10CFR20, section 20.1201. Radiation dose to the operators should meet the requirements of GDC-19, as discussed in NEI 96-07, instead of referring to 10 CFR Part 20. NRC may be able to better clarify this item by consulting previous guidance provided to NUREG-0737, Item III.B.2 regarding plant shielding for post-accident operations. NUREG-0737, Item III.B.2 contemplated the need for local actions in the plant, and imposed a 5-rem whole body limit, for the duration of the event (based on GDC-19). *Response* *See the preceding answer regarding why fire as an “initiating event” is classified as PC-2. This is not a special radiation exposure but a normal exposure. The NUREG is deterministic. The manual action should not be designed to handle scenarios that go beyond the Design Basis Fire (DBF). If the DBF is exceeded, then one may even exceed PC-2 in terms of radiation exposure via a fire outside the limit of the DBF.*
36	BWROG	Section 3	Section 3.2.2, Item 1: In most cases, variations affecting the fire growth and damage time are conservatively addressed in the timing for operator manual actions. NRC should note in the NUREG that although timing variations need to be considered, the use of a conservative timing should be acceptable, without the further complication of determining multiple time-lines and running multiple operator timing scenarios. *Response* *Section 3.2.2 is a summary of the types of uncertainty being addressed. In Sections 4.2.1 and 4.2.2 of the NUREG, which discuss how one might address these uncertainties, the following text (or similar depending on whether it is 4.2.1 or 4.2.2) is provided: “Note that there are at least two (and perhaps other) ways to account for these uncertainties. One is to perform a conservative analysis (such as assuming the fire fails everything in a specific location immediately, and yet the detection of the fire triggering operator response is delayed) with a justification that the fire-related uncertainties are enveloped by the conservative analysis. Another is to perform fire modeling for some fires accounting for these uncertainties.” So the concept of using conservative timing is already addressed in the NUREG as long as the associated justification is also included.*

#	Source/ Item	NUREG Section	Comment (Technical)
37	NEI #9	General	General observation: This document provides very little guidance on the allowable time available before unacceptable conditions occur. This is a very difficult, yet important, item to understand and is closely related to another generic issue, fire-induced circuit failures (multiple spurious actuations). This 'allowable time' has a number of variables and can greatly influence the acceptability of the answer, yet there is no guidance on the subject. For example, there are implications in the NUREG that fire modeling or analysis can be performed as part of the 'time available' determination. The ability to use these approaches as part of a 'deterministic' approach is unclear. Technical approaches to bound thermal-hydraulic conditions of the plant given simultaneous failures are challenging, since fire losses and spurious actuations are different for different fire areas, and assuming simultaneous failures increases the number of variables that must be considered. Also unknown are the assumed initial conditions and plant behavior due to fire that must be assumed in the analyses, such as: • Time = 0 • Time of spurious actuations • Operator response time to initiate procedures and perform actions • Plant initial conditions (i.e. starting pressurizer level, steam generator level, power lineup) • Behavior of other components in the fire area (is everything else failed initially or placed in 'worst case' condition?) It is clear that an analyst would attempt to identify bounding conditions to assess the impact of fire on the plant and operator response. However, for many fire areas, an unlimited number of concurrent failures does not represent a case that can be bounded in a realistic or cost effective manner and demonstrate compliance with deterministic requirements. Additional guidance on this topic is warranted. Without guidance and consistent analytical treatment, regulatory expectations will be difficult to meet. It is believed that the uncertainties and variations in the plant response (e.g., spurious actuations and plant thermal-hydraulic response) may have a dominant role in the overall feasibility/reliability determination, yet there is no clear guidance on the subject.
	Response		*The information on allowable time is part of what goes into determining adequate time and the subsequent criterion for the Time Margin. Time = 0 is fire detection time (or may be at the start of the event in a non-mechanistic conservative assessment of the time available), and all elements thereafter are assumed based on this timing; however, the manual action should be feasible and reliable for all possible fire conditions similar to the performance and integrity of a fire barrier which is feasible and reliable. If the conditions are so variable and analysis too complicated such that development of a defensible time margin is not possible using a deterministic approach, then there are other options, e.g., meet the standard III.G.2 criteria or transition to NFPA 805 (see RIS 2006-10, "Regulatory Expectations with Appendix R, III.G.2 Operator Manual Actions").*
38	TVA #3	Section 3.2.1	Additional guidance should be provided for determining allowable operator action time(s). For example, Appendix R events are postulated to occur when the plant is operating normally at full power. As such, it would seem reasonable to evaluate allowable times based on normal tank levels vs. minimum as done with postulated accidents such as steam line break and loss of coolant accidents. In many instances, this conservatism could alter the allowable time substantially.
	Response		*Demonstrations and time margins would establish these results based on operator and plant conditions and variables. Sections 3.2.1 and 3.2.2 of the NUREG summarize these criteria. As stated in Section 4.2.1, with respect to meeting the criteria, it is stated: "Note that there are at least two (and perhaps other) ways to account for these uncertainties. One is to perform a conservative analysis (such as assuming the fire fails everything in a specific location immediately, and yet the detection of the fire triggering operator response is delayed) with a justification that the fire-related uncertainties are enveloped by the conservative analysis. Another is to perform fire modeling for some fires accounting for these uncertainties." For a purposely non-conservative analysis, use of best estimates with bounds determined through the demonstration and time margin criteria would be appropriate for an analyst employing NUREG-1852.*

#	Source/ Item	NUREG Section	Comment (Technical)
39	BWROG	Section 4 and Appendix A (1)	Appendix A, Items 3 and 4: Item 3 lists that the analyst should include a "worst case time" while item 4 suggests adding margin to account for uncertainty. For the model presented in the appendix to work, either the margin needs to be removed, or the worst-case time needs to be a best estimate time. Now, the best estimate time can be based on conservative assumptions, where assumptions are needed. However, the worst-case time should not be used for all steps in the timeline. If a worst-case time were used, this would already represent the upper bound, removing the need to include additional margin.
	Response		*It appears that different concepts have been misinterpreted by the comment. In the case of reactive actions, the "worst-case" references in this section of the document refer to that time that an analysis with this level of detail should assume as to when equipment might be affected by the postulated fire. In other words, by assuming the failure (or spurious operation) occurs at that time, it leads to the least time available (allowable) for the action to be completed (the text specifically mentions T3 as the time being discussed with reference to the "worst case time"). Then, when judging or otherwise demonstrating how long it will take to perform the desired action (i.e., the implementation time for the action), because of uncertainties, some margin should be added to the implementation time especially if a demonstration/judgment used to estimate this time applies more to "ideal" conditions. Then if the implementation time, with added margin, is less than the above mentioned allowable time, adequate justification exists that the OMA can be performed reliably, even for situations with the least amount of time available to perform the reactive action. If the implementation time, including added time to cover potential uncertainties in completion time, is greater than the allowable time, then reviewers may (1) investigate whether there are legitimate reasons to assume the estimates of the time available were too conservative, (2) determine whether a quicker or more efficient way to implement the action is possible (e.g., more than one person performs the task), or (3) question the reliability of the OMA.* *For preventive actions (a different subject altogether), one has to recognize that there is potentially a "race" between (a) the time it takes to diagnose and implement the preventive action and (b) the time at which the equipment of interest might fail or spuriously operate because of the postulated fire. The point being made for this situation is that, for an analysis at this level of detail, if it is reasonably possible that the equipment failure/spurious operation could occur before the preventive action can be completed that would otherwise prevent this undesirable state, then the completion time for the preventive action should include additional time to take an additional reactive action to restore the equipment to the desired state in case it is necessary to do so. We called this the "worse case for the time to complete preventive actions." We agree that for this second case, this may not have been clear and so Appendix A and Section 4.2.11.9 have been modified accordingly to clarify the intent. For related information, also see the response to the comment BWROG on Section 4 and Appendix A (2) [Table Comment #40]of the draft NUREG.*
40	BWROG	Section 4 and Appendix A (2)	4.2.11 and Appendix A General: In the document, the requirement is that the worst case time for damage (including spurious operation) should be assumed. However, this may result in unrealistic scenarios if damage is assumed too soon. An option should be considered if the damage time is calculated, based on a worst-case fire location and an upper bound (see Fire SDP) fire size. If for example, a cable is located 7 feet above the nearest cabinet (thermoset cables, with no possible cable fires for this example), and the fire modeling of a 200 kW fire determines 12 minutes to damage, then the 12- minute number should be used for any time-line. This is the earliest time that damage would occur with the largest likely fire, and would be better than assuming damage occurs immediately. Immediate damage may be possible for explosive fires, but is not likely for all other fire types. Therefore, conservative fire modeling should be allowed for determining the expected upper bound damage time for timelines.
	Response		*We agree (and we intended) that determination of the worst-case timing of when the relative equipment might be damaged could be done, for instance, by (a) making a non-mechanistic conservative assumption or (b) performing some level of fire modeling as suggested by the comment. We have modified both Appendix A and 4.2.11.9 to more explicitly state that some level of fire modeling is a useful way to determine the "worst case timing." Also, see response to "BWROG, Section 4 and Appendix A [1]" (Table Comment #39) for more on the interpretation of these two sections.*

