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BACKGROUND

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OBJECTIVE

Present Interim Feasibility Criteria and Bases
Receive Public Feedback

BACKGROUND

- 10 CFR 50.48 imposed fire protection (FP) requirements from App. R, Paragraph III.G.2, to pre-1/1/1979 licensed plants
  - Three acceptable methods to protect at least one shutdown train during a fire when redundant trains are located in same fire area
    - 3-hr passive fire barrier
    - 20-ft separation and no intervening combustibles, with fire detection and automatic suppression
    - 1-hr passive fire barrier with fire detection and automatic suppression

BACKGROUND (continued)

- For post-1/1/1979 licensed plants, App. R provisions were incorporated into Branch Technical Position (BTP) CMEB-9.5-1 and NUREG-0800 (Standard Review Plan)
  - Plant-specific FP programs and commitments were reviewed against one of these, becoming part of the post-1/1/1979 plant licensing bases (thereby incorporating the provisions of App. R, Paragraph III.G.2)

BACKGROUND (continued)

- Since mid-1990's, NRC inspections of licensee FP programs have indicated many instances of reliance on "operator manual actions" rather than the accepted protective provisions of III.G.2
  - Unless approved as an "exemption" (pre-1/1/1979 plant) or "deviation" (post-1/1/1979 plant), such actions do not comply with III.G.2 [Committee to Review Generic Requirements, May 2002]

BACKGROUND (continued)

- More importantly, some of these "operator manual actions" may not have been feasible, thereby creating doubt that safe shutdown could be assured
- NRC and nuclear industry agreed to suspend debate over past history and focus on regulatory action that would permit these actions **provided their feasibility could be assured**

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BACKGROUND (continued)

- In March 2003, NRC issued FP Inspection Procedure, Attachment 71111.05, Enclosure 2 – *Inspection Criteria for FP Manual Actions*
  - "For an interim period, while rulemaking is in progress ... acceptance criteria can be developed which would facilitate evaluations of certain manual actions."

BACKGROUND (continued)

- March 2003 inspection criteria were based on NRC inspection experience and addressed the following
  - Diagnostic Instrumentation
  - Environmental considerations
  - Staffing and Training
  - Communications and Accessibility
  - Procedures
  - Verification and validation

BACKGROUND (continued)

- In June 2003, NRC issued SECY-03-0100, *Rulemaking Plan on Post-Fire Operator Manual Actions*
  - "... [T]here is insufficient evidence that the generic use of these actions poses a safety issue ... that requires prompt action ... [E]nforcement may not be the best remedy ... [because] ... [l]icensees ... might flood the NRC with exemption or deviation requests, which could divert NRC resources ..."

BACKGROUND (continued)

- SECY-03-0100 (continued)
  - "... To resolve the regulatory compliance issue, the staff ... has concluded that generic guidance and acceptance criteria for feasible operator manual actions should be developed ... Documenting compliance ... would demonstrate that safety has been maintained and that the operator manual actions do not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire."

BACKGROUND (continued)

- SECY-03-0100 (continued)
  - "Even with Commission consent to proceed with rulemaking, licensees using unapproved operator manual actions would be in non-compliance ... Upon receiving Commission approval of the ... rulemaking plan, the staff will develop an interim enforcement policy to allow discretion, ... provided these licensees have documented the feasibility ... in accordance with the staff's proposed preliminary generic acceptance criteria."

BACKGROUND (continued)

- In September 2003, the Commission issued a Staff Requirements Memorandum (SRM) on SECY-03-0100 approving "the staff's recommendation to proceed with rulemaking ... to revise the FP program requirements contained in Appendix R of 10 CFR Part 50 and the associated guidance."

BACKGROUND (continued)

- SRM on SECY-03-0100 (continued)
  - "... [T]he Commission has approved the staff's plan to develop an interim enforcement policy to deal with these compliance issues ... The staff should leverage its past experience to develop the general acceptance criteria and expedite this rulemaking effort."
    - NRC staff position
      - Use existing March 2003 inspection criteria as basis for interim feasibility criteria

BACKGROUND (continued)

- SRM on SECY-03-0100 (continued)
  - "... The interim enforcement policy ... in no way obviates the need for licensees to continue documenting the technical feasibility of their operator manual actions."
    - NRC staff position
      - Technical feasibility of operator manual actions remains paramount
      - Develop additional criteria as appropriate to assure technical feasibility