#	Source/ Item	NUREG Section	Comment (Technical)
41	BWROG	3.2.2 Item 2, bullets	3.2.2, Item 2, Bullet 1: NRC should remove the requirements in the NUREG for taking into account all the possible delays in determining operator action timing. It is literally impossible to determine both all of the possible delays and the variation in the operator action timing due to the delay. For example, listed in the example are locked doors, stiff hand wheels, or difficulty with communication devices. • With doors, we would need to identify all of the doors, estimate the likelihood that each door is locked, and then determine the possible delay (accounting for alternate routing) for each door. • For stiff hand wheels, we would need to determine the possible delay time for a stiff hand wheel for each valve type and location. For example, if the valve were on a platform above the floor, the timing to loosen that valve would be different than a valve at ground level. • For difficulty with communication devices, we would need to look at an array of difficulties, including dead batteries, areas of the plant where communications are difficult or radios are intermittent, dropping a radio, etc. All of this would be impossible to consider in the analysis. Additionally, most of these are low probability events and are within the established conservatism for the overall reliability of the action. The imposition of these random impediments is also inconsistent with previous NRC guidance for performing safe shutdown analyses, which assumes that components or systems required for FSSD are not out of service prior to the fire and that components are in their normal operating position or status prior to the fire. "Worst case" fires need not be postulated simultaneously with non-fire-related failures in safety systems, plant accidents, or the most severe natural phenomena." (BTP CMEB 9.5.1 rev 3, position C.1.b).
	Response		*The NUREG provides technical information; it is not a requirement. The referenced bullets in the comment are provided in Section 3.2.2, item 2, as examples (as stated in the text) of uncertainties that can exist in assessing if there is adequate time and hence why a time margin is appropriate. Where the criteria are addressed , the following statement is made in Section 4.2.1: "Note that there are at least two (and perhaps other) ways to account for these uncertainties. One is to perform a conservative analysis (such as assuming the fire fails everything in a specific location immediately, and yet the detection of the fire triggering operator response is delayed) with a justification that the fire-related uncertainties are enveloped by the conservative analysis. Another is to perform fire modeling for some fires accounting for these uncertainties." A similar statement is made in Section 4.2.2: "Note that as before, there are at least two ways to account for these additional uncertainties associated with the time required for the manual action. One is to have purposely arrived at a conservative estimate of the time needed to diagnose the need for and implement the manual action (but based generally on the measured demonstration time) with a justification that the additional uncertainties listed below are enveloped by the conservative estimate. Another is to specifically account for the additional uncertainties listed below, adding additional time for each applicable uncertainty to the time required for the action as measured from the demonstration."* *These statements are meant to provide flexibility as to how the uncertainties might be addressed. While accounting for the potential numerous "impediments" may be difficult, it is not "impossible." The degree of difficulty should be one factor in determining whether to attempt compliance via an exemption for OMAs or else to exercise one of the other options, e.g., comply via standard III.G.2 or transition to NFPA 805, where probabilistic techniques are available to more readily address the variability in these "impediments." Reliability of human actions is not "calculated" in a deterministic analysis, such as the type to which NUREG-1852 is intended to apply, but falls readily into the realm of HRA and PRA, arguing strongly for the use of the latter if the "difficulties" referred to above become too much to easily overcome. This being said, the licensee still has an option, for instance, to use bounding estimates for the variety of "impediments" cited above, such as maximum delay to retrieve a key for a locked door, longest time to procure the proper tool to loosen a stiff hand wheel, etc., and then use these bounding values generically for the majority of OMAs for which they are seeking exemptions (and refining the estimates for those where the bounds are prohibitive).*

#	Source/ Item	NUREG Section	Comment (Technical)
42	BWROG	Section 3.2.2 Item 2, Bullet 3	3.2.2, Item 2, Bullet 3: NRC should remove any requirement for considering temporary conditions that may be present. These conditions, being temporary, are low probability events especially when considered in conjunction with a fire. Present requirements for 10CFR50.59 allow for temporary changes of a maximum of 90 days, with typical temporary conditions of only a few days. With a range of 1-90 days (low and high range), this represents a spectrum of probabilities between a 7E-05 and 6E- 03 of a temporary condition being present when an action is needed. This range should have a minor effect on the overall manual operation human error probability for most manual operations. Additionally, it would be impossible to determine all of the possible temporary conditions that may occur at the plant. Overall, these temporary conditions should have no impact on the overall risk associated with manual actions. The imposition of these random impediments is also inconsistent with previous NRC guidance, as discussed above.
	Response		*We agree that the intent was not to address low probability temporary situations, but instead to consider routine or typical situations that may further impact the timing of the action, for instance, the typical locations of staff relative to postulated fire locations and typical activities such as personnel performing maintenance that may involve some delay before they can participate. This clarification has been added to both Sections 3.2.2 and 4.2.2 of the NUREG.*

#	Source/ Item	NUREG Section	Comment (Technical)
43	NEI #17	General	NUREG-1852's suggestion that all possible anticipated delay factors or the addition of time margin factors is fundamentally at odds with numerous other aspects of how safe shutdown analyses are performed. The NRC has previously accepted the fundamental concept of using "nominal" values and "best estimate" codes for analyzing the plant's response to the fire event. This includes assuming many plant parameters are initially at nominal values prior to the event, not imposing Appendix K conservatisms such as +2-sigma decay heat, and not requiring explicit treatment of instrument uncertainty. This approach is based on previous and current NRC guidance (ex., "Worst case" fires need not be postulated to be simultaneous with non-fire-related failures in safety systems, plant accidents, or the most severe natural phenomena. BTP CMEB 9.5.1 rev 3 section C.1.b). By not permitting a "best-estimate" approach to operator action timing, NUREG-1852 represents a significant departure from existing NRC guidance, and also creates a dissonance where an ultra-conservative method must be used to determine the operator action time estimate, yet a best-estimate approach may be used to calculate the upper time limit for the action. No technical, risk, or regulatory basis is provided for requiring Licensees to go beyond a best-estimate approach for calculating operator action timing. Industry believes that sufficient margin is already built in by the analysis methodology itself, which assumes that all fire damage occurs and consequently all manual actions must be performed, which requires all actions to be sequenced and accounted for in the operator action timing. Due to the unpredictable nature of fire and resulting damage, and the requirement to maintain 1 train free of fire damage, both trains may be damaged from a single fire if III.G.2 is not met. Thus, not meeting III.G.2 by a barrier or adequate spacing means that unacceptable fire damage could occur. That is why an operator manual action is "required" (as an exemption) and NUREG-1852 provides considerations regarding making the OMA as reliable as possible to ensure SSD.
	Response		*A number of other comments provide specific examples of the type of concern raised by this comment including the following comments: "TVA #3, Sec. 3.2.1," "BWROG, Sec. 4 & Appendix A(1)," "BWROG, Sec. 4 & Appendix A (2)," "BWROG, 3.2.2 Item 2, bullets" and "BWROG, 3.2.2, Item 2, Bullet 3" (Table Comments #38 through #42). The responses to these other comments are applicable for this comment (see those responses). Those responses discuss the possible methods to address the various uncertainties that should be considered since these actions are in lieu of meeting separation requirements. As mentioned in sections 4.2.1 and 4.2.2 of the NUREG, at least one method includes use of conservative analyses with justification as to why the uncertainties are covered. This approach is more closely related to the comment discussion that "sufficient margin is already built in by the analysis methodology itself," but justification should be provided as to how the uncertainties are already covered by virtue of the methodology. Another method, for instance, is to do some semi-realistic fire modeling to determine possible times for equipment damage and to correspondingly determine times to implement actions based on demonstrations (hence using more of a best-estimate approach). In this latter approach, to the extent the relevant uncertainties for the action of interest are not included (such as due to the ideal conditions of the demonstration), some additional time should be considered to allow for these uncertainties (hence the time margin concept). As reiterated in section 4.2.11 (now even more clearly due to incorporation of a different comment-response), a tradeoff exists between the extent the demonstration is realistic, and the uncertainties to be addressed as part of justifying there is adequate time to perform the operator manual action. For instance, more realistic demonstrations translate into less uncertainty with regard to justifying there is adequate time and so the time margin can be smaller.* *In the end, the uncertainties genuinely exist (they are not just analytical artifacts). For deterministic-based analysis where the individual actions cannot be ranked as to their risk importance, it is necessary to cover all actions that may be needed. Thus, in all cases, these uncertainties should be addressed (in some manner) to show the actions are feasible and reliable.*

#	Source/ Item	NUREG Section	Comment (Technical)
44	BWROG	Section 4	4.2.2,a, bullet 1: See comment above for 3.2.2, item 2, bullet 1. It is impossible to estimate delays for all possible conditions listed. 4.2.2,a, bullet 2: See the Section 3.2.2 comments on "temporary" conditions. All temporary conditions cannot be estimated, and temporary conditions are by definition, low probability since they are short lived. NRC should remove requirements to assess temporary conditions for each operator action. 4.2.2, item b: It is not possible to demonstrate all of the listed crew differences. As such, listing all of the possible differences does not support the guidance. Finally, the demonstration in Item 3 under 4.2.1 does not account for these uncertainties, since quantification of these issues (such as emotional responses to fire/smoke) are not possible. NRC should remove the requirement to assess listed crew differences. 4.2.5: See the comment on 3.2.5 above on needing indication for successful complete of an action. In most cases, this is not needed to ensure feasibility or reliability. 4.2.6, bullet 1: There are two concerns here. • First, it is not possible to demonstrate that the effects of a fire will not cause "electrical interference." There is no method for demonstrating this. • Second, it is likely that many fires will damage some communications equipment. The statement should be re-written to require that an undamaged communications method is available, rather than require that a fire will not damage communications equipment.
	Response		*Except for one, all of these issues have been answered in the responses to other comments and, in some cases, clarifying modifications have been made to the NUREG. See responses to the following comments: "BWROG High Level #1;" "BWROG Section 3;" "TVA #3, Sec. 3.2.1;" "BWROG, Sec. 4 & Appendix A(1);" "BWROG, Sec. 4 & Appendix A (2);" "BWROG, 3.2.2 Item 2, bullets;" "BWROG, 3.2.2, Item 2, Bullet 3; and NEI #37, 4.2.2(b)" [Table Comments #17, #21, #36, and #38 through #42]. One item that is somewhat new is that about "electrical interference" as related to "communications damage." The intent, as is clarified in responses and subsequent NUREG modifications to other related comments (BWROG, Section 4(1); and TVA #6 - see these comments/responses [Table Comments #72 and # 73]), is that if communications equipment is required in order to perform the OMA (e.g., not just using face-to-face interactions), the equipment should also be available and functional since it is "needed" to perform the OMA. The citing of electrical interference was too specific and has been removed from the NUREG. Nevertheless, the intent of having a functional communication method (to the extent it is necessary so that the OMA can be successfully performed) remains valid.*
45	NEI #36	4.2.2, p. 4-3	Section 4.2.2, Guidance Regarding the Analysis Showing Adequate Time Available To Ensure Reliability (page 4-4) discusses additional uncertainties that require increasing the time required to conduct operator manual actions due to difficulties such as locked doors, stiff handwheel, or erratic communications. COMMENT: This requirement appears to be aimed at adding some type of a failure criterion into the analysis; due to the defense-in-depth nature of Appendix R, single failure criteria is not required to be addressed. This appears to be in conflict with that criterion (ex., "Worst case" fires need not be postulated to be simultaneous with non-fire-related failures in safety systems, plant accidents, or the most severe natural phenomena. BTP CMEB 9.5.1 rev 3 section C.1.b). This language also creates the likelihood for differences between subjective technical opinions between the licensee and the NRC.
	Response		*These are true uncertainties that should be considered in a demonstrable time line. The single failure criterion is irrelevant because there is no train free of fire damage when not in compliance with III.G.2. See the similar comment "BWROG, 3.2.2, item 2 , bullets" and its response for how one might consider/address these uncertainties (Table Comment #41).*

#	Source/ Item	NUREG Section	Comment (Technical)
46	NEI #35	3.2.11, p. 3-13	Section 3.2.11 discusses each crew performing an integrated demonstration of fire scenarios. An integrated demonstration is a significant change in expectations that would create extreme burden on operator resources. A typical plant may have between 50 and 100 fire safe shutdown procedures, which contain typical actions that are common to most of the procedures. It seems the draft NUREG finds it acceptable to demonstrate only a couple of bounding procedures, such that all of the typical, complex actions are periodically performed. This seems to be a new expectation not previously expressed. Initial verification and validation of the feasibility of an action should suffice combined with periodic task based training and JAMS. The draft NUREG requires continuous V&V of manual actions, which is extremely burdensome, a configuration control problem, and doesn't seem justified based on the IPEEE insights. The new requirement in Demonstrations Section 3.2.11 creates significant new burden to Operations Department Training with the expectation that each crew perform an integrated demonstration for a fire scenario, including all elements such as diagnostic capability, in plant actions and simulated use of tools and equipment. This concept suggests the integrated use of the simulator in concert with in-plant operator actions. This type of exercise is not typically performed and would be a great burden to have to perform on a regular frequency. Currently, the Operator training program trains licensed operators on use of the fire safe shutdown procedures using the simulator and separately, the non-licensed operators receive task-based training for the typical manual actions, such as manually racking of electrical breakers, local start of an emergency diesel, local start of an Auxiliary Feedwater pump, and local manual operation of motor-operated valves. This training is also applicable to non-fire safe shutdown procedures such as the abnormal procedures. Job Performance Measures (JPM) are periodically performed to test personnel on performance of these tasks, some of them are timed. Therefore, a requirement to have separate fire-only demonstrations would be duplicitous to other training, JAMS and simulator demonstrations that already occur.
	Response		*It is recognized that, relative to other training activities, the demonstration described in NUREG-1852 may be more "robust" than other demonstrations (e.g., routine operator training). The staff believes, however, that the demonstration criteria used to determine the feasibility and reliability of operator manual actions credited, via future exemption or license amendment request, in lieu of physical separation criteria (which are statutory requirements stated in 10 CFR 50, Appendix R, Section III.G.2), should be sufficiently rigorous to maintain a level of defense-in-depth comparable to that provided by the physical separation criteria. It is noted that Section 4.2.11 in the NUREG, where implementation of the Demonstration criterion is addressed, provides considerable flexibility for the licensee to determine what actions and scenarios are so complex that they should have subsequent periodic demonstrations. Otherwise, as also stated in the NUREG, routine training or practice such as on just the critical aspects of the actions in line with an existing training program should suffice. Further clarification has been added in Section 4.2.11 with regard to the initial demonstrations - see response to comment "NEI #33, 3.2.9 & 4.2.11" (Table Comment #54).*
47	NEI #20	Glossary, p. xiv	'Reliable action' is described as an action that can performed under varying conditions that typify uncertainties in the available time with a high success rate. What is considered a high success rate? If a crew fails, what remedial actions are required to remain bounded within Appendix R design function which is crediting the manual operator action?
	Response		*If the specific human error probability value is key to crediting the manual action, then an RI/PB approach is appropriate , e.g., an NFPA 805 transition. The NUREG specifically refrains from assigning a numerical value to the definition of "reliable." Certainly the intent of the NUREG is to address criteria that, if met, should make the OMA as reliable as is reasonably achievable considering uncertainties inherent to fire scenarios and human responses.*

#	Source/ Item	NUREG Section	Comment (Technical)
48	BWROG Section 1 Paragraph 1	Section 1	Paragraph 1: Traditional fire protection defense-in-depth (DID) includes prevention of fires from occurring, detection and suppression, and safe shutdown given that a fire is not suppressed. If safe shutdown fails, Appendix R and additional fire protection programs do not prevent radioactive releases to the environment, since they are based on the deterministic requirement that adequate core cooling be maintained. Only risk-informed fire protection programs provide some analysis in this area, and it is focused only on the fire fighting activities, not on typical release protection such as containment closure. We recommend removing item 2 from the discussion and changing the DID discussion to the traditional DID discussion. *Response* *The staff agrees that traditional fire protection includes DID. However, the staff does not agree that the existing deterministic regulations do not prevent release of radioactive releases to the environment. Existing regulations do not assume a single failure and, by maintaining shutdown and DID requirements, do prevent a radiological release. OMAs are not DID elements and the potential to perform safe shutdown exists regardless of any fire protection DID guidelines. Enhancements to DID are needed due to reductions in DID by missing or degraded fire barriers.*
49	NEI #22	Section 1, p.1-1	This section discussed three methods related to compliance with Paragraph III.G.2 of Appendix R, outside of primary containment and discusses Paragraph III.G.3 of Appendix R if the three methods are not met. The section omits Sections d, e, and f of Section III.G.2. This should be corrected to provide a more complete context and scope of the NUREG. *Response* *The suggested change is not appropriate for this NUREG considering its scope because manual actions inside containment (not in the scope of the document) are not expected to be performed because one cannot also rapidly detect and/or suppress a fire inside containment. That is why there are different criteria.*
50	NEI #24	Section 1, p. 1-2	Page 1-2, paragraph 3 states: *"An operator manual action which meets the guidance provided in this report does not necessarily comply with NRC fire protection regulations. Additional considerations to ensure that adequate defense-in-depth such as fire detection and automatic suppression is maintained are addressed in Revision 5 to Section 9.5.1 of the Standard Review Plan [Ref. 6] and should be considered when applying for an exemption or license amendment."* This statement implies that the use of operator manual actions requires a license amendment or exemption. Recent regulatory correspondence acknowledges the use of certain types of operator manual actions are allowed or have regulatory acceptance. This should be reflected in this NUREG. [Refer to NEI Frequently Asked Question 06-0012, 10/26/06 Revision 1, ML063170362 for background and references]. *Response* *When the issue of unapproved OMAs was first raised, the NRC staff sought advice from the Office of General Counsel (OGC) as to whether Appendix R, Paragraph III.G.2, permits licensees to rely on OMAs in lieu of fire barriers. OGC advised the staff that the regulation cannot be reasonably interpreted to permit reliance upon OMAs with respect to redundant safe shutdown. Therefore, any pre-1979 licensee that is using OMAs in lieu of fire barrier separation without an NRC-approved exemption is not in compliance with regulations. Subsequent to the withdrawal of the OMA rulemaking proposal, NRC issued RIS 2006-10, "Regulatory Expectations with Appendix R, III.G.2 Operator Manual Actions." This, and not NUREG-1852, addresses regulatory requirements with respect to OMAs taken in lieu of the III.G.2 fire protection provisions, including the need for fire detection and automatic suppression. NUREG-1852 provides feasibility and reliability criteria for NRC staff to use when reviewing future OMA exemption or license amendment requests; it does not provide requirements with respect to the regulatory propriety of OMAs (see RIS 2006-10), and it is not appropriate to introduce discussion of the regulatory requirements in the NUREG.*