OBJECTIVE

Present Interim Feasibility Criteria and Bases

Receive Public Feedback

INTERIM FEASIBILITY CRITERIA FOR OPERATOR MANUAL ACTIONS

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DEFINITIONS

- Operator manual actions
  - Those actions taken by operators to perform manipulation of components and equipment from **outside the main control room** (MCR) to achieve and maintain post-fire safe shutdown. These **actions are performed locally by operators, typically at the equipment.**

DEFINITIONS (continued)

- Operator actions
  - Those actions taken by operators from **inside the MCR** to achieve and maintain post-fire safe shutdown. These actions are typically performed by the **operator controlling equipment located remote from the MCR.**
- Feasibility criteria apply only to operator **manual** actions, i.e., ones taken outside the MCR, not operator actions (inside the MCR)

BASES

- Feasibility criteria used in NRC Inspection Manual Chapter 609, *Significance Determination Process*
  - Consistent with Remote Location Manual Actions Evaluation Table in revised FP SDP
- Feasibility criteria from March 2003 NRC FP Inspection Procedure, Attachment 71111.05, Enclosure 2 – *Inspection Criteria for FP Manual Actions*

BASES (continued)

- Input from RES-sponsored study by Sandia, JCN W6994 Draft Letter Report, *Risk Insights Related to Post-Fire Operator Manual Actions*
- Feedback from September 2003 meeting with ACRS Sub-committee on FP
- Feasibility criteria correspond to Performance Shaping Factors used in Human Reliability Analysis techniques

FEASIBILITY CRITERIA

- Available indications (formerly Diagnostic Instrumentation)
  - Diagnostic indication, if credited to support operator manual actions, shall be capable of
    - Confirming that the action is necessary;
    - Being unaffected by the postulated fire;
    - Providing a means for the operator to detect whether spurious operation of safety-related equipment has occurred; and
    - Verifying that the operator manual action accomplished the intended objective.

FEASIBILITY CRITERIA (continued)

- Environmental considerations
  - Environmental conditions encountered while accessing and performing operator manual actions shall be demonstrated to be consistent with the following human factor considerations for visibility and habitability
    - Fire effects shall be evaluated to ensure that smoke and toxic gases from the fire do not adversely affect the capability to access the required equipment or to perform the operator manual action.

FEASIBILITY CRITERIA (continued)

- Environmental considerations (continued)
  - Temperature and humidity conditions shall be evaluated to ensure that temperature and humidity do not adversely affect the capability to perform the operator manual action. [See, e.g., NUREG/CR-5680, vol. 2, *The Impact of Environmental Conditions on Human Performance*; or require that licensee provides rationale for temperature/humidity not being factors adversely affecting performance.]

FEASIBILITY CRITERIA (continued)

- Environmental considerations (continued)
  - Radiation shall not exceed 10 CFR Part 20, Section 20.1201, limits.
  - Emergency lighting shall be provided as required in Appendix R, Section III.J, or by the licensee's approved fire protection program, [e.g., lit with 8-hr battery-backed emergency lighting], and sufficient lighting shall be provided for paths to and from locations requiring any actions.

FEASIBILITY CRITERIA (continued)

- Staffing and Training (formerly separate criteria)
  - There shall be a sufficient number of plant operators, under all staffing levels, to perform all of the required actions in the times required for a given fire scenario. The use of operators to perform actions shall be independent from any collateral fire brigade or control room duties they may need to perform as a result of the fire.

FEASIBILITY CRITERIA (continued)

- Staffing and Training (continued)
  - Operators required to perform the manual actions shall be qualified and continuously available to perform the actions required to achieve and maintain safe shutdown. A training program on the use of operator manual actions and associated procedures during a postulated fire shall demonstrate that operators can successfully achieve these objectives.

FEASIBILITY CRITERIA (continued)

- Communications
  - To achieve and maintain safe shutdown, adequate communications capability shall be demonstrated for operator manual actions that must be coordinated with other plant operations, with this communications capability continuously available.

FEASIBILITY CRITERIA (continued)

- Special equipment (formerly Special tools)
  - Any special equipment required to support operator manual actions, including keys, self-contained breathing apparatus (SCBA), and personnel protective equipment, shall be readily available, easily accessible and demonstrated to be effective.

FEASIBILITY CRITERIA (continued)

- Procedures
  - Procedural guidance on the use of required operator manual actions shall be readily available, easily accessible and demonstrated to be effective.