#	Source/ Item	NUREG Section	Comment (Technical)
51	NEI #25	Section 1, p. 1-2	Reference is made to Revision 5 of NUREG 0800. Clarification is needed on the reference to Revision 5 of Section 9.5.1 of NUREG 0800. Reference 6, page 5-1, indicates this revision is planned for February, 2007. Will this revision incorporate the impacts of NUREG-1852? There is currently no reference to a Revision 5 in the NRC documentation.
	Response		*The technical guidance which was formerly in the SRP are contained in the Revision to RG 1.189, which refers to the NUREG as providing information for OMAs, not requirements. The reference has been changed accordingly.*
52	NEI #27	Section 2, p. 2-2	First paragraph on page 2-2 is incorrect and should be removed. The reference to Thermo-Lag is misleading and does not represent the fact that operator manual actions have been utilized at licensees for a number of years prior to the Thermo-Lag resolution efforts. This position has been presented previously, most notably in the January 27, 2004 letter from NEI to the NRC, Comments on Draft Criteria for Determining Feasibility of Manual Actions to Achieve Post-Fire Safe-shutdown, 68 FR 66501 and 68 FR69730.
	Response		*The staff does not agree with this comment. A few licensees inappropriately interpreted Appendix R, Section III.G.1, to allow OMAs in lieu of the requirements of Section III.G.2. Exemptions for OMAs in lieu of the III.G.2 requirements were requested and approved by the staff for various licensees. Nonetheless, the majority of inspection findings resulted from licensees attempting to replace credit for Thermo-Lag via OMAs without submitting exemption requests.*
53	NEI #28	Section 2., p. 2-4	The scope and context of this document is unclear. There does not appear to be a clear tie within RIS 2006-10 to this NUREG to each other. There needs to be a clear description of the scope of this document. The second sentence in section 2.3 refers to revision 5 of the SRP 9.5.1 for details on how NUREG-1852 is going to be used in reviews. Rev. 5 of NUREG-0800 (Nov. 2006, ML062970164) does not have detail on operator manual actions (the redline version shows this information contained in Rev. 4 as being deleted in Revision 5). [Note, the public meeting on 11/29/06, partially addressed this item, but much of the information in the slides presented at the meeting (ML0633900440) is not in the draft NUREG or other regulatory documents.]
	Response		*There should be no tie. The RIS describes the corrective actions for failures to have a required fire barrier and the use of OMAs as an interim compensatory measure. This NUREG describes many of the attributes that may be considered for evaluating the feasibility and reliability of an OMA in a future exemption or license amendment request. The reference to revision 5 of SRP 9.5.1 has been changed - see response to comment "NEI #25, 1, pg 1-2" (Table Comment #51).*

#	Source/ Item	NUREG Section	Comment (Technical)
54	NEI #33	3.2.9, p. 3-10 4.2.11, p. 4-14	The NRC's feasibility and reliability criteria on page 3-1 requires: • There should be plant *procedures* covering each operator manual action required to achieve and maintain hot shutdown and *training* for each operator on the procedures. • There should be periodic *demonstrations* of the manual actions, consisting of actual executions of the relevant actions to the extent possible. Section 3.2.9 Procedures and Training states: *"…each operator that might be required to perform the actions to achieve and maintain hot shutdown, receives training on these manual actions."* *"Analogous to the fire brigade drills, drills for operator manual actions should include assessment of alarm effectiveness; operator time response; use of portable equipment, including communication devices and personnel protection; each operator's knowledge of his or her role; and conformance with established plant procedures."* Section 4.2.11, Guidance Regarding How To Perform a Demonstration (page 4-14) states: *"…each action needs to be demonstrated at least once (by one randomly selected but established crew) to show that the feasibility and reliability criteria have been and continue to be met."* COMMENT: Is training, demonstration, and drilling required for each specific manual action required or is it acceptable to train, demonstrate, and drill on types of actions (for instances, generic training, demonstration, or drilling on re-positioning a valve using the hand wheel verses training, demonstration, drilling on all the specific valves requiring manual re-positioning)? For types of actions that operators are trained on (such as re-positioning a valve with the hand wheel or operating a breaker), specific training, demonstration, or drilling on each individual component should not be required. This criteria appears to be more stringent than for other design basis events.
	Response		*See response to "NEI #35, 3.2.11, p. 3-13" (Table Comment #46). The OMA should be demonstrated to analyze it properly and bound it. Text has been added to Section 4.2.11in the NUREG further clarifying the use of bounding techniques to cover similar OMAs under similar circumstances.*
55	BWROG	Section 4	4.2.9.1: The section describing the procedural requirements, including review guidance, is redundant to already existing requirements for developing plant procedures (see paragraph 2 in). In particular, the guidance in paragraphs 2, 4, and 5 should be simplified or eliminated, since requirements for procedural development at the plant already provide detailed instruction on these issues. 4.2.9.2: Similar to 4.2.9.1, once an action is put into a procedure, training is required. Much of the discussion in 4.1.9.2 is redundant to existing operator training requirements, and should be removed from this guidance. It is enough to just state that any local manual actions are placed in the training program and are therefore treated similarly to other procedural actions. However, the guidance should be limited to specific guidance related to local manual actions only.
	Response		*We agree. The NUREG, Section 4.2.9, has removed these aspects already covered by other programs with only a brief reference to these other existing programs. A corresponding "fix" has also been added to the end of Section 3.2.9.*

#	Source/ Item	NUREG Section	Comment (Technical)
56	NEI #39	4.2.4, p. 4-6	Section 4.2.4, second bullet, states that credit should not be taken for manipulation of components exposed to the fire, except for rare cases such as non-fire affected components in the zone long after the fire is extinguished. A number of plants have credited manual operation of valves in affected fire zones after the fire is extinguished and access to the area is re-established. This is an approved FHA assumption that mechanical components don't fail due to fire damage. Specifically, valves are assumed to remain operable via local manual operation following extinguishment of the fire and return of the valve components to the normal ambient temperatures. NRC has previously accepted a variety of "re-entry times" based on the fire hazards and protection available in the area. These re-entry times vary from 30 minutes (one licensee) to 1- hour or more. NRC acknowledges the concept of "re-entry" in SECY-90-016. This section also states that the "plant staff should provide justification as to the continued functionality of the component…". It is not clear what form of justification the NRC is expecting. In the past, the NRC has accepted very qualitative arguments. NRC correspondence to licensees on these issues also reflects the significant use of "judgment" by the NRC vs. quantitative analysis. It is expected that in the future, professional Fire Protection Engineering judgment will still be the only practical way to evaluate these issues. The licensee must ensure that a fire does not result in a maloperation of a valve or damage to an SSC that would cause it to be inoperable in the manner required for success of the OMA. Per SECY 90-016, re-entry into a fire area for repairs and operator actions is generally not allowed. It states: "Therefore...designers must ensure that safe shutdown can be achieved, assuming that all equipment in any one fire area will be rendered inoperable by fire and that re-entry into the fire area for repairs and operator actions is not possible. Because of its physical configuration, the control room is excluded from this approach, provided an independent alternative shutdown capability that is physically and electrically independent of the control room is included in the design." *Response* *Licensees wishing to credit re-entry may consider, e.g., license amendment, transitioning to NFPA 805, etc. (see RIS 2006-10, "Regulatory Expectations with Appendix R, III.G.2 Operator Manual Actions"). This clarification has been added to the section 4.2.4 as a footnote.*
57	TVA	Section 4.2.4	This section should indicate when an area could be considered "accessible" after a fire. In the past, staff reviewers and plants have utilized 1 hour as the guideline. This limitation should be defined or guidance should be provided for the licensee to make a determination. *Response* *See the response to comment "NEI #39, 4.2.4, p 4-6" (Table Comment #56) related to SECY 90-016. Fires that damage one train may make it critical to perform an OMA (approved via an exemption). One cannot consistently predict fire effects, so a specific scenario for each exemption request is necessary.*
58	NEI #40	4.2.10, p. 4-14	Section 4.2.10 requires that operators credited with performing manual actions should be on-site at all times. This is written too broadly and becomes an overly-prescriptive requirement. It does not consider plant-specific situations where actions may not be needed for many hours, and does not acknowledge the plant staff augmentation available under the Emergency Plan. This requirement can be re-stated in a more general way such as "Personnel credited with performing actions shall be available within the time frame credited in the analysis. Credited personnel may be normally on-site, or available thru the Emergency Planning staff augmentation system." *Response* *The NRC staff agrees with this comment and the modification has been made to both Sections 3.2.10 and 4.2.10 of the NUREG. However, the licensee should provide justification for allowing the plant staff credited with performing the OMA to be "available" rather than "on-site." Also, as previously stated, "...in all cases their duties should not interfere or be concurrent with the credited operator manual action(s)." (see response to "NEI #13, General" [Table Comment #27] and response to "NEI #34, 3.2.10, p. 3-12" [Table Comment #79]).*

#	Source/ Item	NUREG Section	Comment (Technical)
59	NEI #41	Appendix B	Appendix B is a summary of a draft expert elicitation that was associated with operator manual action rulemaking. The panel was comprised entirely of NRC and their contractor staff. This does not appear to provide diverse perspectives on the practical assessment and implementation of operator manual actions at nuclear plants. In addition, the focus of NUREG-1852 is intended to be guidance related to a 'deterministic' approach. The content of the NUREG is very 'performance-based'. In addition, the expert panel referenced in Appendix B was heavily represented by PRA practitioners and expertise.
	Response		*Appendix B is provided only as an example of how one might develop a time margin, which would be part of a future exemption or license amendment request. Recognize that OMAs by their very nature are performance based, so allowing them even via exemption requires consideration of performance-based aspects. The qualifications of the panelists are included in the appendix, and at least one was a former SRO and two were experienced NRC regional fire inspectors. One was a human factors specialist. The remaining two would be classified primarily as PRA practitioners.*
60	NEI #42	Appendix B	NUREG-1852 provides extensive detail on how to factor in all the uncertainties related to operator actions. Based on all these factors, it is apparent that a significant time margin will be required for manual operator actions. The guideline is so restrictive in nature that many utilities will not have enough time to achieve the standard remote safe shutdown manning function. This task could realistically be accomplished within 30 minutes but if all the unanticipated variations in fire and plant conditions are included, this task timeline could be extended to an hour. Because there's a lack of clear quantitative guidance as to what the operator time margins should be, both utility analysts and regulators will default to using the factor of 2 extra margin guidance inferred in Appendix B, Summary of Expert Opinion Election to Determine Time Margins.
	Response		*The appendix is provided for example only, and it just so happens that the panel chosen developed a time margin factor of ~2 (with all the variability among the panelists preserved in the appendix to indicate flexibility). Since this NUREG, and especially this appendix, does not give requirements, there is no expectation that NRC reviewers will default to the factor of 2 time margin in lieu of anything else. What is clear is that the licensee should address the time margin criterion, and this appendix provides an example of one way that was attempted, with some degree of success.*
61	NEI #43	Appendix B	The NUREG states that "For a feasible action to be performed reliably, it should be shown that there is adequate time available to account for uncertainties in estimates of the time available and in estimates of how long it takes to diagnose and execute operator manual actions". There is discussion about the time margin criteria that was planned as part of the proposed manual action rulemaking that was ultimately cancelled. The impression is that since the NUREG contains a discussion of the time margin criteria from the proposed manual action rulemaking that it will become the expectation or certainly be very subjective from one inspector to another going forward. The NUREG states that plant staff should be able to successfully defend their assumptions regarding the ability of the relevant staff to perform under the expected conditions. Accordingly the subjective nature of this NUREG will make successful implementation very difficult.
	Response		*The licensee may submit an analysis for a specific future OMA exemption or license amendment request and be expected to defend the assumptions for the time margin criterion, whether following the NRC reviewer approach intended by NUREG-1852 or an independently-developed one. The nuclear industry strongly objected to an "objective" time margin, so the rulemaking was relaxed to allow the licensee to develop its own estimates. This NUREG preserves the flavor of this decision, with the appendix only providing an example of what one panel attempted; the appendix is binding neither on the licensee nor the reviewer.*

#	Source/ Item	NUREG Section	Comment (Technical)
62	BWROG	Section 3	3.2.3, Paragraph 4: NRC should remove this paragraph. The statement referring to NUREG-0800 stating "Although this guidance addressing fire fighting, it is clear that some of these also be relevant to operator manual actions" is an interpretation of the guidance in NUREG-0800. Although it is understood that operator manual actions need to be demonstrated as feasible and reliable, this should not include meeting the guidance in NUREG-0800 regarding fire fighting activities, which involve potentially dangerous activities and activities resulting in potential water spray on plant equipment.
	Response		*There was never the intent that NUREG-0800 and its coverage of fire fighting activities was a basis for why environmental issues should be addressed in determining the feasibility and reliability of OMAs. This has been clarified in modified text to the NUREG that emphasize that (a) NUREG-0800 is not directly applicable to OMAs but that (b) to the extent OMAs may performed in locations where potential hazards may exist or specific access paths are recommended to deal with potential environmental concerns, some of this information could be found useful.*
63	BWROG	Section 3	3.2.3, last paragraph: This paragraph and references to inspection guidance in other paragraphs should be removed from Chapter 3. Inspection guidance is not part of regulation, nor is it subject to review in a similar way to other regulatory documents. Additionally, the inspection guidance should be based on existing regulation. As such, it is not a reasonable reference for providing a basis for requirements on operator manual actions. Finally, it is likely the current inspection guidance will be revised once NUREG-1852 is published, thus making the discussion inaccurate.
	Response		*Just as, over time, interpretations of requirements and regulations tend to become clearer and more consistent due to the application of the requirements or regulations in varying circumstances, including having certain precedents become established, the evolution of inspections and the accompanying inspection guidance continues to provide precedents and expectations with regard to criteria that should apply to OMAs. Hence, the inspection guidance will remain as a contributory aspect to the formation of the criteria. However, clarification is added to the NUREG where references are made to inspection guidance as a basis. The clarification is that inspections/inspection guidance is cited as simply a means to demonstrate that the criteria are not entirely new, but in fact already exist to some extent and are consistent with expectations and precedents already established with regard to fire inspections.*
64	BWROG	Section 3	3.2.5, Paragraph 4: As stated above, Inspection Guidance should not be listed as a reference for providing a list of requirements for operator manual actions. NRC should remove the inspection guidance references in *NUREG-1852.*
	Response		*See response to "BWROG Section 3" [Table Comment #19] with regard to section 3.*
65	NEI	3.2.4, p. 3-6 4.2.4, p. 4-6	The discussion of IN 92-18 in Sections 3.2.4 and 4.2.4 is focused on bypassing of motor-operated valve thermal overloads. The primary technical concern related to this IN in the industry is the potential bypassing of torque switch/limit switch protection and potential valve damage that could potentially inhibit remote or local operation.
	Response		*These discussions represent an illustration of the types of equipment and functionality concerns that may be pertinent to OMAs.*