FEASIBILITY CRITERIA (continued)

- Local accessibility (formerly Accessibility)
  - All locations where operator manual actions are performed shall be assessed as accessible without hazards to personnel, with controls needed to assure availability of any special equipment, such as keys or ladders, being demonstrated.

FEASIBILITY CRITERIA (continued)

- Demonstration (formerly Verification and validation)
  - The capability to successfully accomplish required operator manual actions within the time allowable using the required procedures and equipment shall be demonstrated using the same personnel/crews who will be required to perform the actions during the fire; documentation of the demonstration shall be provided.

FEASIBILITY CRITERIA (continued)

- Complexity and number (new criterion)
  - The degree of complexity and total number of operator manual actions required to effect safe shutdown shall be limited such that their successful accomplishment under realistically severe conditions is assured for a given fire scenario. The need to perform operator manual actions in different locations shall be considered when sequential actions are required.

FEASIBILITY CRITERIA (continued)

- Complexity and number (continued)
  - Analyses of the postulated fire time line shall demonstrate that there is sufficient time to travel to each action location and perform the action required to support the associated shutdown function(s) such that an unrecoverable condition does not occur.

FEASIBILITY CRITERIA (continued)

- Equipment pre-conditions (new criterion)
  - Possible failure modes and damage that may occur to equipment used during a fire shall be considered to the extent that the equipment's subsequent use could be prevented, or at least made difficult. Credit for using equipment whose operability may have been adversely affected by the fire due to smoke, heat, water, combustion products or spurious actuation effects shall account for such possibilities (e.g., over-torquing an MOV due to a spurious signal, as discussed in Information Notice 92-18).

PATH FORWARD

- Develop final feasibility criteria for operator manual actions considering additional input from
  - Office of Nuclear Regulatory Research
  - Office of Enforcement
  - Advisory Committee on Reactor Safeguards
    - FP Sub-committee
  - External stakeholders
    - Public
    - Industry

Outline for NFPA 805 SOC Completion

1. What is NFPA 805, what does it do, how does it work?
    a. consensus standard; voluntary standard
    b. standard for fire protection for any operational mode or plant configuration
    c. specifies minimum fire protection requirements
    d. requires a core of fundamental fire protection elements and design requirements
    e. allows performance-based or deterministic approaches to meet fire protection performance criteria

2. What does NFPA 805 require a licensee to do?
    a. comply with Chapter 1 performance goals, objectives, and criteria for any operational mode or plant configuration
    b. establish the fundamental fire protection program in Chapter 3
    c. identify fire areas and SSC's required to meet performance criteria
    d. apply perf-based or det. approach to demonstrate that perf-criteria are met
    e. in the event a licensee makes changes to the plant, he evaluates that changes in risk are acceptable, verify safety margin and DID are acceptable
    f. document results, ensure quality of analyses, maintain configuration control

3. Discuss relationship to NRC requirements i.e. GDC 3, 50.48, and Appendix R. NFPA 805 is an alternative to 50.48(b). NFPA 805 uses performance-based approaches and risk information. NRC has established acceptable risk criteria in RG 1.174. Make clear the relationship to pre-1979 and post-1979 plants. Justify PB approaches in 805 but at a low level. State that the PB approaches are acceptable to NRC (SECY-00-191) and that the use of risk is acceptable to NRC (RG 1.174)

4. Evaluate the acceptability of NFPA 805.
    a. discuss GDC-3 and 50.48(a); license conditions (pre-79/post-79). Evaluate acceptability versus 50.48(b).

5. Discuss why NFPA 805 is acceptable versus existing fire protection requirements. (Show similarities to 805 and demonstrating that any differences are acceptable.)
    a. e.g. administrative controls, water supply, distribution system, fire brigade
    b. regulatory positions (RG 1.189) for an acceptable fire protection program

6. Discuss differences from existing requirements and why these are acceptable. (ID all of 50.48(b) and App. R differences with 805.)
    a. e.g., emergency lighting, cold shutdown, alternative shutdown capability

7. Summary - proper implementation of the NFPA 805 approach ensures an acceptable FP program that meets GDC-3 and 50.48(a). The performance-based approaches of NFPA 805 provide an acceptable alternative to 50.48(b).

8. Bases for the exceptions, method for adoption of NFPA 805 (c.3.i. process; OGC mentioned Perry), and method to obtain approval for alternatives to compliance stated in the rule.