#	Source/ Item	NUREG Section	Comment (Editorial)
66	BWROG	Section 1 (1)	Paragraph 2: The words "rather than on Fire Barriers or separation…" infer that plants are not using Fire Barriers or separation. These words should be modified to better describe the actual situation in the plants. We recommend removing the words from "rather than" to the next comma, since the wording does not add anything to the manual action discussion.
	Response		*Change made.*
67	BWROG	Section 1 (2)	Paragraph starting "If any one..." We recommend changing "contain no redundant" to "do not contain redundant." Since a III.G.1 fire area contains one of two or more trains, the wording needs to accurately reflect that multiple trains are not affected rather than any trains.
	Response		*Change made.*
68	BWROG	Section 3 (1)	Page 3-1, bullet 3: The operator feasibility criteria appear to require analysis of safe shutdown requirements. In fact, the operator feasibility analysis supports the safe shutdown analysis, not the reverse. NRC should reword the bullet to clarify that the additional requirements listed are needed for feasibility, and are part of the demonstration that cables and equipment required for safe shutdown are not damaged by a fire.
	Response		*The NUREG does not provide requirements. Its intent is to support NRC staff reviews of OMAs (via future exemptions or license amendment requests), not licensee SSD analyses. However, the text has been changed slightly to emphasize we are talking about the functionality of equipment and cables needed to be able to implement the operator manual actions (OMAs). [We are not talking about the entire set of safe shutdown requirements as addressed by SSD analyses. Clearly, to the extent SSD analyses have already addressed the equipment needed to conduct the OMAs, they provide analysis/documentation that the appropriate equipment and cables will be functional].*
69	BWROG	Section 3 (2)	3.2.4: This section seems to require the verification that SSC are free of fire damage. This is already a requirement for the plant's fire Safe Shutdown Analysis, which was where the local manual action was likely identified. Requiring an additional verification that equipment is available would basically require a SSA supporting the operator manual actions. NRC should reword this section to focus on the requirement the equipment needed to be manipulated be accessible, and remove any statement requiring additional verification that the equipment is available.
	Response		*The NUREG does not present requirements, but provides one set of guidance for NRC staff may use when evaluating the feasibility and reliability of OMAs (via future exemptions or license amendment requests). The concern in the NUREG, for instance, is component damage resulting from a spurious operation or maloperation (e.g., a licensee must ensure that an MOV does not over torque) so that it can not be manipulated per the needs of the OMA. We changed the text to emphasize we are talking about the condition of the equipment needed to be able to implement the OMAs. [We are not talking about the entire set of safe shutdown requirements as addressed by SSD analyses. Clearly, to the extent SSD analyses have already addressed the equipment needed to conduct the OMAs, they provide analysis/documentation regarding the condition of the equipment that may be need to implement OMAs].*

#	Source/ Item	NUREG Section	Comment (Editorial)
70	BWROG	Section 3 (3)	3.2.9: The paragraph starting "Analogous…" requires an assessment of several things. • First, alarm effectiveness, although interesting in a risk-informed approach (for actions where the operator failure rates are as reliable as typical alarm circuits), is neither presently required nor of interest in assessing feasibility or reliability. Additionally, there is no similar requirement for other operator actions, such as for emergency response for a design basis accident. For these types of actions, the requirements are to ensure the alarm remains operable, but there is no "assessment of effectiveness" which indicates a determination of the failure rate of the alarm. The requirements to assess effectiveness of an alarm should be removed. • Second, the paragraph requires the assessment of "each operator's knowledge of his or her role." Training requirements for all procedures require regular training and testing on procedural actions. However, this does not include the assessment for particular actions on each operator's knowledge. Assessment would seem to indicate again a determination of failure probability, rather than the present requirement of having an approved training program (with all of the required program attributes). The requirements should be reworded to assess each operator's knowledge on his or her role. • Finally, the last requirement is an assessment that the procedure is current and adequate. While procedures have to be current, a separate assessment should not be required here. Self-assessments and other audits look at this issue extensively. Determining whether a procedure is adequate is subjective, and it would be difficult to assess this. Procedures are required to go through an extensive review, and adequacy would be determined by both the programmatic requirements as well as the required walkthroughs of the procedural actions by each crew. Therefore, a separate assessment is not needed, and the requirement to ensure a procedure is current and adequate should be removed.
	Response		*The NUREG presents information, not requirements. As such, we have gone through the entire document to replace terminology indicating requirements with terminology consistent with technical review (e.g., "should", "consider"). The analyst should assess these items (i.e., alarm effectiveness, role of personnel performing the OMA, procedures) in the context of crediting OMAs in response to fires in lieu of physical separation criteria. These assessments ensure that the alarms, personnel, and procedures, etc., can all work effectively, together, in the specific context of the particular fire scenario(s) within which the OMAs will be credited. For example, though the licensee will have verified and validated procedures as part of their procedures development program, the procedures may not have been exercised under the unique conditions presented by the fire scenario(s) for which the OMA may be needed. Additional procedure assessment under these unique conditions could reveal previously unidentified shortcomings. Alarm "effectiveness" goes beyond the concept of operability and, in fact, presumes the alarm works. What it addresses is whether or not the alarm is "effective" in communicating its intention to the operator(s) for different fires and their locations. This is a human factors concern and something that, in a risk-informed approach (not the subject of this document), would be considered as part of the HRA. It is appropriate to retain the discussion as provided in the NUREG because they are considerations for both feasibility and reliability of a manual action. Similar comments apply to the other two bullets, in that these are all factors to be considered in the operator response (best accounted for through HRA, if performing risk-informed analysis) and, therefore, important to feasibility and reliability. We have added clarifying text indicating that we fully expect existing programs will address much of this - but here, the focus is on those unique aspects because this is in response to fires as opposed to other types of plant challenges.*
71	NEI #19	Glossary, p. xi	Editorial clarification. Abbreviation for 'American Nuclear Society' should be ANS not ANSI.
	Response		*Change made.*

#	Source/ Item	NUREG Section	Comment (Editorial)
72	BWROG	Section 4 (1)	4.2.6 General: It is common to have communications performed prior to putting on protective gear with confirmation given once the operator has left the area and removed the gear. This possibility should be allowed, given the timeline for actions and verification allow for this. In most cases, once the action is complete, the protection to the core is provided so that the verification and communication back to the control room does not affect the overall fire and plant risk.
	Response		*It is expected that the licensee will follow normal procedures or planned protocols for communicating among the plant staff as necessary. The intent here is to recognize that the unpredictable nature of fires could require, for instance, communication with the protective gear being worn. If not addressed in the demonstration (for feasibility), this possibility should be considered as one of the uncertainties in the time margin (for reliability) if the OMA requires the donning of protective gear. Text has been changed to emphasize that this applies to the extent that the form of the communication needed to perform the OMA(s) needs to be similarly protected. If for instance, communication is going to be done by runners or performed before protective gear needs to be put on, clearly, certain aspects of the discussion are not applicable.*
73	TVA #6	Section 4.2.6	Additional guidance should be provided relative to "adequate communication." For example, for actions occurring after some point into the event, it is not unreasonable to utilize such alternate communication methodologies as runners, provided immediate two-way communications are not necessary.
	Response		*The NUREG is not intended to address this detailed level of communication, which appears to be highly plant-specific. However, the intent is not to rule out various strategies to address the situation, but rather to ensure that the strategies are evaluated in the context of the fire. For example, if "runners" are used in lieu of other forms of communication equipment, and they can be used effectively, that appears acceptable. Analysts just need to ensure that any potential problems associated with using runners are addressed and accounted for in some way, e.g., as one of the uncertainties in the time margin. The text has been changed to recognize this guidance applies to the extent the form of the communication needed to perform the operator manual action(s) needs to be similarly protected. If for instance, communication is going to be done by runners or performed before protective gear needs to be put on, clearly, certain aspects of the guidance are not applicable. The licensee may wish to credit the specific form of communication to be used in its future OMA exemption request, and the NRC staff would review on a plant-specific basis.*
74	BWROG	Section 4 (2)	4.2.11, bullet 2: The wording is vague: "… many steps… that require careful thought..." The NRC should indicate which steps require careful thought. 4.2.11, bullet 4: NRC should remove this bullet as it may be interpreted to apply to all actions. All emergency actions require a high degree of mental effort.
	Response		*Change made - bullets deleted. Similar changes made to section 3.2.11 of the NUREG.*
75	BWROG	Section 4 (3)	4.2.11.7. Last Paragraph: The guidance here, to consider when a crew has received training, goes against previous guidance to randomly select the crew. The last sentence indicating not automatically using the latest trained crew is reasonable, but if a crew selection is truly random, then this process should not try to include other aspects.
	Response		*The main point being made is that pre-conditioning should not be performed, but it is expected that all crews will have received training, and one of these crews should be randomly selected. Should the licensee choose not to train all crews, they run the risk of a poor demonstration if the randomly selected crew is not trained. Also, failure to train all crews would increase uncertainty in human performance, requiring additional time in the time margin because of the possibility of an "untrained" crew being on call when a fire occurs. Text changed to only emphasize that pre-conditioning should not be performed.*

#	Source/ Item	NUREG Section	Comment (Editorial)
76	NEI #31	3.2.5, p.3-7	The NRC's feasibility and reliability criteria on page 3-1 requires: • Indications necessary to show the need for the manual actions, enable their performance, and verify their successful accomplishment. • Necessary communications Section 3.2.5 Available Indications states: *"In addition to the SSC needed to directly perform the desired functions, the equipment needs to include diagnostic indications relevant to the desired operator manual actions. These indications are needed to (1) enable the operators to determine which manual actions are appropriate for the fire scenario, (2) direct the personnel performing the manual actions, and (3) provide feedback to the operators to verify that the manual actions have had their expected results and will remain in that state. These indications include those necessary to detect and diagnose the location of the fire."* COMMENT: For most preventive actions, the only indication needed is the fire alarm; indications to verify successful accomplishment may not be needed (for instances, tripping a breaker to remove power, manually positioning a valve using the hand wheel, pulling fuses to fail a component in it's required position, etc.) may not be required and direct indication of some of these actions may not be possible (i.e., tripping the breaker to a MOV removes the control power for the indicating lights, pulling fuses may also remove power from indicating lights). Also, communications (other than face-to-face) in the main control room (MCR) may not be required; the operator may be directed to perform the action(s) and report back to the MCR after completing the task(s). Thus, diagnostic instrumentation and/or communications may not be required for preventive actions.
	Response		*This NUREG addresses only manual actions outside the MCR. Criteria for available indications, communications, special equipment, etc., reflect the possibility that specific manual actions may incorporate some or all of these to varying degrees, based on the nature of the action (simple, complex, sequential, concurrent, etc.). The criteria are meant to cover all possibilities. It is recognized that some criteria (e.g., special equipment) may have no role to play for certain manual actions. See responses to "BWROG Section 4(1)" comment (Table Comment #72) with regard to 4.2.6, as well as "TVA #6" comment (Table Comment #73) for examples of changes made relative to the communications issues. As for the indications, it is recognized that the indications needed will vary (e.g., preventive action may only need the fire alarm). The same is true for feedback indication since, for instance, the opening of a breaker drawer needs no other indication that the breaker is no longer functional. For such cases, just to be clear, we have added text indicating we are talking about when indication of the completed action is not already directly observable. In addition, in Sections 3 and 4 of the NUREG, we have gone through each criterion and added/changed text, where appropriate, to reflect that it applies to the extent appropriate (e.g., such a phrase was already included in section 4.2.5), recognizing that specific manual actions may need to meet the guidance to varying degrees.*
77	NEI #32	3.2.6, p. 3-8 4.2.6, p. 4-8	Sections 3.2.6 and 4.2.6 address communications related to feasibility and reliability of operator manual actions. The actions imply that protection of communications equipment is necessary to demonstrate that the ability to communicate effective operator manual action accomplishment. There is no regulatory requirement or industry precedent to protection communications equipment and cabling from the effects of fire. There should be flexibilities in approaches to demonstrate that operators can effectively communicate during post-fire safe shutdown. For example, some sites have evaluated their communication needs, and concluded that "face to face" communication is sufficient, based on the nature of the actions and the time available to perform them.
	Response		*Clarification has been made to the text. See responses to "BWROG Section 4(1)" comment (Table Comment #72) with regard to 4.2.6, as well as "TVA #6" comment (Table Comment #73).*
78	NEI #26	2, p. 2-1	Editorial, last sentence page 2-1 should be "….Paragraphs III.G.2 and III.G.3."
	Response		*Editorial change made.*

#	Source/ Item	NUREG Section	Comment (Editorial)
79	NEI #34 *Response*	3.2.10, p. 3-12	The sentence beginning, "In other words, …" seems to imply that a plant operator can no longer serve on the fire brigade as a "collateral duty during a fire." *That operator should not serve as both a Fire Brigade member and be responsible to perform an OMA during a fire at the same time, i.e., (s)he should not serve both functions concurrently. (S)He could serve as a Fire Brigade member on shift provided another operator had his/her manual action responsibility that same shift. An individual who could be called upon to perform OMAs should not also be a member of the Fire Brigade or have other collateral duties that could interfere with his/her ability to perform the OMA. This does not mean that (s)he may not have any other duties during the fire, but only that those duties should not supercede or interfere with his/her ability to conduct the OMAs. This further clarification has been added to both sections 3.2.10 and 4.2.10 of the NUREG.*
80	NEI #44 *Response*	Appendix B, p. B-11	Editorial clarification. First paragraph, second sentence: 'the MRC' should be 'the MCR'. *Editorial change made.*

#	Source/ Item	NUREG Section	Comment (Public)
81	NIRS	General	NIRS does not support the draft NUREG-1852 as it is currently intended and submitted by NRC. Rather than recover a regulatory strategy for effective oversight and meaningful enforcement action focused on maintaining a high assurance of post-fire safe shutdown of the nation's nuclear reactors, NUREG-1852 proposes a confusing, increasingly complicated, unreasonably high maintenance and dubious compliance strategy to exempt the industry from maintaining qualified passive fire protection features as intended by law. In the end, draft NUREG-1852 as written diminishes the defense-in-depth for fire protection of safe shutdown systems and increases the risks to the public's health, safety and security.
	Response		*The primary intent of NUREG-1852 is to provide information that the NRC Staff can use to review future exemptions or license amendment requests. NUREG-1852 will provide one coherent set of feasibility and reliability criteria, which enables the NRC staff to perform consistent reviews. NRC has no current plans to incorporate this NUREG into its regulations or inspection guidance. Inspectors may choose to become familiar with and expand their knowledge of feasibility and reliability criteria for operator manual actions through the NUREG. The NUREG does not change any regulatory requirements; however, it informs the NRC staff and the nuclear industry. Furthermore, as reiterated in RIS 2006-10, "Regulatory Expectations with Appendix R, III.G.2 Operator Manual Actions," with regard to regulatory requirements: "Paragraph III.G.2 of Appendix R does not list operator manual actions as a means of ensuring that one of the redundant trains is free of fire damage. Specifically, paragraph III.G.2 of Appendix R requires that ... one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided: (a) separation of cables and equipment by a fire barrier having a 3-hour rating, (b) separation of cables and equipment by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards and with fire detectors and an automatic fire suppression system in the fire area, and (c) enclosure of cables and equipment in a fire barrier having a 1-hour rating and with fire detectors and an automatic fire suppression system in the fire area." NRC staff intend to view future exemption requests for OMAs in light of the requirements for defense-in-depth as stipulated under compliance options (b) and (c) with regard to fire detectors and an automatic fire suppression system.*

#	Source/ Item	NUREG Section	Comment (Public)
82	NIRS	General	Draft NUREG-1852 does not address the central issue that the agency is unwilling or unable to demonstrate timely enforcement actions for long standing and willful violations of fire protection law to maintain circuit integrity/cable functionality for post-fire safe shutdown systems. The draft NUREG seeks to circumvent NRC's responsibility ... for requiring circuit integrity and cable functionality of safe shutdown systems be maintained to be free from fire damage ... These [preceding] examples offer ample proof that NRC has refused to take timely and effective enforcement action for significant, long standing and widespread violations of fire protection regulations potentially affecting the public health, safety and security. Adopting NUREG-1852 for broader applications of exemptions from Appendix R III.G.2 undermines future NRC staff and Commission credibility and authority for implementing corrective action programs and Confirmatory Orders resulting from further non-compliance from failure to implement guidance of NUREG-1852.
	Response		*The NRC has communicated its expectations with regard to compliance with Appendix R, III.G.2. As reiterated in RIS 2006-10: "The regulations in 10 CFR Part 50.48(b) impose the requirements of paragraph III.G.2 of Appendix R on plants licensed to operate before January 1, 1979 (pre-1979 licensees). As originally issued, 10 CFR 50.48, 'Fire Protection,' allowed licensees to request an exemption from compliance with one or more of the provisions of Appendix R if the licensee justified the exemption on the basis that the required modifications would not enhance fire protection safety in the facility or that the modifications might be detrimental to overall facility safety. The staff's current basis for approving an exemption is provided in 10 CFR 50.12 'Specific Exemptions.' In order for the NRC to approve such an exemption request, a licensee would have to identify all relevant credited operator manual actions by fire area or fire scenario. The NRC has reviewed and granted exemption requests for the use of operator manual actions in lieu of the separation criteria of paragraph III.G.2 where the exemption criteria were met. These exemptions are specific to the licensee and the situation discussed in the exemption. Exemptions granted for specific conditions cannot be applied under other conditions. Although the rationale for an exemption may appear to be applicable to a similar situation for a second licensee, the staff cautions that NRC review and approval by issuance of an exemption would be necessary for the second licensee. The appropriate regulatory vehicle (in the absence of a rulemaking or plant-specific Order) to provide dispensation from compliance with fire protection requirements is the issuance of an exemption under 10 CFR Part 50.12 ..." In the Federal Register, Vol. 71, No. 43, March 6, 2006, the NRC communicated its expectations with respect to Enforcement Action in connection with the withdrawal of the OMA rulemaking.*

#	Source/ Item	NUREG Section	Comment (Public)
83	NIRS	General	....[V]iolations evolved through the widespread deployment of unapproved and largely unanalyzed operator manual actions in lieu of maintaining qualified designs that incorporate passive physical fire protection features including operable fire barrier systems, automated fire suppression and detection systems and minimum cable separation requirements. NIRS contends that the draft NUREG seeks to set a dangerous precedent that ignores the agency's preference for maintaining post-fire safe shutdown circuit integrity and cable functionality to be free from fire damage following a significant fire. The NUREG threatens to reverse the order of how Fire-Safe-Shutdown (FSSD) analysis is conducted. ... [N]ow NRC, instead of prioritizing compliance with preferred passive physical fire protection features as specified under Branch Technical Position 9.5-1 and 10 CFR 50 Appendix R III.G.I or III.G.2, NIRS contends the draft NUREG is attempting to allow industry a compliance strategy through the submission of a massive number of exemptions under 10 CFR 50 Appendix R through the employment of a complicated array of numerous dubious operator manual actions ... Licensees have already demonstrated widespread difficulty in adequately analyzing operator manual action. NUREG-1852 would allow the nuclear industry to avoid compliance and NRC to avoid enforcement action for duly promulgated law by trivializing the prioritization of physical fire protection features and instead unduly promote the abuse of the exemption process from requirements for the physical protection of circuit integrity and cable functionality for post fire safe shutdown systems.
	Response		*The NRC's expectations for compliance have not changed, but these expectations are not within the scope of NUREG-1852 (see instead RIS 2006-10, "Regulatory Expectations with Appendix R, III.G.2 Operator Manual Actions"). The NUREG provides one set of criteria for the NRC staff to use when determining feasibility and reliability during reviews of future exemptions or license amendment requests for operator manual actions. As reiterated in RIS 2006-10: "The staff's current basis for approving an exemption is provided in 10 CFR 50.12 'Specific Exemptions.' In order for the NRC to approve such an exemption request, a licensee would have to identify all relevant credited operator manual actions by fire area or fire scenario. The NRC has reviewed and granted exemption requests for the use of operator manual actions in lieu of the separation criteria of paragraph III.G.2 where the exemption criteria were met. These exemptions are specific to the licensee and the situation discussed in the exemption. Exemptions granted for specific conditions cannot be applied under other conditions ... The appropriate regulatory vehicle (in the absence of a rulemaking or plant-specific Order) to provide dispensation from compliance with fire protection requirements is the issuance of an exemption under 10 CFR Part 50.12. Inspection reports, meeting minutes, and letters from licensees are examples of documents that do not provide dispensation from compliance with applicable fire protection requirements. For pre-1979 licensees, a staff decision in a safety evaluation report (SER) that approves the use of operator manual actions, in lieu of one of the means specified in paragraph III.G.2, does not eliminate the need for an exemption. Pre-1979 licensees who have SERs, but not a corresponding exemption, which approve manual actions should request an exemption under 10 CFR Part 50.12, citing the special circumstances of section 50.12(a)(2)(ii), citing the SER as the safety basis, and confirming that the safety basis established in the SER remains valid. The staff expects to grant the exemption on these bases without further review ... Since plants licensed to operate on or after January 1, 1979 (post-1979 licensees), are not required to meet the requirements of paragraph III.G.2, a staff decision in an SER that approves the use of manual operator actions does not require exemption under 10 CFR 50.12. Post-1979 licensees may be requested to demonstrate, as part of the NRC Reactor Oversight Process, that the use of an operator manual action would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire consistent with their license." A successful exemption typically requires more stringent measures than the standard compliance provisions since the exemption, by its very nature, is substituting for a compliance provision.*

#	Source/ Item	NUREG Section	Comment (Public)
84	NIRS	General	Time factors incorporated into the NUREG-1852 guidance do not adequately address or incorporate all impacts of environmental conditions associated with fire. NIRS contends that Criterion 4.2.2 "Guidance Regarding the Analysis showing Adequate Time Available to Ensure Reliability" does not adequately address the reliability of the operator manual actions ... Only in Appendix B "Summary of Expert Opinion Elicitation to Determine Time Margins for Operator Manual Actions in Response to Fire" in section B.2.2.3 "What Are the Human Performance Influences That Should Be Accounted for by the Time Margins?" does the NUREG scantily address the need to account for time margins for variability in human performance issues such as "visibility problems due to smoke that is worse than assumed for the location of a given set of actions.'" This is a key example of the broad unpredictability, uncertainty and difficulty that exists in attempting to incorporate all reasonable assumptions on environmental conditions associated with fire, in this case namely thick smoke and its impact on visibility and human performance.
	Response		*The NRC contends that the demonstration and time margin approach can adequately address all impacts of environmental conditions associated with fire. Section 4.2.2 (Item 4) provides guidance for ensuring "that additional uncertainties in the estimate of the time required to implement the manual action (listed below) are accounted for in the analysis before the final determination is made that adequate time exists for the manual action." The items referred to as "listed below" include (among several others): "Environmental and other effects ... that are not easily simulated in the demonstration, such as radiation [e.g., the fire could reasonably damage equipment in a way that radiation exposure could be an issue in the location in which the action needs to be taken, causing the need to don personnel protection clothing (which takes extra time), but which may not be included in the demonstration]; smoke and toxic gas effects (these are not likely to be actually simulated in the demonstration, but in a real fire where the manual action needs to be taken near the fire location but in a separate room, there may be smoke and gas effects that could slow the implementation time for the action)." Also included is the potential need to don and wear SCBAs. In addition, Section 4.2.3 provides more discussion on environmental conditions to be considered. Thus, the guidance indicates that such factors should be explicitly considered in estimating the time margin needed to ensure reliability. Although two options are offered in Section 4.2.2 for accounting "for these additional uncertainties associated with the time required for the manual action," both indicate that it should be shown that the additional uncertainties are enveloped by the time available. In addition, in Section 3.1, as part of the "NRC's feasibility and reliability criteria for operator manual actions," it is stated that: "The analysis should show that the actions can be performed under the expected environmental factors that will be encountered." Thus, the actions cannot be credited without an expectation that the conditions generated by the fire will allow them and Section 4.2.3 discusses the range of uncertainties associated with environmental conditions that needs to be covered by the time margin..*

#	Source/ Item	NUREG Section	Comment (Public)
85	NIRS	General	NUREG-1852 does not account for adequate mitigating responses to aircraft impacts and other forms of terrorist attack that might result in multiple large fires. The Commission has taken the precarious position that nuclear power plant operators can and will rely on mitigation efforts to control and contain the consequences of a successful terrorist attack resulting in a significant fire or fires. The known broad non-compliances with qualified physical fire protection features for safe shutdown do not lend public confidence to these assertions. Moreover, excerpts from the Argonne Aircraft Hazards Evaluation (NUREG/CR-2859) do not lend credibility to these same assertions. Argonne states "Based on the review of past licensing experience, it appears that fire and explosion hazards have been treated with less care than the direct aircraft impact and the resulting structural response. Therefore, the claim that these fire/explosion effects do not represent a threat to nuclear power plant facilities has not been clearly demonstrated." The Commission more recently rejected revising the Design Basis Threat to protect nuclear power plants from potential attacks by terrorists using aircraft and the associated risks from fire and explosion identified in NUREG/CR-2859. The dubious rejection of such protective actions in light of identified deficiencies increases the controversy that surrounds the Commission efforts to abandon enforcement of qualified physical fire protection features for maintaining safe shutdown by allowing for the substitution of broader applications of operator manual actions.
	Response		*The NRC recognizes that NUREG/CR-2859 was published many years before September 11, 2001. Since then, the threat environment has changed, and the NRC has reevaluated this issue. As discussed in the Federal Register section entitled Design Basis Threat (72 FR 12705; March 19, 2007), as part of a larger NRC effort to enhance the safety and security of the Nation's nuclear power plants, an initiative was undertaken as part of a February 2002 NRC Order. The order required licensees to look at what might happen if a nuclear power plant lost large areas due to explosions or fires. The licensees then were required to identify and later implement strategies that would maintain or restore cooling for the reactor core, containment building, and spent fuel pool. The requirements listed in Section B.5.b of this Order directed licensees to identify "mitigative strategies" (meaning the measures licensees could take to reduce the potential consequences of a large fire or explosion) that could be implemented with resources already existing or "reliably available." The NRC held inspections in 2002 and 2003 to identify if licensees had implemented the required mitigative strategies. These inspections, as well as additional studies, showed significant differences in the strategies implemented by plants. As a result, the NRC developed additional mitigative strategy guidance. The guidance was based on "lessons learned," from NRC engineering studies and included a list of "best practices" for mitigating losses of large areas of the plant. The NRC inspected each plant in 2005 to review their implementation of any additional mitigative measures. The NRC is continuing to ensure licensees appropriately implement these measures.* *Aircraft attack, in particular, was also considered and studies analyzing the consequences of successful commercial airline attacks were performed. For the facilities analyzed, the studies found that the likelihood of both damaging the reactor core and releasing radioactivity that could affect public health and safety is low. Even in the unlikely event of a radiological release due to terrorist use of a large aircraft, there would be time to implement mitigating actions and off-site emergency plans such that the NRC's emergency planning basis remains valid (71 FR 36554; June 27, 2006). Additional site-specific studies of operating nuclear power plants are underway or being planned to determine the need, if any, for additional mitigating capability on a site-specific basis.*

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